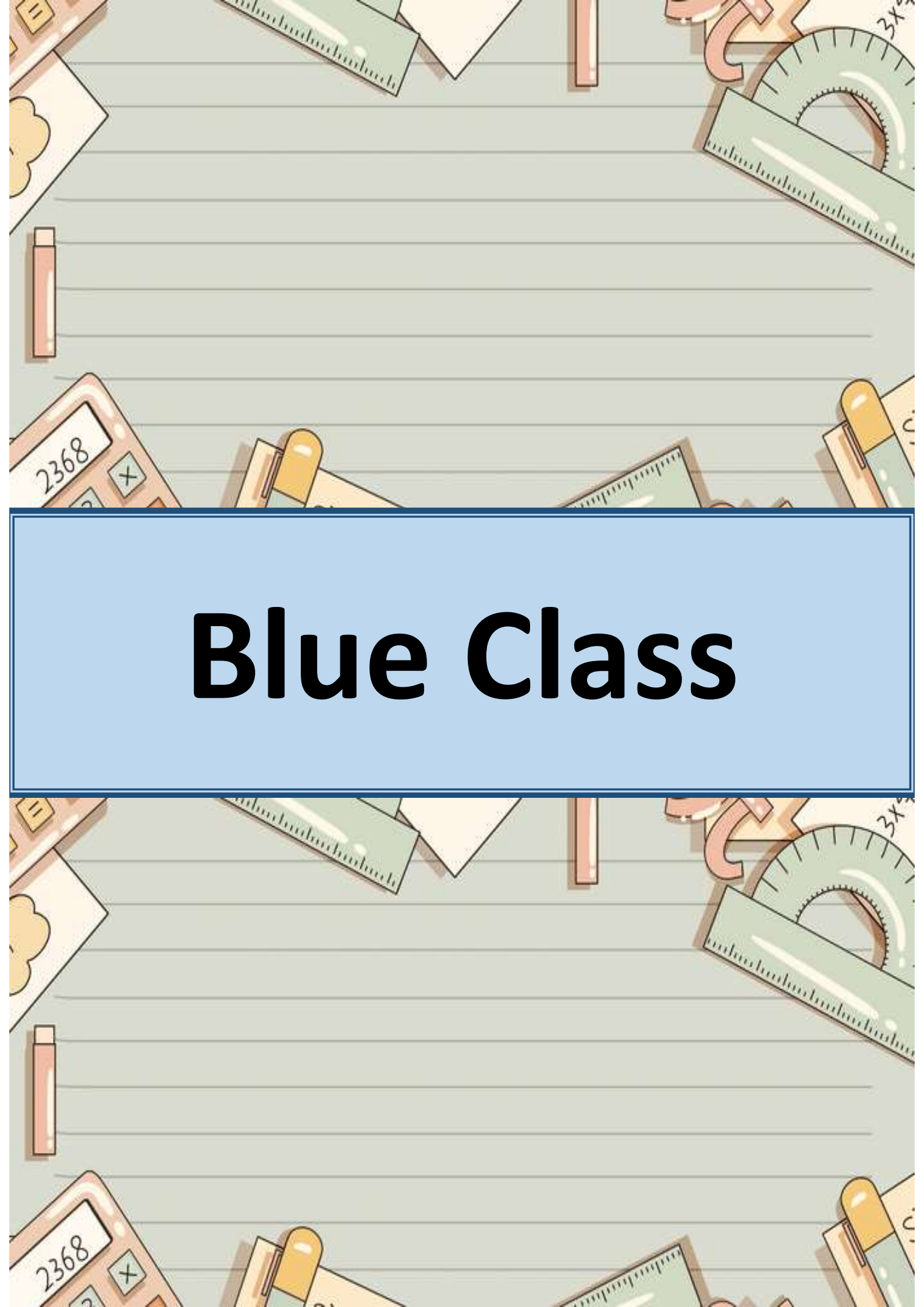
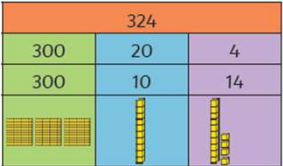
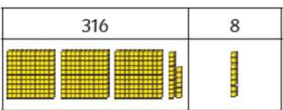
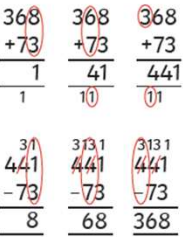
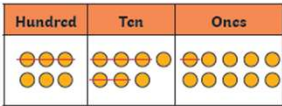
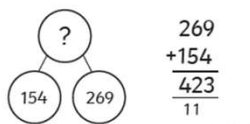
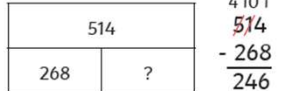
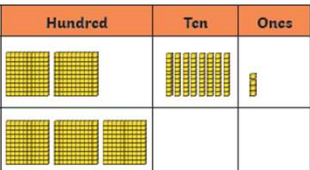
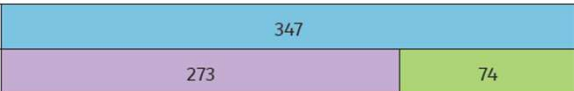
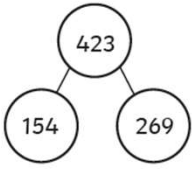


The background of the page is a light gray surface with horizontal lines, resembling a notebook. It is decorated with various school supplies: a green ruler, a protractor, a calculator showing '2368', a pencil, a paperclip, and a small notepad with a cloud drawing. These items are scattered around the edges of the page.

# Blue Class

# Addition and Subtraction: Stage 3

| Addition and Subtraction                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                         | Knowledge Organiser                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |  |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
| <b>Key Vocabulary</b><br>add<br>total<br>plus<br>sum<br>more<br>altogether<br>difference<br>subtract<br>less<br>minus<br>take away<br>column addition<br>column subtraction<br>exchange<br>estimate<br>inverse operation<br>solve problems<br>number facts<br>place value                                                                                                                                                                                                                                              | <b>Addition and Subtraction Methods</b> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |  |
| <b>3-digit and 1-digit numbers</b><br>Not crossing 10s<br>$268 - 4 = 264$<br><br>$343 + 6 = 349$<br><br>Crossing 10s (Exchanging)<br><br>$316 + 8 = 324$<br><br>$324 - 8 = 316$ |                                         | <b>3-digit and 2-digit numbers</b><br>Add and subtract tens<br><br>$451 + 3 \text{ tens} = 481$ ( $5 + 3 = 8$ )<br>$451 - 4 \text{ tens} = 411$ ( $5 - 4 = 1$ )<br>Crossing 10s (Exchanging)<br>$258 + 80 = 338$<br>• Column method<br>• Count in 10s mentally<br>• Add 100, subtract 20<br>Crossing 10 and 100<br>                     |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                         | <b>3-digit numbers</b><br>Not crossing<br>$679 - 351 = 328$<br><br>Crossing 10s (Exchanging)<br><br><br><b>Add and Subtract 100s</b><br>$284 + 300 = 584$<br> |  |

| Addition and Subtraction                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Knowledge Organiser |  |                   |                   |                   |                   |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|--|-------------------|-------------------|-------------------|-------------------|
| <b>Estimate</b><br>Estimate by dividing the hundred into 250 and 225.<br>Estimate 10s (330, 340) between 325 and 350.<br><br>Estimate $167 - 89$<br>Use near numbers $170 - 90 = 80$<br>Near numbers:<br> | <b>Check Answers</b><br><br>$347 - 74 = 273$ can be checked using<br>$273 + 74 = 347$<br>This part whole shows the inverse calculations using these three numbers.<br><br><table border="1"> <tbody> <tr> <td><math>154 + 269 = 423</math></td> <td><math>269 + 154 = 423</math></td> </tr> <tr> <td><math>423 - 154 = 269</math></td> <td><math>423 - 269 = 154</math></td> </tr> </tbody> </table> |                     |  | $154 + 269 = 423$ | $269 + 154 = 423$ | $423 - 154 = 269$ | $423 - 269 = 154$ |
| $154 + 269 = 423$                                                                                                                                                                                                                                                                                                                                                               | $269 + 154 = 423$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                     |  |                   |                   |                   |                   |
| $423 - 154 = 269$                                                                                                                                                                                                                                                                                                                                                               | $423 - 269 = 154$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                     |  |                   |                   |                   |                   |

# Addition and Subtraction: Stage 4

| Addition and Subtraction |                                                                                                                                                                                                               | Knowledge Organiser                                                                                                                                                                 |  |
|--------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
| Key Vocabulary           |                                                                                                                                                                                                               | Addition and Subtraction Methods                                                                                                                                                    |  |
| Add                      | <b>Add 4-digit numbers</b><br><br>No exchange<br><br>$\begin{array}{r} 5162 \\ + 3427 \\ \hline 8589 \end{array}$<br><br>Starting with the ones, add each column in turn.                                     | <b>Subtract 4-digit numbers</b><br><br>No exchange<br><br>$\begin{array}{r} 5789 \\ - 3421 \\ \hline 2368 \end{array}$<br><br>Starting with the ones, subtract each column in turn. |  |
| Total                    |                                                                                                                                                                                                               |                                                                                                                                                                                     |  |
| Plus                     |                                                                                                                                                                                                               |                                                                                                                                                                                     |  |
| Sum                      |                                                                                                                                                                                                               |                                                                                                                                                                                     |  |
| More                     | <b>One exchange</b><br><br>Starting with the ones, add each column in turn. When adding 6 tens + 9 tens = 15 tens = 1 hundred + 5 tens<br>Place 1 hundred under the hundreds answer and 5 tens in the answer. | <b>One exchange</b><br><br>Starting with the ones, subtract each column in turn. When subtracting 4 tens - 7 tens, exchange 1 hundred to make:<br>14 tens - 7 tens = 7 tens         |  |
| Altogether               |                                                                                                                                                                                                               |                                                                                                                                                                                     |  |
| Difference               |                                                                                                                                                                                                               |                                                                                                                                                                                     |  |
| Subtract                 |                                                                                                                                                                                                               |                                                                                                                                                                                     |  |
| Less                     | <b>Multiple exchanges</b><br><br>$\begin{array}{r} 5162 \\ + 3497 \\ \hline 8659 \\ 1 \end{array}$<br><br>Place 1 hundred under the hundreds answer and 5 tens in the answer.                                 | <b>Multiple exchanges</b><br><br>$\begin{array}{r} 61 \\ 5749 \\ - 3471 \\ \hline 2278 \end{array}$                                                                                 |  |
| Minus                    |                                                                                                                                                                                                               |                                                                                                                                                                                     |  |
| Take away                |                                                                                                                                                                                                               |                                                                                                                                                                                     |  |
| Mentally, Orally         |                                                                                                                                                                                                               |                                                                                                                                                                                     |  |
| Column Addition          |                                                                                                                                                                                                               |                                                                                                                                                                                     |  |
| Column Subtraction       |                                                                                                                                                                                                               |                                                                                                                                                                                     |  |
| Exchange                 |                                                                                                                                                                                                               |                                                                                                                                                                                     |  |
| Estimate                 |                                                                                                                                                                                                               |                                                                                                                                                                                     |  |
| Inverse operation        |                                                                                                                                                                                                               |                                                                                                                                                                                     |  |
| Solve problems           |                                                                                                                                                                                                               |                                                                                                                                                                                     |  |
| Number facts             |                                                                                                                                                                                                               |                                                                                                                                                                                     |  |
|                          |                                                                                                                                                                                                               |                                                                                                                                                                                     |  |
|                          |                                                                                                                                                                                                               | <b>Efficient subtraction</b>                                                                                                                                                        |  |
|                          |                                                                                                                                                                                                               |                                                                                                 |  |
|                          |                                                                                                                                                                                                               | Calculate 6000 - 3617 = 2383                                                                                                                                                        |  |

# Addition and Subtraction

# Knowledge Organiser

## Add and Subtract 1s, 10s, 100s, 1000s

Here is the number 3124

Add 2 thousands = 5124

Add 5 hundreds = 5624

Subtract 2 tens = 5604

Add 5 ones = 5609

Here is the number 6708

| Thousands | Hundreds | Tens | Ones |
|-----------|----------|------|------|
| 6         | 7        | 0    | 8    |

Add 3 thousands = 9708

Subtract 4 hundreds = 9308

Add 5 tens = 9358

Subtract 7 ones = 9351

**Crossing ones, tens or hundreds**

5392 + 4 tens = 5432 crossing tens

5126 - 600 = 4526 crossing hundreds

When crossing ones, tens or hundreds, more than one digit will change.

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## Round to Estimate

1635 + 386 = 2021

Round to the nearest ten

1640 + 390 = 2030

Round to the nearest hundred

1600 + 400 = 2000

Both give a reasonable estimate, but rounding the nearest ten is more accurate.

9362 - 5729 = 3622

Round to the nearest hundred

9400 - 5700 = 3700

Round to the nearest thousand

9000 - 6000 = 3000

Rounding to the nearest hundred is much more accurate in this case.

## Checking Strategies

**Using Inverse**

3476 - 744 = 2732 can be checked using

2732 + 744 = 3476

This part whole shows the inverse calculations using these three numbers.

|                    |                    |
|--------------------|--------------------|
| 1549 + 2688 = 4237 | 2688 + 1549 = 4237 |
| 4237 - 1549 = 2688 | 4237 - 2688 = 1549 |

**Adding in a different order**

420 + 372 + 280 =

**Change to**

420 + 280 + 372 =

As 420 + 280 = 700

(because 42 + 28 = 70)

420 + 280 + 372 = 700 + 372 = 1072

# Multiplication and Division: Stage 3

| Multiplication and Division                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                             | Knowledge Organiser                                                                                                                                         |    |    |    |    |    |    |     |     |     |     |    |    |   |   |   |   |   |   |   |   |   |   |    |    |    |   |   |   |   |   |    |    |    |    |    |    |    |    |   |   |   |   |    |    |    |    |    |    |    |    |    |   |   |   |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |     |    |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |     |     |     |     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |  |                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                              |
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| <b>Key Vocabulary</b><br>times tables<br>multiply by<br>divide by<br>array<br>fact families<br>regrouping                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | <b>Multiplication and Division Facts (3, 4 and 8 multiplication tables)</b> |                                                                                                                                                             |    |    |    |    |    |    |     |     |     |     |    |    |   |   |   |   |   |   |   |   |   |   |    |    |    |   |   |   |   |   |    |    |    |    |    |    |    |    |   |   |   |   |    |    |    |    |    |    |    |    |    |   |   |   |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |     |    |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |     |     |     |     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |  |                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                              |
| <table border="1"> <tr><th>x</th><th>1</th><th>2</th><th>3</th><th>4</th><th>5</th><th>6</th><th>7</th><th>8</th><th>9</th><th>10</th><th>11</th><th>12</th></tr> <tr><th>1</th><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td><td>10</td><td>11</td><td>12</td></tr> <tr><th>2</th><td>2</td><td>4</td><td>6</td><td>8</td><td>10</td><td>12</td><td>14</td><td>16</td><td>18</td><td>20</td><td>22</td><td>24</td></tr> <tr><th>3</th><td>3</td><td>6</td><td>9</td><td>12</td><td>15</td><td>18</td><td>21</td><td>24</td><td>27</td><td>30</td><td>33</td><td>36</td></tr> <tr><th>4</th><td>4</td><td>8</td><td>12</td><td>16</td><td>20</td><td>24</td><td>28</td><td>32</td><td>36</td><td>40</td><td>44</td><td>48</td></tr> <tr><th>5</th><td>5</td><td>10</td><td>15</td><td>20</td><td>25</td><td>30</td><td>35</td><td>40</td><td>45</td><td>50</td><td>55</td><td>60</td></tr> <tr><th>6</th><td>6</td><td>12</td><td>18</td><td>24</td><td>30</td><td>36</td><td>42</td><td>48</td><td>54</td><td>60</td><td>66</td><td>72</td></tr> <tr><th>7</th><td>7</td><td>14</td><td>21</td><td>28</td><td>35</td><td>42</td><td>49</td><td>56</td><td>63</td><td>70</td><td>77</td><td>84</td></tr> <tr><th>8</th><td>8</td><td>16</td><td>24</td><td>32</td><td>40</td><td>48</td><td>56</td><td>64</td><td>72</td><td>80</td><td>88</td><td>96</td></tr> <tr><th>9</th><td>9</td><td>18</td><td>27</td><td>36</td><td>45</td><td>54</td><td>63</td><td>72</td><td>81</td><td>90</td><td>99</td><td>108</td></tr> <tr><th>10</th><td>10</td><td>20</td><td>30</td><td>40</td><td>50</td><td>60</td><td>70</td><td>80</td><td>90</td><td>100</td><td>110</td><td>120</td></tr> <tr><th>11</th><td>11</td><td>22</td><td>33</td><td>44</td><td>55</td><td>66</td><td>77</td><td>88</td><td>99</td><td>110</td><td>121</td><td>132</td></tr> <tr><th>12</th><td>12</td><td>24</td><td>36</td><td>48</td><td>60</td><td>72</td><td>84</td><td>96</td><td>108</td><td>120</td><td>132</td><td>144</td></tr> </table> |                                                                             | x                                                                                                                                                           | 1  | 2  | 3  | 4  | 5  | 6  | 7   | 8   | 9   | 10  | 11 | 12 | 1 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 2 | 2 | 4 | 6 | 8 | 10 | 12 | 14 | 16 | 18 | 20 | 22 | 24 | 3 | 3 | 6 | 9 | 12 | 15 | 18 | 21 | 24 | 27 | 30 | 33 | 36 | 4 | 4 | 8 | 12 | 16 | 20 | 24 | 28 | 32 | 36 | 40 | 44 | 48 | 5 | 5 | 10 | 15 | 20 | 25 | 30 | 35 | 40 | 45 | 50 | 55 | 60 | 6 | 6 | 12 | 18 | 24 | 30 | 36 | 42 | 48 | 54 | 60 | 66 | 72 | 7 | 7 | 14 | 21 | 28 | 35 | 42 | 49 | 56 | 63 | 70 | 77 | 84 | 8 | 8 | 16 | 24 | 32 | 40 | 48 | 56 | 64 | 72 | 80 | 88 | 96 | 9 | 9 | 18 | 27 | 36 | 45 | 54 | 63 | 72 | 81 | 90 | 99 | 108 | 10 | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 80 | 90 | 100 | 110 | 120 | 11 | 11 | 22 | 33 | 44 | 55 | 66 | 77 | 88 | 99 | 110 | 121 | 132 | 12 | 12 | 24 | 36 | 48 | 60 | 72 | 84 | 96 | 108 | 120 | 132 | 144 | <div> <b>3 x Tables</b> <math>1 \times 3 = 3</math><br/> <math>2 \times 3 = 6</math><br/> <math>3 \times 3 = 9</math><br/> <math>4 \times 3 = 12</math><br/> <math>5 \times 3 = 15</math><br/> <math>6 \times 3 = 18</math><br/> <math>7 \times 3 = 21</math><br/> <math>8 \times 3 = 24</math><br/> <math>9 \times 3 = 27</math><br/> <math>10 \times 3 = 30</math><br/> <math>11 \times 3 = 33</math><br/> <math>12 \times 3 = 36</math> </div> <div> <math>3 \div 3 = 1</math><br/> <math>6 \div 3 = 2</math><br/> <math>9 \div 3 = 3</math><br/> <math>12 \div 3 = 4</math><br/> <math>15 \div 3 = 5</math><br/> <math>18 \div 3 = 6</math><br/> <math>21 \div 3 = 7</math><br/> <math>24 \div 3 = 8</math><br/> <math>27 \div 3 = 9</math><br/> <math>30 \div 3 = 10</math><br/> <math>33 \div 3 = 11</math><br/> <math>36 \div 3 = 12</math> </div> |  | <b>4 x Tables</b> $1 \times 4 = 4$<br>$2 \times 4 = 8$<br>$3 \times 4 = 12$<br>$4 \times 4 = 16$<br>$5 \times 4 = 20$<br>$6 \times 4 = 24$<br>$7 \times 4 = 28$<br>$8 \times 4 = 32$<br>$9 \times 4 = 36$<br>$10 \times 4 = 40$<br>$11 \times 4 = 44$<br>$12 \times 4 = 48$ | <b>8 x Tables</b> $1 \times 8 = 8$<br>$2 \times 8 = 16$<br>$3 \times 8 = 24$<br>$4 \times 8 = 32$<br>$5 \times 8 = 40$<br>$6 \times 8 = 48$<br>$7 \times 8 = 56$<br>$8 \times 8 = 64$<br>$9 \times 8 = 72$<br>$10 \times 8 = 80$<br>$11 \times 8 = 88$<br>$12 \times 8 = 96$ |
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| <b>Write and Calculate Mathematical Statements</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                             | <b>Related Calculations</b>                                                                                                                                 |    |    |    |    |    |    |     |     |     |     |    |    |   |   |   |   |   |   |   |   |   |   |    |    |    |   |   |   |   |   |    |    |    |    |    |    |    |    |   |   |   |   |    |    |    |    |    |    |    |    |    |   |   |   |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |     |    |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |     |     |     |     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |  |                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                              |
| <div> <math>4 \times 8 = 32</math><br/> <math>32 \div 8 = 4</math> </div> <div> <math>8 \times 4 = 32</math><br/> <math>32 \div 4 = 8</math> </div> <div> <math>5 \times 3 = 15</math><br/> <math>15 \div 3 = 5</math> </div> <div> <math>3 \times 5 = 15</math><br/> <math>15 \div 5 = 3</math> </div>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                             | <div> <math>3 \times 4 = 12</math><br/> <math>4 \times 3 = 12</math> </div> <div> <math>30 \times 4 = 120</math><br/> <math>40 \times 3 = 120</math> </div> |    |    |    |    |    |    |     |     |     |     |    |    |   |   |   |   |   |   |   |   |   |   |    |    |    |   |   |   |   |   |    |    |    |    |    |    |    |    |   |   |   |   |    |    |    |    |    |    |    |    |    |   |   |   |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |     |    |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |     |     |     |     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |  |                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                              |

| Multiplication and Division                                                                                                                                                                                                                                                                                 |   | Knowledge Organiser                                     |   |   |   |   |   |                                                                                                                                                                                                                                      |  |   |   |   |   |                                                                                                                                                                                                                                                                                                                                                   |   |  |   |   |  |   |   |   |  |   |  |   |   |  |   |  |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|---------------------------------------------------------|---|---|---|---|---|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|---|---|---|---|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|--|---|---|--|---|---|---|--|---|--|---|---|--|---|--|
| <b>Written Multiplication Methods - No Regrouping</b>                                                                                                                                                                                                                                                       |   | <b>Written Multiplication Methods - With Regrouping</b> |   |   |   |   |   |                                                                                                                                                                                                                                      |  |   |   |   |   |                                                                                                                                                                                                                                                                                                                                                   |   |  |   |   |  |   |   |   |  |   |  |   |   |  |   |  |
| <div> <b>Tens</b><br/> </div> <div> <b>Ones</b><br/> </div> <div> <math>23 \times 3 = 69</math> </div> <div> <table border="1"> <tr><td></td><td>T</td><td>O</td></tr> <tr><td></td><td>2</td><td>3</td></tr> <tr><td>x</td><td></td><td>3</td></tr> <tr><td></td><td>6</td><td>9</td></tr> </table> </div> |   |                                                         | T | O |   | 2 | 3 | x                                                                                                                                                                                                                                    |  | 3 |   | 6 | 9 | <div> <b>Tens</b><br/> </div> <div> <b>Ones</b><br/> </div> <div> <math>24 \times 4 = 96</math> </div> <div> <table border="1"> <tr><td></td><td>T</td><td>O</td></tr> <tr><td></td><td>2</td><td>4</td></tr> <tr><td>x</td><td></td><td>4</td></tr> <tr><td></td><td>9</td><td>6</td></tr> <tr><td></td><td>1</td><td></td></tr> </table> </div> |   |  | T | O |  | 2 | 4 | x |  | 4 |  | 9 | 6 |  | 1 |  |
|                                                                                                                                                                                                                                                                                                             | T | O                                                       |   |   |   |   |   |                                                                                                                                                                                                                                      |  |   |   |   |   |                                                                                                                                                                                                                                                                                                                                                   |   |  |   |   |  |   |   |   |  |   |  |   |   |  |   |  |
|                                                                                                                                                                                                                                                                                                             | 2 | 3                                                       |   |   |   |   |   |                                                                                                                                                                                                                                      |  |   |   |   |   |                                                                                                                                                                                                                                                                                                                                                   |   |  |   |   |  |   |   |   |  |   |  |   |   |  |   |  |
| x                                                                                                                                                                                                                                                                                                           |   | 3                                                       |   |   |   |   |   |                                                                                                                                                                                                                                      |  |   |   |   |   |                                                                                                                                                                                                                                                                                                                                                   |   |  |   |   |  |   |   |   |  |   |  |   |   |  |   |  |
|                                                                                                                                                                                                                                                                                                             | 6 | 9                                                       |   |   |   |   |   |                                                                                                                                                                                                                                      |  |   |   |   |   |                                                                                                                                                                                                                                                                                                                                                   |   |  |   |   |  |   |   |   |  |   |  |   |   |  |   |  |
|                                                                                                                                                                                                                                                                                                             | T | O                                                       |   |   |   |   |   |                                                                                                                                                                                                                                      |  |   |   |   |   |                                                                                                                                                                                                                                                                                                                                                   |   |  |   |   |  |   |   |   |  |   |  |   |   |  |   |  |
|                                                                                                                                                                                                                                                                                                             | 2 | 4                                                       |   |   |   |   |   |                                                                                                                                                                                                                                      |  |   |   |   |   |                                                                                                                                                                                                                                                                                                                                                   |   |  |   |   |  |   |   |   |  |   |  |   |   |  |   |  |
| x                                                                                                                                                                                                                                                                                                           |   | 4                                                       |   |   |   |   |   |                                                                                                                                                                                                                                      |  |   |   |   |   |                                                                                                                                                                                                                                                                                                                                                   |   |  |   |   |  |   |   |   |  |   |  |   |   |  |   |  |
|                                                                                                                                                                                                                                                                                                             | 9 | 6                                                       |   |   |   |   |   |                                                                                                                                                                                                                                      |  |   |   |   |   |                                                                                                                                                                                                                                                                                                                                                   |   |  |   |   |  |   |   |   |  |   |  |   |   |  |   |  |
|                                                                                                                                                                                                                                                                                                             | 1 |                                                         |   |   |   |   |   |                                                                                                                                                                                                                                      |  |   |   |   |   |                                                                                                                                                                                                                                                                                                                                                   |   |  |   |   |  |   |   |   |  |   |  |   |   |  |   |  |
| <b>Written Division Methods - No Regrouping</b>                                                                                                                                                                                                                                                             |   | <b>Written Division Methods - With Regrouping</b>       |   |   |   |   |   |                                                                                                                                                                                                                                      |  |   |   |   |   |                                                                                                                                                                                                                                                                                                                                                   |   |  |   |   |  |   |   |   |  |   |  |   |   |  |   |  |
| <div> <b>Tens</b><br/> </div> <div> <b>Ones</b><br/> </div> <div> <math>84 \div 4</math> </div> <div> <table border="1"> <tr><td></td><td>2</td><td>1</td></tr> <tr><td>4</td><td>8</td><td>4</td></tr> </table> </div> <div> </div>                                                                        |   |                                                         | 2 | 1 | 4 | 8 | 4 | <div> <b>Tens</b><br/> </div> <div> <b>Ones</b><br/> </div> <div> <math>45 \div 3</math> </div> <div> <table border="1"> <tr><td></td><td>1</td><td>5</td></tr> <tr><td>3</td><td>4</td><td>5</td></tr> </table> </div> <div> </div> |  |   | 1 | 5 | 3 | 4                                                                                                                                                                                                                                                                                                                                                 | 5 |  |   |   |  |   |   |   |  |   |  |   |   |  |   |  |
|                                                                                                                                                                                                                                                                                                             | 2 | 1                                                       |   |   |   |   |   |                                                                                                                                                                                                                                      |  |   |   |   |   |                                                                                                                                                                                                                                                                                                                                                   |   |  |   |   |  |   |   |   |  |   |  |   |   |  |   |  |
| 4                                                                                                                                                                                                                                                                                                           | 8 | 4                                                       |   |   |   |   |   |                                                                                                                                                                                                                                      |  |   |   |   |   |                                                                                                                                                                                                                                                                                                                                                   |   |  |   |   |  |   |   |   |  |   |  |   |   |  |   |  |
|                                                                                                                                                                                                                                                                                                             | 1 | 5                                                       |   |   |   |   |   |                                                                                                                                                                                                                                      |  |   |   |   |   |                                                                                                                                                                                                                                                                                                                                                   |   |  |   |   |  |   |   |   |  |   |  |   |   |  |   |  |
| 3                                                                                                                                                                                                                                                                                                           | 4 | 5                                                       |   |   |   |   |   |                                                                                                                                                                                                                                      |  |   |   |   |   |                                                                                                                                                                                                                                                                                                                                                   |   |  |   |   |  |   |   |   |  |   |  |   |   |  |   |  |

# Multiplication and Division: Stage 4

| Multiplication and Division |    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |    |    |    |    |    |    |     |     |     |     | Knowledge Organiser |                                                                                                                                                                                                                                                                                                                                                                   |   |   |    |    |    |    |    |    |    |    |    |    |    |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |     |    |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |     |     |     |     |                                                                                                                                                                |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |     |     |     |     |                                                                                                                                                            |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |     |     |     |     |                                                                                                                                                        |  |  |  |  |  |  |  |  |  |  |  |  |
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| Key Vocabulary              |    | Multiplication and Division Facts                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |    |    |    |    |    |    |     |     |     |     |                     | Use Place Value to Multiply and Divide Mentally                                                                                                                                                                                                                                                                                                                   |   |   |    |    |    |    |    |    |    |    |    |    |    |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |     |    |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |     |     |     |     |                                                                                                                                                                |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |     |     |     |     |                                                                                                                                                            |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |     |     |     |     |                                                                                                                                                        |  |  |  |  |  |  |  |  |  |  |  |  |
| multiply                    |    | <table><tr><td>x</td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td><td>10</td><td>11</td><td>12</td></tr><tr><td>1</td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td><td>10</td><td>11</td><td>12</td></tr><tr><td>2</td><td>2</td><td>4</td><td>6</td><td>8</td><td>10</td><td>12</td><td>14</td><td>16</td><td>18</td><td>20</td><td>22</td><td>24</td></tr><tr><td>3</td><td>3</td><td>6</td><td>9</td><td>12</td><td>15</td><td>18</td><td>21</td><td>24</td><td>27</td><td>30</td><td>33</td><td>36</td></tr><tr><td>4</td><td>4</td><td>8</td><td>12</td><td>16</td><td>20</td><td>24</td><td>28</td><td>32</td><td>36</td><td>40</td><td>44</td><td>48</td></tr><tr><td>5</td><td>5</td><td>10</td><td>15</td><td>20</td><td>25</td><td>30</td><td>35</td><td>40</td><td>45</td><td>50</td><td>55</td><td>60</td></tr><tr><td>6</td><td>6</td><td>12</td><td>18</td><td>24</td><td>30</td><td>36</td><td>42</td><td>48</td><td>54</td><td>60</td><td>66</td><td>72</td></tr><tr><td>7</td><td>7</td><td>14</td><td>21</td><td>28</td><td>35</td><td>42</td><td>49</td><td>56</td><td>63</td><td>70</td><td>77</td><td>84</td></tr><tr><td>8</td><td>8</td><td>16</td><td>24</td><td>32</td><td>40</td><td>48</td><td>56</td><td>64</td><td>72</td><td>80</td><td>88</td><td>96</td></tr><tr><td>9</td><td>9</td><td>18</td><td>27</td><td>36</td><td>45</td><td>54</td><td>63</td><td>72</td><td>81</td><td>90</td><td>99</td><td>108</td></tr><tr><td>10</td><td>10</td><td>20</td><td>30</td><td>40</td><td>50</td><td>60</td><td>70</td><td>80</td><td>90</td><td>100</td><td>110</td><td>120</td></tr><tr><td>11</td><td>11</td><td>22</td><td>33</td><td>44</td><td>55</td><td>66</td><td>77</td><td>88</td><td>99</td><td>110</td><td>121</td><td>132</td></tr><tr><td>12</td><td>12</td><td>24</td><td>36</td><td>48</td><td>60</td><td>72</td><td>84</td><td>96</td><td>108</td><td>120</td><td>132</td><td>144</td></tr></table> |    |    |    |    |    |    |     |     |     |     |                     | x                                                                                                                                                                                                                                                                                                                                                                 | 1 | 2 | 3  | 4  | 5  | 6  | 7  | 8  | 9  | 10 | 11 | 12 | 1  | 1 | 2  | 3  | 4  | 5  | 6  | 7  | 8  | 9  | 10 | 11 | 12 | 2 | 2 | 4  | 6  | 8  | 10 | 12 | 14 | 16 | 18 | 20 | 22 | 24 | 3 | 3 | 6  | 9  | 12 | 15 | 18 | 21 | 24 | 27 | 30 | 33 | 36 | 4 | 4 | 8  | 12 | 16 | 20 | 24 | 28 | 32 | 36 | 40 | 44 | 48 | 5 | 5 | 10 | 15 | 20 | 25 | 30 | 35 | 40 | 45 | 50 | 55 | 60  | 6  | 6  | 12 | 18 | 24 | 30 | 36 | 42 | 48 | 54 | 60  | 66  | 72  | 7  | 7  | 14 | 21 | 28 | 35 | 42 | 49 | 56 | 63 | 70  | 77  | 84  | 8  | 8  | 16 | 24 | 32 | 40 | 48 | 56 | 64 | 72  | 80  | 88  | 96  | 9                                                                                                                                                              | 9  | 18 | 27 | 36 | 45 | 54 | 63 | 72 | 81 | 90  | 99  | 108 | 10 | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 80 | 90  | 100 | 110 | 120 | 11                                                                                                                                                         | 11 | 22 | 33 | 44 | 55 | 66 | 77 | 88 | 99 | 110 | 121 | 132 | 12 | 12 | 24 | 36 | 48 | 60 | 72 | 84 | 96 | 108 | 120 | 132 | 144 | <div><math>5 \times 1 = 5</math><br/><math>5 \div 1 = 5</math></div> |  |  |  |  |  |  |  |  |  |  |  |  |
| x                           | 1  | 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 3  | 4  | 5  | 6  | 7  | 8  | 9   | 10  | 11  | 12  |                     |                                                                                                                                                                                                                                                                                                                                                                   |   |   |    |    |    |    |    |    |    |    |    |    |    |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |     |    |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |     |     |     |     |                                                                                                                                                                |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |     |     |     |     |                                                                                                                                                            |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |     |     |     |     |                                                                                                                                                        |  |  |  |  |  |  |  |  |  |  |  |  |
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| 2                           | 2  | 4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 6  | 8  | 10 | 12 | 14 | 16 | 18  | 20  | 22  | 24  |                     |                                                                                                                                                                                                                                                                                                                                                                   |   |   |    |    |    |    |    |    |    |    |    |    |    |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |     |    |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |     |     |     |     |                                                                                                                                                                |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |     |     |     |     |                                                                                                                                                            |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |     |     |     |     |                                                                                                                                                        |  |  |  |  |  |  |  |  |  |  |  |  |
| 3                           | 3  | 6                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 9  | 12 | 15 | 18 | 21 | 24 | 27  | 30  | 33  | 36  |                     |                                                                                                                                                                                                                                                                                                                                                                   |   |   |    |    |    |    |    |    |    |    |    |    |    |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |     |    |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |     |     |     |     |                                                                                                                                                                |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |     |     |     |     |                                                                                                                                                            |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |     |     |     |     |                                                                                                                                                        |  |  |  |  |  |  |  |  |  |  |  |  |
| 4                           | 4  | 8                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 12 | 16 | 20 | 24 | 28 | 32 | 36  | 40  | 44  | 48  |                     |                                                                                                                                                                                                                                                                                                                                                                   |   |   |    |    |    |    |    |    |    |    |    |    |    |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |     |    |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |     |     |     |     |                                                                                                                                                                |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |     |     |     |     |                                                                                                                                                            |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |     |     |     |     |                                                                                                                                                        |  |  |  |  |  |  |  |  |  |  |  |  |
| 5                           | 5  | 10                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 15 | 20 | 25 | 30 | 35 | 40 | 45  | 50  | 55  | 60  |                     |                                                                                                                                                                                                                                                                                                                                                                   |   |   |    |    |    |    |    |    |    |    |    |    |    |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |     |    |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |     |     |     |     |                                                                                                                                                                |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |     |     |     |     |                                                                                                                                                            |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |     |     |     |     |                                                                                                                                                        |  |  |  |  |  |  |  |  |  |  |  |  |
| 6                           | 6  | 12                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 18 | 24 | 30 | 36 | 42 | 48 | 54  | 60  | 66  | 72  |                     |                                                                                                                                                                                                                                                                                                                                                                   |   |   |    |    |    |    |    |    |    |    |    |    |    |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |     |    |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |     |     |     |     |                                                                                                                                                                |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |     |     |     |     |                                                                                                                                                            |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |     |     |     |     |                                                                                                                                                        |  |  |  |  |  |  |  |  |  |  |  |  |
| 7                           | 7  | 14                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 21 | 28 | 35 | 42 | 49 | 56 | 63  | 70  | 77  | 84  |                     |                                                                                                                                                                                                                                                                                                                                                                   |   |   |    |    |    |    |    |    |    |    |    |    |    |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |     |    |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |     |     |     |     |                                                                                                                                                                |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |     |     |     |     |                                                                                                                                                            |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |     |     |     |     |                                                                                                                                                        |  |  |  |  |  |  |  |  |  |  |  |  |
| 8                           | 8  | 16                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 24 | 32 | 40 | 48 | 56 | 64 | 72  | 80  | 88  | 96  |                     |                                                                                                                                                                                                                                                                                                                                                                   |   |   |    |    |    |    |    |    |    |    |    |    |    |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |     |    |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |     |     |     |     |                                                                                                                                                                |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |     |     |     |     |                                                                                                                                                            |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |     |     |     |     |                                                                                                                                                        |  |  |  |  |  |  |  |  |  |  |  |  |
| 9                           | 9  | 18                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 27 | 36 | 45 | 54 | 63 | 72 | 81  | 90  | 99  | 108 |                     |                                                                                                                                                                                                                                                                                                                                                                   |   |   |    |    |    |    |    |    |    |    |    |    |    |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |     |    |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |     |     |     |     |                                                                                                                                                                |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |     |     |     |     |                                                                                                                                                            |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |     |     |     |     |                                                                                                                                                        |  |  |  |  |  |  |  |  |  |  |  |  |
| 10                          | 10 | 20                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 30 | 40 | 50 | 60 | 70 | 80 | 90  | 100 | 110 | 120 |                     |                                                                                                                                                                                                                                                                                                                                                                   |   |   |    |    |    |    |    |    |    |    |    |    |    |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |     |    |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |     |     |     |     |                                                                                                                                                                |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |     |     |     |     |                                                                                                                                                            |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |     |     |     |     |                                                                                                                                                        |  |  |  |  |  |  |  |  |  |  |  |  |
| 11                          | 11 | 22                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 33 | 44 | 55 | 66 | 77 | 88 | 99  | 110 | 121 | 132 |                     |                                                                                                                                                                                                                                                                                                                                                                   |   |   |    |    |    |    |    |    |    |    |    |    |    |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |     |    |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |     |     |     |     |                                                                                                                                                                |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |     |     |     |     |                                                                                                                                                            |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |     |     |     |     |                                                                                                                                                        |  |  |  |  |  |  |  |  |  |  |  |  |
| 12                          | 12 | 24                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 36 | 48 | 60 | 72 | 84 | 96 | 108 | 120 | 132 | 144 |                     |                                                                                                                                                                                                                                                                                                                                                                   |   |   |    |    |    |    |    |    |    |    |    |    |    |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |     |    |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |     |     |     |     |                                                                                                                                                                |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |     |     |     |     |                                                                                                                                                            |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |     |     |     |     |                                                                                                                                                        |  |  |  |  |  |  |  |  |  |  |  |  |
| groups of                   |    | <table><tr><td>2</td><td>2</td><td>4</td><td>6</td><td>8</td><td>10</td><td>12</td><td>14</td><td>16</td><td>18</td><td>20</td><td>22</td><td>24</td></tr><tr><td>3</td><td>3</td><td>6</td><td>9</td><td>12</td><td>15</td><td>18</td><td>21</td><td>24</td><td>27</td><td>30</td><td>33</td><td>36</td></tr><tr><td>4</td><td>4</td><td>8</td><td>12</td><td>16</td><td>20</td><td>24</td><td>28</td><td>32</td><td>36</td><td>40</td><td>44</td><td>48</td></tr><tr><td>5</td><td>5</td><td>10</td><td>15</td><td>20</td><td>25</td><td>30</td><td>35</td><td>40</td><td>45</td><td>50</td><td>55</td><td>60</td></tr><tr><td>6</td><td>6</td><td>12</td><td>18</td><td>24</td><td>30</td><td>36</td><td>42</td><td>48</td><td>54</td><td>60</td><td>66</td><td>72</td></tr><tr><td>7</td><td>7</td><td>14</td><td>21</td><td>28</td><td>35</td><td>42</td><td>49</td><td>56</td><td>63</td><td>70</td><td>77</td><td>84</td></tr><tr><td>8</td><td>8</td><td>16</td><td>24</td><td>32</td><td>40</td><td>48</td><td>56</td><td>64</td><td>72</td><td>80</td><td>88</td><td>96</td></tr><tr><td>9</td><td>9</td><td>18</td><td>27</td><td>36</td><td>45</td><td>54</td><td>63</td><td>72</td><td>81</td><td>90</td><td>99</td><td>108</td></tr><tr><td>10</td><td>10</td><td>20</td><td>30</td><td>40</td><td>50</td><td>60</td><td>70</td><td>80</td><td>90</td><td>100</td><td>110</td><td>120</td></tr><tr><td>11</td><td>11</td><td>22</td><td>33</td><td>44</td><td>55</td><td>66</td><td>77</td><td>88</td><td>99</td><td>110</td><td>121</td><td>132</td></tr><tr><td>12</td><td>12</td><td>24</td><td>36</td><td>48</td><td>60</td><td>72</td><td>84</td><td>96</td><td>108</td><td>120</td><td>132</td><td>144</td></tr></table>                                                                                                                                                                                                                                                                                             |    |    |    |    |    |    |     |     |     |     |                     | 2                                                                                                                                                                                                                                                                                                                                                                 | 2 | 4 | 6  | 8  | 10 | 12 | 14 | 16 | 18 | 20 | 22 | 24 | 3  | 3 | 6  | 9  | 12 | 15 | 18 | 21 | 24 | 27 | 30 | 33 | 36 | 4 | 4 | 8  | 12 | 16 | 20 | 24 | 28 | 32 | 36 | 40 | 44 | 48 | 5 | 5 | 10 | 15 | 20 | 25 | 30 | 35 | 40 | 45 | 50 | 55 | 60 | 6 | 6 | 12 | 18 | 24 | 30 | 36 | 42 | 48 | 54 | 60 | 66 | 72 | 7 | 7 | 14 | 21 | 28 | 35 | 42 | 49 | 56 | 63 | 70 | 77 | 84  | 8  | 8  | 16 | 24 | 32 | 40 | 48 | 56 | 64 | 72 | 80  | 88  | 96  | 9  | 9  | 18 | 27 | 36 | 45 | 54 | 63 | 72 | 81 | 90  | 99  | 108 | 10 | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 80 | 90  | 100 | 110 | 120 | 11                                                                                                                                                             | 11 | 22 | 33 | 44 | 55 | 66 | 77 | 88 | 99 | 110 | 121 | 132 | 12 | 12 | 24 | 36 | 48 | 60 | 72 | 84 | 96 | 108 | 120 | 132 | 144 | <div><math>5 \times 10 = 50</math><br/><math>50 \div 10 = 5</math></div> |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |     |     |     |     |                                                                                                                                                        |  |  |  |  |  |  |  |  |  |  |  |  |
| 2                           | 2  | 4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 6  | 8  | 10 | 12 | 14 | 16 | 18  | 20  | 22  | 24  |                     |                                                                                                                                                                                                                                                                                                                                                                   |   |   |    |    |    |    |    |    |    |    |    |    |    |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |     |    |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |     |     |     |     |                                                                                                                                                                |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |     |     |     |     |                                                                                                                                                            |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |     |     |     |     |                                                                                                                                                        |  |  |  |  |  |  |  |  |  |  |  |  |
| 3                           | 3  | 6                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 9  | 12 | 15 | 18 | 21 | 24 | 27  | 30  | 33  | 36  |                     |                                                                                                                                                                                                                                                                                                                                                                   |   |   |    |    |    |    |    |    |    |    |    |    |    |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |     |    |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |     |     |     |     |                                                                                                                                                                |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |     |     |     |     |                                                                                                                                                            |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |     |     |     |     |                                                                                                                                                        |  |  |  |  |  |  |  |  |  |  |  |  |
| 4                           | 4  | 8                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 12 | 16 | 20 | 24 | 28 | 32 | 36  | 40  | 44  | 48  |                     |                                                                                                                                                                                                                                                                                                                                                                   |   |   |    |    |    |    |    |    |    |    |    |    |    |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |     |    |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |     |     |     |     |                                                                                                                                                                |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |     |     |     |     |                                                                                                                                                            |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |     |     |     |     |                                                                                                                                                        |  |  |  |  |  |  |  |  |  |  |  |  |
| 5                           | 5  | 10                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 15 | 20 | 25 | 30 | 35 | 40 | 45  | 50  | 55  | 60  |                     |                                                                                                                                                                                                                                                                                                                                                                   |   |   |    |    |    |    |    |    |    |    |    |    |    |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |     |    |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |     |     |     |     |                                                                                                                                                                |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |     |     |     |     |                                                                                                                                                            |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |     |     |     |     |                                                                                                                                                        |  |  |  |  |  |  |  |  |  |  |  |  |
| 6                           | 6  | 12                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 18 | 24 | 30 | 36 | 42 | 48 | 54  | 60  | 66  | 72  |                     |                                                                                                                                                                                                                                                                                                                                                                   |   |   |    |    |    |    |    |    |    |    |    |    |    |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |     |    |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |     |     |     |     |                                                                                                                                                                |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |     |     |     |     |                                                                                                                                                            |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |     |     |     |     |                                                                                                                                                        |  |  |  |  |  |  |  |  |  |  |  |  |
| 7                           | 7  | 14                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 21 | 28 | 35 | 42 | 49 | 56 | 63  | 70  | 77  | 84  |                     |                                                                                                                                                                                                                                                                                                                                                                   |   |   |    |    |    |    |    |    |    |    |    |    |    |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |     |    |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |     |     |     |     |                                                                                                                                                                |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |     |     |     |     |                                                                                                                                                            |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |     |     |     |     |                                                                                                                                                        |  |  |  |  |  |  |  |  |  |  |  |  |
| 8                           | 8  | 16                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 24 | 32 | 40 | 48 | 56 | 64 | 72  | 80  | 88  | 96  |                     |                                                                                                                                                                                                                                                                                                                                                                   |   |   |    |    |    |    |    |    |    |    |    |    |    |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |     |    |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |     |     |     |     |                                                                                                                                                                |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |     |     |     |     |                                                                                                                                                            |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |     |     |     |     |                                                                                                                                                        |  |  |  |  |  |  |  |  |  |  |  |  |
| 9                           | 9  | 18                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 27 | 36 | 45 | 54 | 63 | 72 | 81  | 90  | 99  | 108 |                     |                                                                                                                                                                                                                                                                                                                                                                   |   |   |    |    |    |    |    |    |    |    |    |    |    |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |     |    |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |     |     |     |     |                                                                                                                                                                |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |     |     |     |     |                                                                                                                                                            |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |     |     |     |     |                                                                                                                                                        |  |  |  |  |  |  |  |  |  |  |  |  |
| 10                          | 10 | 20                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 30 | 40 | 50 | 60 | 70 | 80 | 90  | 100 | 110 | 120 |                     |                                                                                                                                                                                                                                                                                                                                                                   |   |   |    |    |    |    |    |    |    |    |    |    |    |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |     |    |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |     |     |     |     |                                                                                                                                                                |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |     |     |     |     |                                                                                                                                                            |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |     |     |     |     |                                                                                                                                                        |  |  |  |  |  |  |  |  |  |  |  |  |
| 11                          | 11 | 22                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 33 | 44 | 55 | 66 | 77 | 88 | 99  | 110 | 121 | 132 |                     |                                                                                                                                                                                                                                                                                                                                                                   |   |   |    |    |    |    |    |    |    |    |    |    |    |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |     |    |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |     |     |     |     |                                                                                                                                                                |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |     |     |     |     |                                                                                                                                                            |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |     |     |     |     |                                                                                                                                                        |  |  |  |  |  |  |  |  |  |  |  |  |
| 12                          | 12 | 24                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 36 | 48 | 60 | 72 | 84 | 96 | 108 | 120 | 132 | 144 |                     |                                                                                                                                                                                                                                                                                                                                                                   |   |   |    |    |    |    |    |    |    |    |    |    |    |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |     |    |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |     |     |     |     |                                                                                                                                                                |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |     |     |     |     |                                                                                                                                                            |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |     |     |     |     |                                                                                                                                                        |  |  |  |  |  |  |  |  |  |  |  |  |
| lots of                     |    | <table><tr><td>4</td><td>4</td><td>8</td><td>12</td><td>16</td><td>20</td><td>24</td><td>28</td><td>32</td><td>36</td><td>40</td><td>44</td><td>48</td></tr><tr><td>5</td><td>5</td><td>10</td><td>15</td><td>20</td><td>25</td><td>30</td><td>35</td><td>40</td><td>45</td><td>50</td><td>55</td><td>60</td></tr><tr><td>6</td><td>6</td><td>12</td><td>18</td><td>24</td><td>30</td><td>36</td><td>42</td><td>48</td><td>54</td><td>60</td><td>66</td><td>72</td></tr><tr><td>7</td><td>7</td><td>14</td><td>21</td><td>28</td><td>35</td><td>42</td><td>49</td><td>56</td><td>63</td><td>70</td><td>77</td><td>84</td></tr><tr><td>8</td><td>8</td><td>16</td><td>24</td><td>32</td><td>40</td><td>48</td><td>56</td><td>64</td><td>72</td><td>80</td><td>88</td><td>96</td></tr><tr><td>9</td><td>9</td><td>18</td><td>27</td><td>36</td><td>45</td><td>54</td><td>63</td><td>72</td><td>81</td><td>90</td><td>99</td><td>108</td></tr><tr><td>10</td><td>10</td><td>20</td><td>30</td><td>40</td><td>50</td><td>60</td><td>70</td><td>80</td><td>90</td><td>100</td><td>110</td><td>120</td></tr><tr><td>11</td><td>11</td><td>22</td><td>33</td><td>44</td><td>55</td><td>66</td><td>77</td><td>88</td><td>99</td><td>110</td><td>121</td><td>132</td></tr><tr><td>12</td><td>12</td><td>24</td><td>36</td><td>48</td><td>60</td><td>72</td><td>84</td><td>96</td><td>108</td><td>120</td><td>132</td><td>144</td></tr></table>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |    |    |    |    |    |    |     |     |     |     |                     | 4                                                                                                                                                                                                                                                                                                                                                                 | 4 | 8 | 12 | 16 | 20 | 24 | 28 | 32 | 36 | 40 | 44 | 48 | 5  | 5 | 10 | 15 | 20 | 25 | 30 | 35 | 40 | 45 | 50 | 55 | 60 | 6 | 6 | 12 | 18 | 24 | 30 | 36 | 42 | 48 | 54 | 60 | 66 | 72 | 7 | 7 | 14 | 21 | 28 | 35 | 42 | 49 | 56 | 63 | 70 | 77 | 84 | 8 | 8 | 16 | 24 | 32 | 40 | 48 | 56 | 64 | 72 | 80 | 88 | 96 | 9 | 9 | 18 | 27 | 36 | 45 | 54 | 63 | 72 | 81 | 90 | 99 | 108 | 10 | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 80 | 90 | 100 | 110 | 120 | 11 | 11 | 22 | 33 | 44 | 55 | 66 | 77 | 88 | 99 | 110 | 121 | 132 | 12 | 12 | 24 | 36 | 48 | 60 | 72 | 84 | 96 | 108 | 120 | 132 | 144 | <div><math>5 \times 100 = 500</math><br/><math>500 \div 100 = 5</math></div> |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |     |     |     |     |                                                                                                                                                            |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |     |     |     |     |                                                                                                                                                        |  |  |  |  |  |  |  |  |  |  |  |  |
| 4                           | 4  | 8                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 12 | 16 | 20 | 24 | 28 | 32 | 36  | 40  | 44  | 48  |                     |                                                                                                                                                                                                                                                                                                                                                                   |   |   |    |    |    |    |    |    |    |    |    |    |    |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |     |    |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |     |     |     |     |                                                                                                                                                                |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |     |     |     |     |                                                                                                                                                            |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |     |     |     |     |                                                                                                                                                        |  |  |  |  |  |  |  |  |  |  |  |  |
| 5                           | 5  | 10                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 15 | 20 | 25 | 30 | 35 | 40 | 45  | 50  | 55  | 60  |                     |                                                                                                                                                                                                                                                                                                                                                                   |   |   |    |    |    |    |    |    |    |    |    |    |    |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |     |    |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |     |     |     |     |                                                                                                                                                                |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |     |     |     |     |                                                                                                                                                            |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |     |     |     |     |                                                                                                                                                        |  |  |  |  |  |  |  |  |  |  |  |  |
| 6                           | 6  | 12                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 18 | 24 | 30 | 36 | 42 | 48 | 54  | 60  | 66  | 72  |                     |                                                                                                                                                                                                                                                                                                                                                                   |   |   |    |    |    |    |    |    |    |    |    |    |    |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |     |    |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |     |     |     |     |                                                                                                                                                                |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |     |     |     |     |                                                                                                                                                            |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |     |     |     |     |                                                                                                                                                        |  |  |  |  |  |  |  |  |  |  |  |  |
| 7                           | 7  | 14                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 21 | 28 | 35 | 42 | 49 | 56 | 63  | 70  | 77  | 84  |                     |                                                                                                                                                                                                                                                                                                                                                                   |   |   |    |    |    |    |    |    |    |    |    |    |    |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |     |    |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |     |     |     |     |                                                                                                                                                                |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |     |     |     |     |                                                                                                                                                            |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |     |     |     |     |                                                                                                                                                        |  |  |  |  |  |  |  |  |  |  |  |  |
| 8                           | 8  | 16                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 24 | 32 | 40 | 48 | 56 | 64 | 72  | 80  | 88  | 96  |                     |                                                                                                                                                                                                                                                                                                                                                                   |   |   |    |    |    |    |    |    |    |    |    |    |    |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |     |    |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |     |     |     |     |                                                                                                                                                                |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |     |     |     |     |                                                                                                                                                            |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |     |     |     |     |                                                                                                                                                        |  |  |  |  |  |  |  |  |  |  |  |  |
| 9                           | 9  | 18                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 27 | 36 | 45 | 54 | 63 | 72 | 81  | 90  | 99  | 108 |                     |                                                                                                                                                                                                                                                                                                                                                                   |   |   |    |    |    |    |    |    |    |    |    |    |    |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |     |    |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |     |     |     |     |                                                                                                                                                                |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |     |     |     |     |                                                                                                                                                            |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |     |     |     |     |                                                                                                                                                        |  |  |  |  |  |  |  |  |  |  |  |  |
| 10                          | 10 | 20                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 30 | 40 | 50 | 60 | 70 | 80 | 90  | 100 | 110 | 120 |                     |                                                                                                                                                                                                                                                                                                                                                                   |   |   |    |    |    |    |    |    |    |    |    |    |    |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |     |    |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |     |     |     |     |                                                                                                                                                                |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |     |     |     |     |                                                                                                                                                            |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |     |     |     |     |                                                                                                                                                        |  |  |  |  |  |  |  |  |  |  |  |  |
| 11                          | 11 | 22                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 33 | 44 | 55 | 66 | 77 | 88 | 99  | 110 | 121 | 132 |                     |                                                                                                                                                                                                                                                                                                                                                                   |   |   |    |    |    |    |    |    |    |    |    |    |    |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |     |    |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |     |     |     |     |                                                                                                                                                                |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |     |     |     |     |                                                                                                                                                            |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |     |     |     |     |                                                                                                                                                        |  |  |  |  |  |  |  |  |  |  |  |  |
| 12                          | 12 | 24                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 36 | 48 | 60 | 72 | 84 | 96 | 108 | 120 | 132 | 144 |                     |                                                                                                                                                                                                                                                                                                                                                                   |   |   |    |    |    |    |    |    |    |    |    |    |    |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |     |    |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |     |     |     |     |                                                                                                                                                                |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |     |     |     |     |                                                                                                                                                            |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |     |     |     |     |                                                                                                                                                        |  |  |  |  |  |  |  |  |  |  |  |  |
| times                       |    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |    |    |    |    |    |    |     |     |     |     |                     |                                                                                                                                                                                                                                                                                                                                                                   |   |   |    |    |    |    |    |    |    |    |    |    |    |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |     |    |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |     |     |     |     |                                                                                                                                                                |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |     |     |     |     |                                                                                                                                                            |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |     |     |     |     |                                                                                                                                                        |  |  |  |  |  |  |  |  |  |  |  |  |
| divide                      |    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |    |    |    |    |    |    |     |     |     |     |                     |                                                                                                                                                                                                                                                                                                                                                                   |   |   |    |    |    |    |    |    |    |    |    |    |    |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |     |    |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |     |     |     |     |                                                                                                                                                                |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |     |     |     |     |                                                                                                                                                            |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |     |     |     |     |                                                                                                                                                        |  |  |  |  |  |  |  |  |  |  |  |  |
| share                       |    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |    |    |    |    |    |    |     |     |     |     |                     |                                                                                                                                                                                                                                                                                                                                                                   |   |   |    |    |    |    |    |    |    |    |    |    |    |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |     |    |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |     |     |     |     |                                                                                                                                                                |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |     |     |     |     |                                                                                                                                                            |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |     |     |     |     |                                                                                                                                                        |  |  |  |  |  |  |  |  |  |  |  |  |
| remainder                   |    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |    |    |    |    |    |    |     |     |     |     |                     |                                                                                                                                                                                                                                                                                                                                                                   |   |   |    |    |    |    |    |    |    |    |    |    |    |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |     |    |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |     |     |     |     |                                                                                                                                                                |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |     |     |     |     |                                                                                                                                                            |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |     |     |     |     |                                                                                                                                                        |  |  |  |  |  |  |  |  |  |  |  |  |
|                             |    | Factor pairs and Commutativity                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |    |    |    |    |    |    |     |     |     |     |                     | Multiply Using Formal Written Methods                                                                                                                                                                                                                                                                                                                             |   |   |    |    |    |    |    |    |    |    |    |    |    |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |     |    |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |     |     |     |     |                                                                                                                                                                |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |     |     |     |     |                                                                                                                                                            |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |     |     |     |     |                                                                                                                                                        |  |  |  |  |  |  |  |  |  |  |  |  |
| factor                      |    | <div><math>5 \times 4 = 20</math><br/><math>4 \times 5 = 20</math><br/>The factors of 20 are 1, 2, 4, 5, 10 and 20.<br/>The factor pairs are:<br/>1 and 20   2 and 10   4 and 5</div>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |    |    |    |    |    |    |     |     |     |     |                     | <table><tr><th>Th</th><th>H</th><th>T</th><th>O</th></tr><tr><td></td><td>5</td><td>4</td><td>3</td></tr><tr><td>x</td><td></td><td></td><td>4</td></tr><tr><td></td><td></td><td>1</td><td>2</td></tr><tr><td></td><td>1</td><td>6</td><td>0</td></tr><tr><td>2</td><td>0</td><td>0</td><td>0</td></tr><tr><td>2</td><td>1</td><td>7</td><td>2</td></tr></table> |   |   |    |    |    |    |    |    |    |    |    |    | Th | H | T  | O  |    | 5  | 4  | 3  | x  |    |    | 4  |    |   | 1 | 2  |    | 1  | 6  | 0  | 2  | 0  | 0  | 0  | 2  | 1  | 7 | 2 |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |     |    |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |     |     |     |     |                                                                                                                                                                |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |     |     |     |     |                                                                                                                                                            |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |     |     |     |     |                                                                                                                                                        |  |  |  |  |  |  |  |  |  |  |  |  |
| Th                          | H  | T                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | O  |    |    |    |    |    |     |     |     |     |                     |                                                                                                                                                                                                                                                                                                                                                                   |   |   |    |    |    |    |    |    |    |    |    |    |    |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |     |    |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |     |     |     |     |                                                                                                                                                                |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |     |     |     |     |                                                                                                                                                            |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |     |     |     |     |                                                                                                                                                        |  |  |  |  |  |  |  |  |  |  |  |  |
|                             | 5  | 4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 3  |    |    |    |    |    |     |     |     |     |                     |                                                                                                                                                                                                                                                                                                                                                                   |   |   |    |    |    |    |    |    |    |    |    |    |    |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |     |    |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |     |     |     |     |                                                                                                                                                                |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |     |     |     |     |                                                                                                                                                            |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |     |     |     |     |                                                                                                                                                        |  |  |  |  |  |  |  |  |  |  |  |  |
| x                           |    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 4  |    |    |    |    |    |     |     |     |     |                     |                                                                                                                                                                                                                                                                                                                                                                   |   |   |    |    |    |    |    |    |    |    |    |    |    |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |     |    |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |     |     |     |     |                                                                                                                                                                |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |     |     |     |     |                                                                                                                                                            |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |     |     |     |     |                                                                                                                                                        |  |  |  |  |  |  |  |  |  |  |  |  |
|                             |    | 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 2  |    |    |    |    |    |     |     |     |     |                     |                                                                                                                                                                                                                                                                                                                                                                   |   |   |    |    |    |    |    |    |    |    |    |    |    |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |     |    |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |     |     |     |     |                                                                                                                                                                |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |     |     |     |     |                                                                                                                                                            |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |     |     |     |     |                                                                                                                                                        |  |  |  |  |  |  |  |  |  |  |  |  |
|                             | 1  | 6                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 0  |    |    |    |    |    |     |     |     |     |                     |                                                                                                                                                                                                                                                                                                                                                                   |   |   |    |    |    |    |    |    |    |    |    |    |    |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |     |    |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |     |     |     |     |                                                                                                                                                                |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |     |     |     |     |                                                                                                                                                            |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |     |     |     |     |                                                                                                                                                        |  |  |  |  |  |  |  |  |  |  |  |  |
| 2                           | 0  | 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 0  |    |    |    |    |    |     |     |     |     |                     |                                                                                                                                                                                                                                                                                                                                                                   |   |   |    |    |    |    |    |    |    |    |    |    |    |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |     |    |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |     |     |     |     |                                                                                                                                                                |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |     |     |     |     |                                                                                                                                                            |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |     |     |     |     |                                                                                                                                                        |  |  |  |  |  |  |  |  |  |  |  |  |
| 2                           | 1  | 7                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 2  |    |    |    |    |    |     |     |     |     |                     |                                                                                                                                                                                                                                                                                                                                                                   |   |   |    |    |    |    |    |    |    |    |    |    |    |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |     |    |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |     |     |     |     |                                                                                                                                                                |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |     |     |     |     |                                                                                                                                                            |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |     |     |     |     |                                                                                                                                                        |  |  |  |  |  |  |  |  |  |  |  |  |
| multiple                    |    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |    |    |    |    |    |    |     |     |     |     |                     | <table><tr><th>Th</th><th>H</th><th>T</th><th>O</th></tr><tr><td></td><td>5</td><td>4</td><td>3</td></tr><tr><td>x</td><td></td><td></td><td>4</td></tr><tr><td></td><td></td><td></td><td></td></tr><tr><td>2</td><td>1</td><td>7</td><td>2</td></tr><tr><td></td><td>1</td><td>1</td><td></td></tr></table>                                                     |   |   |    |    |    |    |    |    |    |    |    |    | Th | H | T  | O  |    | 5  | 4  | 3  | x  |    |    | 4  |    |   |   |    | 2  | 1  | 7  | 2  |    | 1  | 1  |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |     |    |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |     |     |     |     |                                                                                                                                                                |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |     |     |     |     |                                                                                                                                                            |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |     |     |     |     |                                                                                                                                                        |  |  |  |  |  |  |  |  |  |  |  |  |
| Th                          | H  | T                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | O  |    |    |    |    |    |     |     |     |     |                     |                                                                                                                                                                                                                                                                                                                                                                   |   |   |    |    |    |    |    |    |    |    |    |    |    |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |     |    |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |     |     |     |     |                                                                                                                                                                |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |     |     |     |     |                                                                                                                                                            |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |     |     |     |     |                                                                                                                                                        |  |  |  |  |  |  |  |  |  |  |  |  |
|                             | 5  | 4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 3  |    |    |    |    |    |     |     |     |     |                     |                                                                                                                                                                                                                                                                                                                                                                   |   |   |    |    |    |    |    |    |    |    |    |    |    |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |     |    |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |     |     |     |     |                                                                                                                                                                |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |     |     |     |     |                                                                                                                                                            |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |     |     |     |     |                                                                                                                                                        |  |  |  |  |  |  |  |  |  |  |  |  |
| x                           |    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 4  |    |    |    |    |    |     |     |     |     |                     |                                                                                                                                                                                                                                                                                                                                                                   |   |   |    |    |    |    |    |    |    |    |    |    |    |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |     |    |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |     |     |     |     |                                                                                                                                                                |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |     |     |     |     |                                                                                                                                                            |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |     |     |     |     |                                                                                                                                                        |  |  |  |  |  |  |  |  |  |  |  |  |
|                             |    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |    |    |    |    |    |    |     |     |     |     |                     |                                                                                                                                                                                                                                                                                                                                                                   |   |   |    |    |    |    |    |    |    |    |    |    |    |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |     |    |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |     |     |     |     |                                                                                                                                                                |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |     |     |     |     |                                                                                                                                                            |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |     |     |     |     |                                                                                                                                                        |  |  |  |  |  |  |  |  |  |  |  |  |
| 2                           | 1  | 7                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 2  |    |    |    |    |    |     |     |     |     |                     |                                                                                                                                                                                                                                                                                                                                                                   |   |   |    |    |    |    |    |    |    |    |    |    |    |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |     |    |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |     |     |     |     |                                                                                                                                                                |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |     |     |     |     |                                                                                                                                                            |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |     |     |     |     |                                                                                                                                                        |  |  |  |  |  |  |  |  |  |  |  |  |
|                             | 1  | 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |    |    |    |    |    |    |     |     |     |     |                     |                                                                                                                                                                                                                                                                                                                                                                   |   |   |    |    |    |    |    |    |    |    |    |    |    |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |     |    |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |     |     |     |     |                                                                                                                                                                |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |     |     |     |     |                                                                                                                                                            |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |     |     |     |     |                                                                                                                                                        |  |  |  |  |  |  |  |  |  |  |  |  |
| product                     |    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |    |    |    |    |    |    |     |     |     |     |                     | <div>Remember to move any regrouped numbers into the next column. After the next multiplication, add the regrouped number to the answer.</div>                                                                                                                                                                                                                    |   |   |    |    |    |    |    |    |    |    |    |    |    |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |    |   |   |    |    |    |    |    |    |    |    |    |    |     |    |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |     |     |     |     |                                                                                                                                                                |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |     |     |     |     |                                                                                                                                                            |    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |    |    |    |     |     |     |     |                                                                                                                                                        |  |  |  |  |  |  |  |  |  |  |  |  |
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Multiplication and Division

Knowledge Organiser

Mental Calculations for Solving Problems

$$(2 \times 3) \times 4 = 24$$

$$(2 \times 4) \times 3 = 24$$

$$(3 \times 4) \times 2 = 24$$

```

    graph TD
      A((16 x 3)) --> B((10 x 3))
      A --> C((6 x 3))
      B --> D[30 + 18 = 48]
  
```

Integer Scaling Problems

10 pencils

$10 \times 4 = 40$  pencils

75g

$75g \times 2 = 150g$

Short Division with Exact Answers

There are 69 tennis balls packed in tubes of 3.

There are 23 tubes altogether.

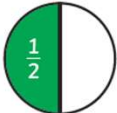
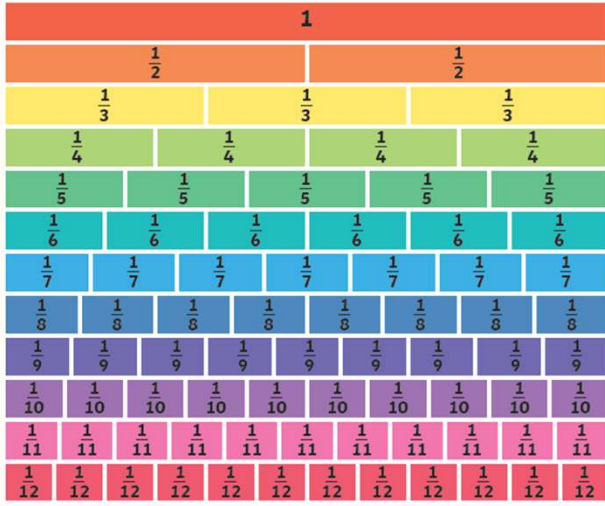
$$69 \div 3 = 23$$

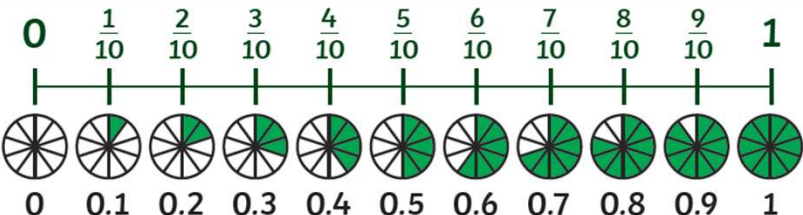
$$\begin{array}{r} 23 \\ 3 \overline{) 69} \end{array}$$

|    |    |    |
|----|----|----|
| 69 |    |    |
| 23 | 23 | 23 |

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# Fractions: Stage 3

| Fractions         |                                                                                                                                                                                                                                                             | Knowledge Organiser                                                                 |
|-------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Key Vocabulary    | Recognising Fractions                                                                                                                                                                                                                                       | Comparing Fractions                                                                 |
| numerator         |  $\frac{3}{8}$ <div> <p><b>Numerator</b><br/>How many equal parts of the whole are needed?</p> <p><b>Denominator</b><br/>How many equal parts are in the whole?</p> </div> | $\frac{1}{3}$ <b>Less than</b> $\frac{2}{3}$                                        |
| denominator       |                                                                                                                                                                                                                                                             | $\frac{4}{5}$ <b>Greater than</b> $\frac{3}{5}$                                     |
| unit fraction     |                                                                                                                                                                                                                                                             |                                                                                     |
| non-unit fraction |                                                                                                                                                                                                                                                             |                                                                                     |
| equivalent        |                                                                                                                                                                                                                                                             |                                                                                     |
| halves            | <b>Equivalent Fractions</b><br> $\frac{1}{2}$ is equal to...<br>$\frac{1}{2} = \frac{2}{4} = \frac{3}{6} = \frac{4}{8} = \frac{5}{10} = \frac{6}{12}$                      |  |
| thirds            |                                                                                                                                                                                                                                                             |                                                                                     |
| quarters          |                                                                                                                                                                                                                                                             |                                                                                     |
| fifths            |                                                                                                                                                                                                                                                             |                                                                                     |
| sixths            |                                                                                                                                                                                                                                                             |                                                                                     |
| eighths           |                                                                                                                                                                                                                                                             |                                                                                     |
| tenths            |                                                                                                                                                                                                                                                             |                                                                                     |
| decimal tenths    |                                                                                                                                                                                                                                                             |                                                                                     |
|                   |  $\frac{1}{4}$ is equal to...<br>$\frac{1}{4} = \frac{2}{8} = \frac{3}{12} = \frac{4}{16} = \frac{5}{20}$                                                                |                                                                                     |
|                   |                                                                                                                                                                                                                                                             |                                                                                     |

| Fractions                                                                                                                     |                                                                                                                                                      | Knowledge Organiser |
|-------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|
| Add and Subtract Fractions                                                                                                    | Tenths                                                                                                                                               |                     |
| $\frac{2}{5} + \frac{1}{5} = \frac{3}{5}$  |                                                                  |                     |
| $\frac{3}{7} + \frac{2}{7} = \frac{5}{7}$  | <b>Fractions of Amounts</b><br>$\frac{1}{4} \text{ of } 24 = 6$  |                     |
| $\frac{5}{6} - \frac{2}{6} = \frac{3}{6}$  | $\frac{1}{3} \text{ of } 72 = 24$                                |                     |
|                                                                                                                               | $\frac{2}{5} \text{ of } 40 = 16$                                |                     |

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# Fractions: Stage 4

| Fractions         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Knowledge Organiser |
|-------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|
| Key Vocabulary    | Fraction Families                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                     |
| numerator         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                     |
| denominator       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                     |
| unit fraction     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                     |
| non-unit fraction |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                     |
| equivalent        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                     |
| quantities        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                     |
| whole             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                     |
| halves            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                     |
| thirds            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                     |
| quarters          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                     |
| fifths            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                     |
| sixths            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                     |
| sevenths          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                     |
| eighths           | Fractions of Quantities                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                     |
| ninths            | <p>To find a fraction of a number, divide by the denominator and multiply by numerator.</p>                                                                                                                                                                                                                                                                                                                                                                                                                  |                     |
| tenths            | <p>To find quarters of 20:</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                     |
| elevenths         | <p>To find eighths of 56:</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                     |
| twelfths          | <p>20 divided into 4 equal parts of 5 each.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                     |
| quantities        | <p>56 divided into 8 equal parts of 7 each.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                     |
|                   | <p> <math>\frac{1}{4}</math> of 20 = 5    <math>\frac{2}{4}</math> of 20 = 10    <math>\frac{3}{4}</math> of 20 = 15    <math>\frac{4}{4}</math> of 20 = 20               <math>\frac{1}{8}</math> of 56 = 7    <math>\frac{2}{8}</math> of 56 = 14    <math>\frac{3}{8}</math> of 56 = 21    <math>\frac{4}{8}</math> of 56 = 28<br/> <math>\frac{5}{8}</math> of 56 = 35    <math>\frac{6}{8}</math> of 56 = 42    <math>\frac{7}{8}</math> of 56 = 49    <math>\frac{8}{8}</math> of 56 = 56         </p> |                     |

Fractions

Knowledge Organiser

# Adding Fractions

Fractions can be added when the denominators are the same.

$$\frac{1}{3} + \frac{1}{3} = \frac{2}{3}$$

$$\frac{2}{8} + \frac{4}{8} + \frac{1}{8} = \frac{7}{8}$$

$$\frac{4}{5} + \frac{2}{5} = \frac{6}{5} \text{ or } 1\frac{1}{5}$$

# Subtracting fractions

Fractions can be subtracted when the denominators are the same.

$$\frac{3}{4} - \frac{2}{4} = \frac{1}{4}$$

$$\frac{8}{6} - \frac{5}{6} = \frac{3}{6}$$

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# Number and place Value: Stage 3

# Number and Place Value

# Knowledge Organiser

## Key Vocabulary

hundreds

tens

ones

zero

place value

greater than

less than

order

more

less

partition

digit

## 3-Digit Numbers

256

two hundred

200

fifty

50

six

6

## Counting in 4s and 8s

0 4 8 12 16 20 24 28 32 36 40

0 8 16 24 32 40 48 56 64 72 80

## 10 and 100 More or Less

Ten Less

120

Ten More

130

140

One Hundred Less

212

312

One Hundred More

412

## Counting in 50s and 100s

0 50 100 150 200 250 300 350 400 450 500

0 100 200 300 400 500 600 700 800 900 1000

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# Number and Place Value

# Knowledge Organiser

## Compare and Order

| 100s | 10s | 1s |
|------|-----|----|
|      |     |    |

324 > 243

greater than

| 100s | 10s | 1s |
|------|-----|----|
|      |     |    |

|  |  |
|--|--|
|  |  |
|--|--|

79 < 126

less than

|  |  |  |
|--|--|--|
|  |  |  |
|--|--|--|

smallest

greatest

497 508 512 521 602

500 600

## Represent Numbers to 1000

**587**

five hundred and eighty-seven

| Hundreds | Tens | Ones |
|----------|------|------|
|          |      |      |

$$500 + 80 + 7$$

587

500 80 7

| Hundreds | Tens | Ones |
|----------|------|------|
|          |      |      |

## Numerals and Words to 1000

0 100 200 300 400 500 600 700 800 900 1000

zero one hundred two hundred three hundred four hundred five hundred six hundred seven hundred eight hundred nine hundred one thousand

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# Number and place Value: Stage 4

| Number and Place Value |  |                   |      |      |      | Knowledge Organiser |      |      |      |      |      |        |
|------------------------|--|-------------------|------|------|------|---------------------|------|------|------|------|------|--------|
| Key Vocabulary         |  | Counting          |      |      |      |                     |      |      |      |      |      |        |
| thousands              |  | Counting in 6s    |      |      |      |                     |      |      |      |      |      |        |
| hundreds               |  | 0                 | 6    | 12   | 18   | 24                  | 30   | 36   | 42   | 48   | 54   | 60     |
| tens                   |  | Counting in 7s    |      |      |      |                     |      |      |      |      |      |        |
| ones                   |  | 0                 | 7    | 14   | 21   | 28                  | 35   | 42   | 49   | 56   | 63   | 70     |
| zero                   |  | Counting in 9s    |      |      |      |                     |      |      |      |      |      |        |
| place value            |  | 0                 | 9    | 18   | 27   | 36                  | 45   | 54   | 63   | 72   | 81   | 90     |
| greater than           |  | Counting in 25s   |      |      |      |                     |      |      |      |      |      |        |
| less than              |  | 0                 | 25   | 50   | 75   | 100                 | 125  | 150  | 175  | 200  | 225  | 250    |
| order                  |  | Counting in 1000s |      |      |      |                     |      |      |      |      |      |        |
| round                  |  | 0                 | 1000 | 2000 | 3000 | 4000                | 5000 | 6000 | 7000 | 8000 | 9000 | 10 000 |
| rounded to             |  |                   |      |      |      |                     |      |      |      |      |      |        |
| negative number        |  |                   |      |      |      |                     |      |      |      |      |      |        |
| partition              |  |                   |      |      |      |                     |      |      |      |      |      |        |
| digit                  |  |                   |      |      |      |                     |      |      |      |      |      |        |
| Roman numeral          |  |                   |      |      |      |                     |      |      |      |      |      |        |
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Number and Place Value

Knowledge Organiser

Negative Numbers

Represent 4-Digit Numbers

3487

three thousand, four hundred and eighty-seven

| 1000s | 100s | 10s | 1s |
|-------|------|-----|----|
|       |      |     |    |

| Thousands | Hundreds | Tens | Ones |
|-----------|----------|------|------|
|           |          |      |      |

Roman Numerals

|             |     |   |
|-------------|-----|---|
| one         | 1   | I |
| five        | 5   | V |
| ten         | 10  | X |
| fifty       | 50  | L |
| one hundred | 100 | C |

XVIII = 18  
XXIX = 29  
LXXXIV = 84

Rounding

Look at the place value column to the right of the value you are rounding to. If this digit is a 4 or less, round down. If the digit is a 5 or more, round up.

Rounding to nearest 10

|              |    |    |    |    |            |    |    |    |    |    |
|--------------|----|----|----|----|------------|----|----|----|----|----|
| 20           | 21 | 22 | 23 | 24 | 25         | 26 | 27 | 28 | 29 | 30 |
| ← round down |    |    |    |    | round up → |    |    |    |    |    |

Rounding to the nearest 100

|              |     |            |     |
|--------------|-----|------------|-----|
| 200          | 249 | 250        | 300 |
| ← round down |     | round up → |     |

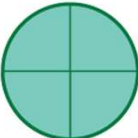
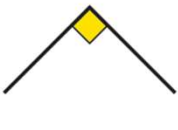
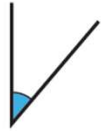
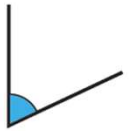
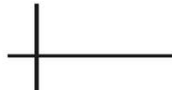
Rounding to the nearest 1000

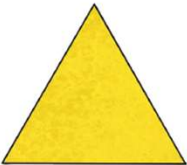
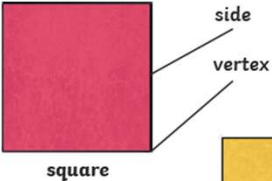
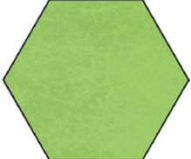
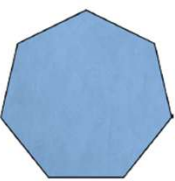
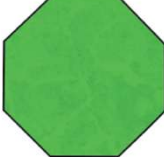
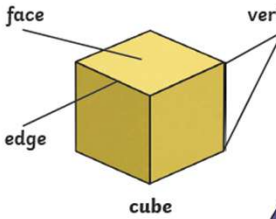
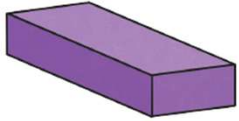
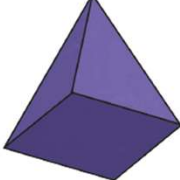
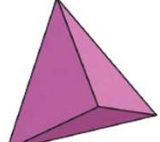
|              |      |            |      |
|--------------|------|------------|------|
| 2000         | 2499 | 2500       | 3000 |
| ← round down |      | round up → |      |

visit [twinkl.com](https://www.twinkl.com)

# Properties of Shape:

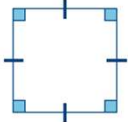
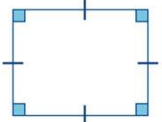
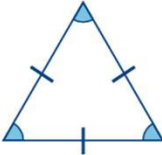
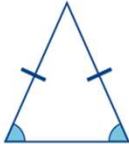
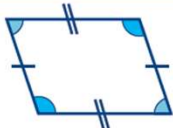
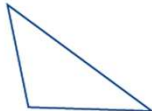
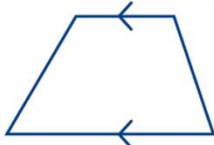
## Stage 3

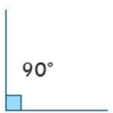
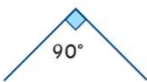
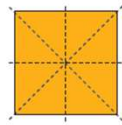
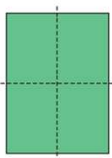
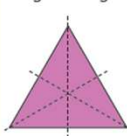
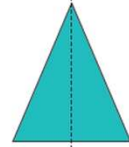
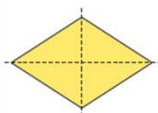
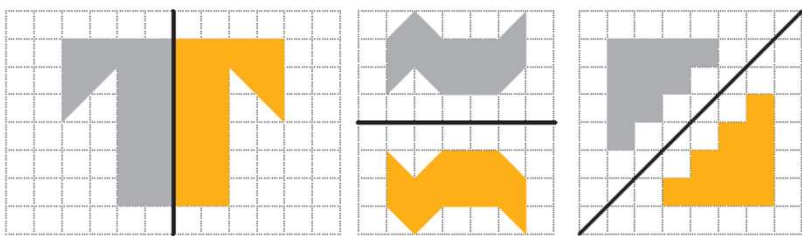
| Properties of Shapes                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Knowledge Organiser                                                                  |                                                                                       |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| Key Vocabulary                                                                                                                                                                                                                                                                           | Turns and Angles                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                      |                                                                                       |
| quarter turn<br>half turn<br>three-quarter turn<br>angle<br>right angle<br>acute<br>obtuse<br>horizontal<br>vertical<br>parallel<br>perpendicular<br>polygon<br>two-dimensional<br>three-dimensional<br>flat face<br>curved surface<br>edge<br>curved edge<br>vertex<br>vertices<br>apex | <p>Angles can be used as a description of a turn.</p> <div><div><br/><math>\frac{1}{4}</math> turn</div><div><br/><math>\frac{1}{2}</math> turn</div><div><br/><math>\frac{3}{4}</math> turn</div><div><br/>1 turn</div><div><br/>clockwise</div><div><br/>anticlockwise</div></div> |                                                                                      |                                                                                       |
|                                                                                                                                                                                                                                                                                          | <p>An angle is created when two straight lines meet at a point or intersect.</p> <div><div><p>Right Angle</p></div><div><p>Acute Angle<br/>Less than 90°</p></div><div><p>Obtuse Angle<br/>Greater than 90° and less than 180°</p></div></div>                                                                                                                    |                                                                                      |                                                                                       |
| Type of Lines                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                      |                                                                                       |
| horizontal                                                                                                                                                                                                                                                                               | vertical                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | parallel                                                                             | perpendicular                                                                         |
|                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |  |  |
|  visit <a href="https://www.twinkl.com">twinkl.com</a>                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                      |                                                                                       |

| Properties of Shapes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |  | Knowledge Organiser                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |  |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
| Recognise and Describe 2D Shapes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |  | Recognise and Describe 3D Shapes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |  |
| <div>  <p>triangle</p> </div> <div>  <p>square</p> </div> <div>  <p>rectangle</p> </div> <div>  <p>hexagon</p> </div> <div>  <p>pentagon</p> </div> <div>  <p>heptagon</p> </div> <div>  <p>octagon</p> </div> |  | <div>  <p>cube</p> </div> <div>  <p>cuboid</p> </div> <div>  <p>cylinder</p> </div> <div>  <p>square-based pyramid</p> </div> <div>  <p>tetrahedron</p> </div> <div>  <p>triangular prism</p> </div> <div>  <p>sphere</p> </div> |  |

# Properties of Shape:

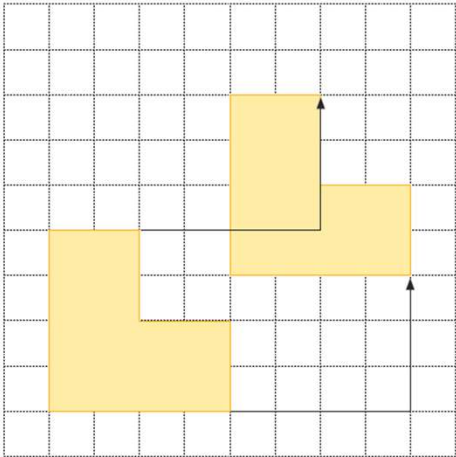
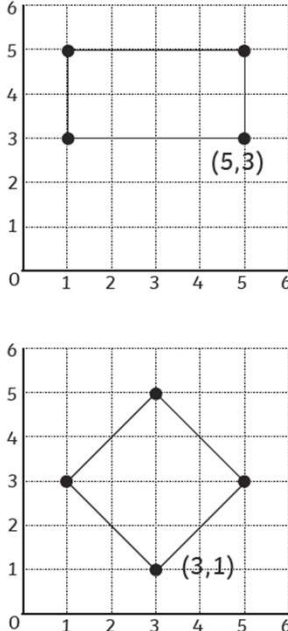
## Stage 4

| Properties of Shape                                                                                                                       |                                                                                               | Knowledge Organiser                                                                                                                        |                                                                                     |
|-------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Key Vocabulary                                                                                                                            | Triangles                                                                                     | Quadrilaterals                                                                                                                             |                                                                                     |
| angle                                                                                                                                     | Triangles have 3 sides and 3 vertices. The total of the angles in a triangle is $180^\circ$ . | A quadrilateral is a polygon with four sides.                                                                                              |                                                                                     |
| right angle                                                                                                                               |                                                                                               |                                                          |  |
| acute                                                                                                                                     |              | A square has four sides of equal length and four right angles ( $90^\circ$ ). A square is also a rectangle, a rhombus and a parallelogram. |                                                                                     |
| obtuse                                                                                                                                    |                                                                                               | A rectangle has two pairs of parallel, equal sides and four right angles. A rectangle is also a parallelogram.                             |                                                                                     |
| horizontal                                                                                                                                |              |                                                          |                                                                                     |
| vertical                                                                                                                                  |                                                                                               |                                                         |                                                                                     |
| diagonal                                                                                                                                  |             | A parallelogram has two pairs of parallel, equal sides and opposite equal angles.                                                          |                                                                                     |
| parallel                                                                                                                                  |                                                                                               | A rhombus has four sides of equal length and opposite equal angles. A rhombus is also a parallelogram.                                     |                                                                                     |
| perpendicular                                                                                                                             |            |                                                        |                                                                                     |
| two-dimensional                                                                                                                           |                                                                                               | A kite has two pairs of adjacent equal sides and one pair of opposite equal angles.                                                        |                                                                                     |
| polygon                                                                                                                                   | A scalene triangle has no equal sides or angles.                                              | A trapezium only has one pair of opposite parallel sides.                                                                                  |                                                                                     |
| line of symmetry                                                                                                                          |                                                                                               |                                                                                                                                            |                                                                                     |
| reflection                                                                                                                                |                                                                                               |                                                                                                                                            |                                                                                     |
| mirror line                                                                                                                               |                                                                                               |                                                                                                                                            |                                                                                     |
| isosceles                                                                                                                                 |                                                                                               |                                                                                                                                            |                                                                                     |
| equilateral                                                                                                                               |                                                                                               |                                                                                                                                            |                                                                                     |
| scalene                                                                                                                                   |                                                                                               |                                                                                                                                            |                                                                                     |
| quadrilateral                                                                                                                             |                                                                                               |                                                                                                                                            |                                                                                     |
| rhombus                                                                                                                                   |                                                                                               |                                                                                                                                            |                                                                                     |
| parallelogram                                                                                                                             |                                                                                               |                                                                                                                                            |                                                                                     |
| trapezium                                                                                                                                 |                                                                                               |                                                                                                                                            |                                                                                     |
|  visit <a href="https://www.twinkl.com">twinkl.com</a> |                                                                                               |                                                                                                                                            |                                                                                     |

| Properties of Shape                                                                                                                                                                                                                                                                                                                                      |  | Knowledge Organiser                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
| Angles                                                                                                                                                                                                                                                                                                                                                   |  | Lines of Symmetry                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |  |
| <p>An angle is created when two straight lines meet at a point or intersect.</p> <p><b>Right angle</b></p> <p>The intersection of perpendicular lines creates a right angle.</p>   |  | <p>Lines of symmetry may be horizontal, vertical or diagonal. Some 2D shapes will have no lines of symmetry and some 2D shapes will have multiple lines of symmetry.</p> <div><p>A square has four lines of symmetry.</p></div> <div><p>A rectangle has two lines of symmetry.</p></div> <div><p>An equilateral triangle has three lines of symmetry.</p></div> <div><p>An isosceles triangle has one line of symmetry.</p></div> <div><p>A rhombus has two lines of symmetry.</p></div> |  |
| Symmetric Figures                                                                                                                                                                                                                                                                                                                                        |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |  |
| <p>Patterns and shapes can be reflected in a mirror line. Mirror lines can be vertical, horizontal or diagonal.</p>                                                                                                                                                  |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |  |
|  visit <a href="https://www.twinkl.com">twinkl.com</a>                                                                                                                                                                                                                |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |  |

# Position and Direction: Stage 4

| Position and Direction                                                                                                                    |                                                                                                                                                                                                        | Knowledge Organiser                                                           |
|-------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------|
| Key Vocabulary                                                                                                                            | Position in the First Quadrant                                                                                                                                                                         |                                                                               |
| coordinate                                                                                                                                |                                                                                                                                                                                                        | Coordinates are a useful way to locate a position on a map or grid.           |
| quadrant                                                                                                                                  |                                                                                                                                                                                                        | The numbers across the horizontal line of the grid are on the <b>x-axis</b> . |
| x-axis                                                                                                                                    |                                                                                                                                                                                                        | The numbers on the vertical line of the grid are on the <b>y-axis</b> .       |
| y-axis                                                                                                                                    |                                                                                                                                                                                                        | We always read or write the number on the x-axis before the <b>y-axis</b> .   |
| translation                                                                                                                               |                                                                                                                                                                                                        | The x and y position are written in brackets with a comma.                    |
|                                                                                                                                           |                                                                                                                                                                                                        | The coordinate of the blue spot is <b>(2, 3)</b> .                            |
| vertex                                                                                                                                    | <p>To help you remember which point to read or write first, simply remember to move 'along the corridor and up the stairs'.</p> <p>In other words, move on the x-axis and then move on the y-axis.</p> |                                                                               |
| vertices                                                                                                                                  |                                                                                                                                                                                                        |                                                                               |
|                                                                                                                                           |                                                                                                                                                                                                        |                                                                               |
|  visit <a href="https://www.twinkl.com">twinkl.com</a> |                                                                                                                                                                                                        |                                                                               |

| Position and Direction                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                   | Knowledge Organiser |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|
| Translation                                                                                                                                                                                                                                                                                                     | Plotting 2D Shapes                                                                                                                                                                |                     |
| <p>In maths, translation means moving an object on a grid. The object is moved without changing the size, turning or reflecting it.</p> <p>When translating an object on a grid, it can move up or down, left or right.</p>  | <p>Each vertex (corner) of a 2D polygon can be represented as a coordinate on a 2D grid.</p>  |                     |
|  visit <a href="https://www.twinkl.com">twinkl.com</a>                                                                                                                                                                       |                                                                                                                                                                                   |                     |