MIXED DIFFICULTY QUESTIONS – Various topics

1. Use simple formulae.
2. Generate and describe linear number sequences.
3. Express missing number problems algebraically.
4. Find pairs of numbers that satisfy an equation with two unknowns.
5. Enumerate possibilities of combinations of two variables.

1. Use simple formulae.

a) Calculate the value of the letter in each equation:

$3a = 18$	$a =$
$63 = 9b$	$b =$
$5c = 95$	$c =$

b) Calculate the value of the letter in each equation:

$4d - 3 = 5$	$d =$
$68 = 5e + 8$	$e =$
$34 - 6f = 10$	$f =$

c) In these equations, **x** is worth 7. Calculate the value of **y**.

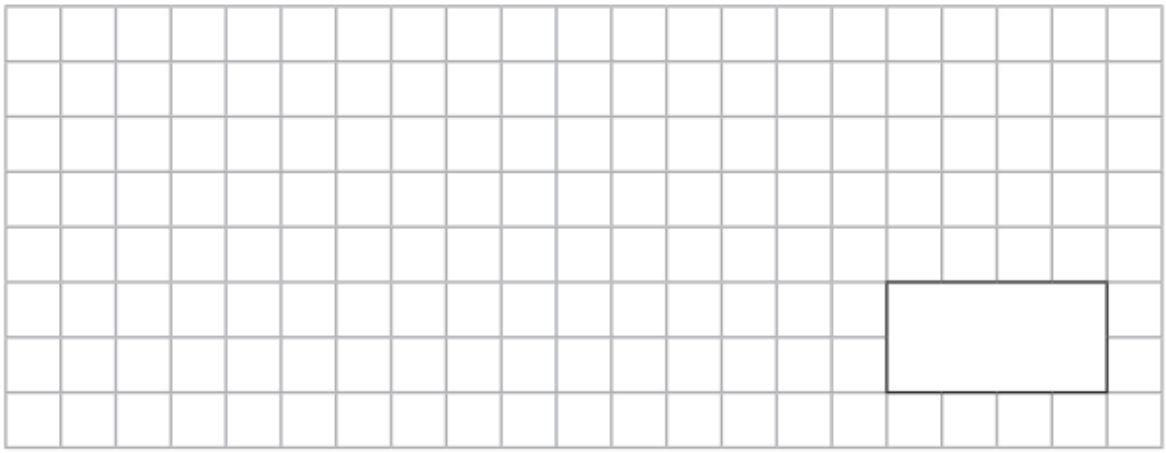
$y = 2x + 13$	$y =$
$100 - 7x = y$	$y =$
$y = x^2$	$y =$

d) The cost of a producing a pack of rubbers is calculated as follows:

Cost = number of rubbers x 11p + 6p for the box.

How much will a pack of 12 rubbers cost to produce?

A pack of rubbers costs £3.36. How many rubbers are in the pack?



2. Generate and describe linear number sequences.

a) Fill in the first two terms in this sequence:

		102	111	120

b) 9 is the first term in this sequence. What is the tenth term?

9 15 21 27

c) Find the missing numbers in this linear sequence:

41			53

d) The formula **4n + 9** can be used to calculate the value of the terms in this sequence:

13 17 21 25 29

Complete this table.

term	**calculation**	**value**
1st	4 x 1 + 9	13
5th		
20th		89
100th	4 x 100 + 9	

e) The sequence 1, 4, 7, 10 can be expressed as **3n - 2**, where **n** is the term.

i. Express the sequence 1, 6, 11, 16 where **n** is the term.

ii. What is the 15th term?

iii. Which term is 121?

3. Express missing number problems algebraically.

a) A locksmith uses the following charges: £12 callout charge and £15 per hour of work. Circle the formula that could be used to calculate how much the locksmith will charge for each job.

h stands for the number of hours.

12h + 15 | 12h - 15 | 15h + 12 | 15h - 12

b) The number **p** is 8 more than the number **q**.

Write 2 algebraic expressions to show the relationship between p and q, using different operations.

c) Circle any expression that is an accurate simplification of the expression a + b + a + b:

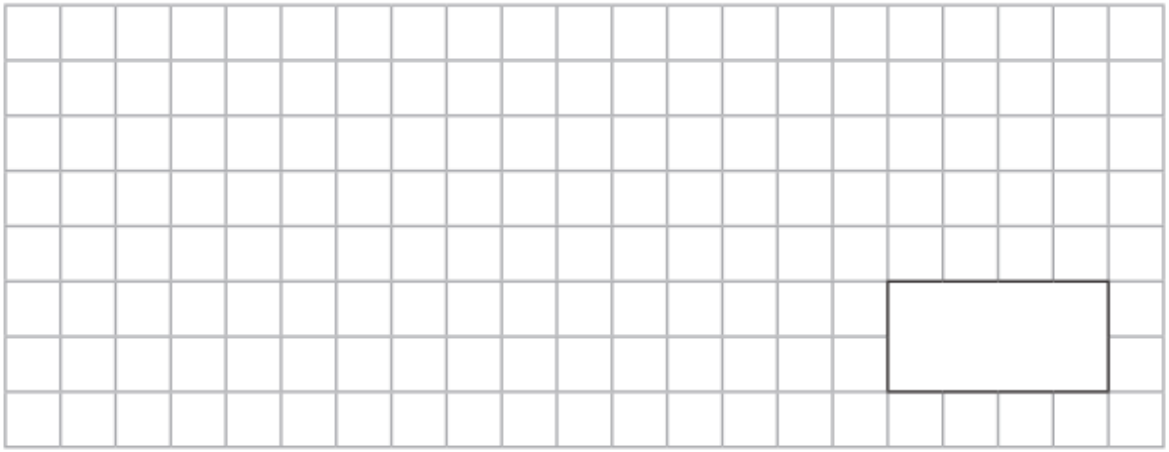
2a + 2b | 2(b + a) | 2b + 2a | 2(a + b)

d) An online shop sells wellington boots for £7, with £6 for delivery. To calculate the cost of each order the shop uses the following formula:

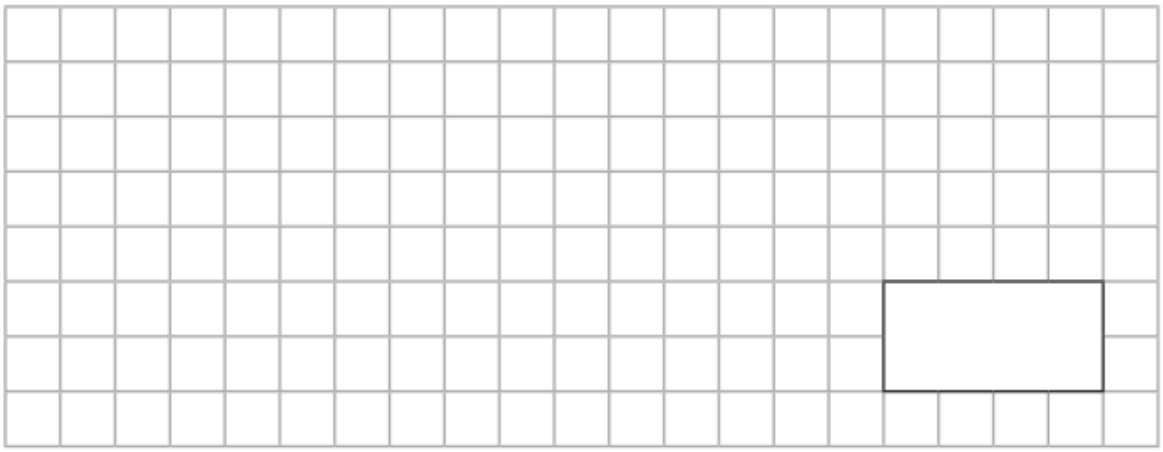
7n + 6

n stands for the number of pairs of wellington boots in each order.

i. Calculate the cost of ordering 8 pairs of wellington boots.



ii. A residential outdoor centre places an order costing £251. Calculate how many pairs of wellington boots are ordered.



e) A gardener charges £15 per hour for his work, but offers a discount of £5 if paid on the day of work.

Write the formula the gardener would use for calculating what to charge for any work paid on the day.
Use **n** to represent the number of hours worked.

4. Find pairs of numbers that satisfy an equation with two unknowns.

a) Find 3 different possible pairs of values for a and b in this equation, where a and b are whole numbers:

ab = 30

Value of a	Value of b

b) Find 3 different possible pairs of values for a and b in this equation, where a and b are whole numbers:

ab + 14 = 26

Value of a	Value of b

c) Calculate the value of each letter:

$ef = 35$ $\quad e + f = 12$ $\quad e > f$	e = …… f = ……
$g - h = 7$ $\quad g + h = 15$	g = …… h = ……
$2i - j = 12$ $\quad 2j + j = 24$	i = …… j = ……

5. Enumerate possibilities of combinations of two variables.

In this equation, **a** and **b** are different whole numbers that are between 20 and 32.

a) Write the calculations that would show all the possible values of a and b.

a + 9 = b

b) Use this equation to fill in the missing information in the table below:

2a + 5 = b

Value of a	Value of b
	11
6	
10	
	41

ANSWERS

<table>
<tr><th>question</th><th>answer</th><th>marks</th><th>notes</th></tr>
<tr><td colspan="4">1. Use simple formulae.</td></tr>
<tr><td>a</td><td>a = 6, b = 7, c = 19</td><td>3</td><td></td></tr>
<tr><td>b</td><td>d = 2, e = 12, f = 4</td><td>3</td><td></td></tr>
<tr><td>c</td><td>y = 27, y = 51, y = 49</td><td>3</td><td></td></tr>
<tr><td>d</td><td>£1.38
30 rubbers</td><td>3</td><td>For the second part, 2 marks for a correct answer, but 1 mark for correct calculations with only 1 error in calculating.</td></tr>
<tr><td colspan="4">2. Generate and describe linear number sequences.</td></tr>
<tr><td>a</td><td>84, 93</td><td>1</td><td></td></tr>
<tr><td>b</td><td>63</td><td>1</td><td></td></tr>
<tr><td>c</td><td>45, 49</td><td>1</td><td></td></tr>
<tr><td>d</td><td><table><tr><th>term</th><th>calculation</th><th>value</th></tr><tr><td>1st</td><td>3 x 1 - 7</td><td>-4</td></tr><tr><td>5th</td><td>4 x 5 + 9</td><td>29</td></tr><tr><td>10th</td><td>4 x 20 + 9</td><td>89</td></tr><tr><td>25th</td><td>4 x 100 + 9</td><td>409</td></tr></table></td><td>4</td><td>Award one mark for each box correctly completed.</td></tr>
<tr><td>e</td><td>5n-4
71
25th term</td><td>3</td><td></td></tr>
<tr><td colspan="4">3. Express missing number problems algebraically.</td></tr>
<tr><td>a</td><td>15h + 12</td><td>1</td><td></td></tr>
<tr><td>b</td><td>p = q + 8 and p - 8 = q</td><td>2</td><td>Allow any expression which is correct (p + 1 = q – 9).</td></tr>
<tr><td>c</td><td>All must be ringed</td><td>1</td><td></td></tr>
<tr><td>di.</td><td>£62</td><td>1</td><td rowspan="2">For the second part, 2 marks for a correct answer, but 1 mark for correct calculations with only 1 error in calculating.</td></tr>
<tr><td>ii.</td><td>35 pairs</td><td>2</td></tr>
<tr><td>e</td><td>15n – 5</td><td>1</td><td></td></tr>
</table>

<table>
<tr><th>question</th><th>answer</th><th>marks</th><th>notes</th></tr>
<tr><td colspan="4">4. Find pairs of numbers that satisfy an equation with two unknowns.</td></tr>
<tr><td>a</td><td>1 x 30, 2 x 15, 5 x 6</td><td>1</td><td>1 mark for all 3 pairs.</td></tr>
<tr><td>b</td><td>1 x 12, 2 x 6, 3 x 4</td><td>1</td><td>1 mark for all 3 pairs.</td></tr>
<tr><td>c</td><td>e = 7, f = 5
g = 11, h = 4
l = 10, j = 8</td><td>3</td><td>1 mark for each correct pair.</td></tr>
<tr><td colspan="4">5. Enumerate possibilities of combinations of two variables.</td></tr>
<tr><td></td><td>21 + 9 = 30
22 + 9 = 31</td><td>1</td><td>1 mark for all 3 correct combinations identified.</td></tr>
<tr><td></td><td><table><tr><th>Value of a</th><th>Value of b</th></tr><tr><td>3</td><td>11</td></tr><tr><td>6</td><td>17</td></tr><tr><td>10</td><td>25</td></tr><tr><td>18</td><td>41</td></tr></table></td><td>4</td><td></td></tr>
<tr><td colspan="2"></td><td>Total
40</td><td></td></tr>
</table>

FRACTIONS, DECIMALS AND PERCENTAGES:

Match the following decimal numbers, percentages and fractions.

0.3	50%	$\frac{2}{5}$	0.25	$\frac{1}{2}$	12.5%
0.5	40%	$\frac{1}{5}$	0.375	$\frac{1}{8}$	50%
0.4	70%	$\frac{7}{10}$	0.75	$\frac{7}{8}$	87.5%
0.7	20%	$\frac{1}{2}$	0.5	$\frac{3}{8}$	25%
0.9	30%	$\frac{9}{10}$	0.125	$\frac{1}{4}$	75%
0.2	90%	$\frac{3}{10}$	0.875	$\frac{3}{4}$	37.5%

Write the equivalent fraction (in its simplest form) to the following:

75% =	30% =	15% =	90% =	50% =	35% =
0.6 =	0.95 =	0.1 =	0.25 =	0.625 =	0.2 =
25% =	0.9 =	0.5 =	5% =	0.4 =	85% =

Write the equivalent decimal and percentage to the following:

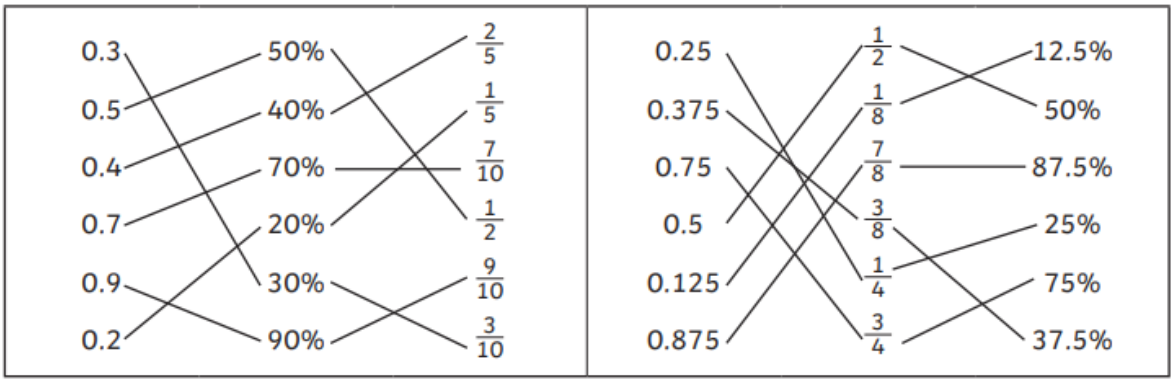
$\frac{1}{2}$ =	$\frac{3}{4}$ =	$\frac{1}{5}$ =	$\frac{1}{3}$ =
$\frac{4}{5}$ =	$\frac{3}{8}$ =	$\frac{1}{10}$ =	$\frac{1}{6}$ =
$\frac{7}{10}$ =	$\frac{2}{5}$ =	$\frac{5}{8}$ =	$\frac{7}{20}$ =

Write the missing equivalent fraction (in its simplest form), decimal or percentage as needed.

0.7 =	$\frac{1}{8}$ =	75% =
20% =	0.01 =	$\frac{2}{3}$ =

ANSWERS:

Match the following decimal numbers, percentages and fractions.



Write the equivalent fraction (in its simplest form) to the following:

75% = **$\frac{3}{4}$**	30% = **$\frac{3}{10}$**	15% = **$\frac{3}{20}$**	90% = **$\frac{9}{10}$**	50% = **$\frac{1}{2}$**	35% = **$\frac{7}{20}$**
0.6 = **$\frac{3}{5}$**	0.95 = **$\frac{19}{20}$**	0.1 = **$\frac{1}{10}$**	0.25 = **$\frac{1}{4}$**	0.625 = **$\frac{5}{8}$**	0.2 = **$\frac{1}{5}$**
25% = **$\frac{1}{4}$**	0.9 = **$\frac{9}{10}$**	0.5 = **$\frac{1}{2}$**	5% = **$\frac{1}{20}$**	0.4 = **$\frac{2}{5}$**	85% = **$\frac{17}{20}$**

Write the equivalent decimal and percentage to the following:

$\frac{1}{2}$ = 0.5 = 50%	**$\frac{3}{4}$ = 0.75 = 75%**	**$\frac{1}{5}$ = 0.2 = 20%**	**$\frac{1}{3}$ = 0.33 = 33.3%**
$\frac{4}{5}$ = 0.8 = 80%	**$\frac{3}{8}$ = 0.375 = 37.5%**	**$\frac{1}{10}$ = 0.1 = 10%**	**$\frac{1}{6}$ = 0.166 = 16.6%**
$\frac{7}{10}$ = 0.7 = 70%	**$\frac{2}{5}$ = 0.4 = 40%**	**$\frac{5}{8}$ = 0.625 = 62.5%**	**$\frac{7}{20}$ = 0.35 = 35%**

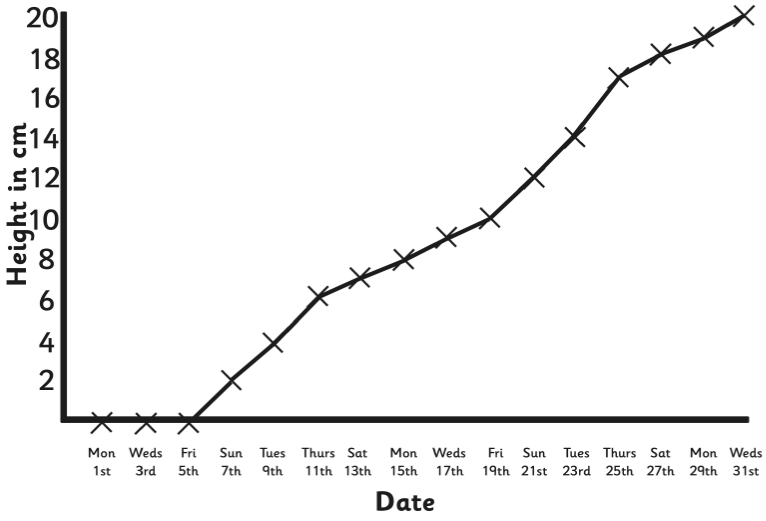
Write the missing equivalent fraction (in its simplest form), decimal or percentage as needed.

0.7 = **$\frac{7}{10}$** = **70%**	**$\frac{1}{8}$** = **0.125** = **12.5%**	75% = **$\frac{3}{4}$** = **0.75**
20% = **$\frac{1}{5}$** = **0.2**	0.01 = **$\frac{1}{100}$** = **1%**	**$\frac{2}{3}$** = **0.66** = **66.6%**

* **Allow equivalent fractions and rounding as appropriate for thirds and sixths**

GRAPHS AND CHARTS:

Here is a line graph showing a sunflower's growth. Its height was measured every 2 days.



Questions

1. How many days did the plant take to grow to 18cm?

_____

2. What is the height difference between Friday 19th and Thurs 25th? _____

3. Why is there no measurement in the first week?

_____

4. What is the height of the plant on these days:

a) Thurs 11th _____

b) Friday 19th _____

c) Monday 29th _____

Here is a tally chart of the eye colours of people in a class:

Eye Colour	Number
Brown	𝍸 𝍸 𝍸
Blue	𝍸 ||
Green	𝍸 𝍸
Grey	|||
Hazel	||||

Questions

1. How many children have green eyes? _____

2. How many children have grey or hazel eyes? _____

3. What is the least common eye colour? _____

4. What is the most common eye colour? _____

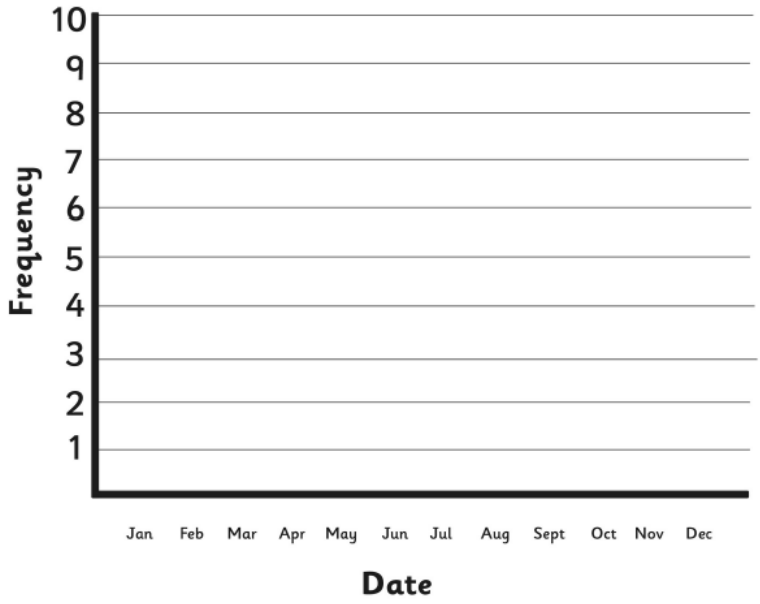
5. What is the difference between the most and least common eye colour? _____

6. How many more people have brown eyes than green eyes? _____

Here is a tally chart of the birthdays of people in a class:

Month	Tally
January	𝍸
February	𝍸 ||
March	𝍸 𝍸
April	|||
May	||||
June	𝍸
July	𝍸
August	||||
September	𝍸
October	||||
November	|||
December	𝍸

Using the tally chart, complete this bar line chart:



Questions:

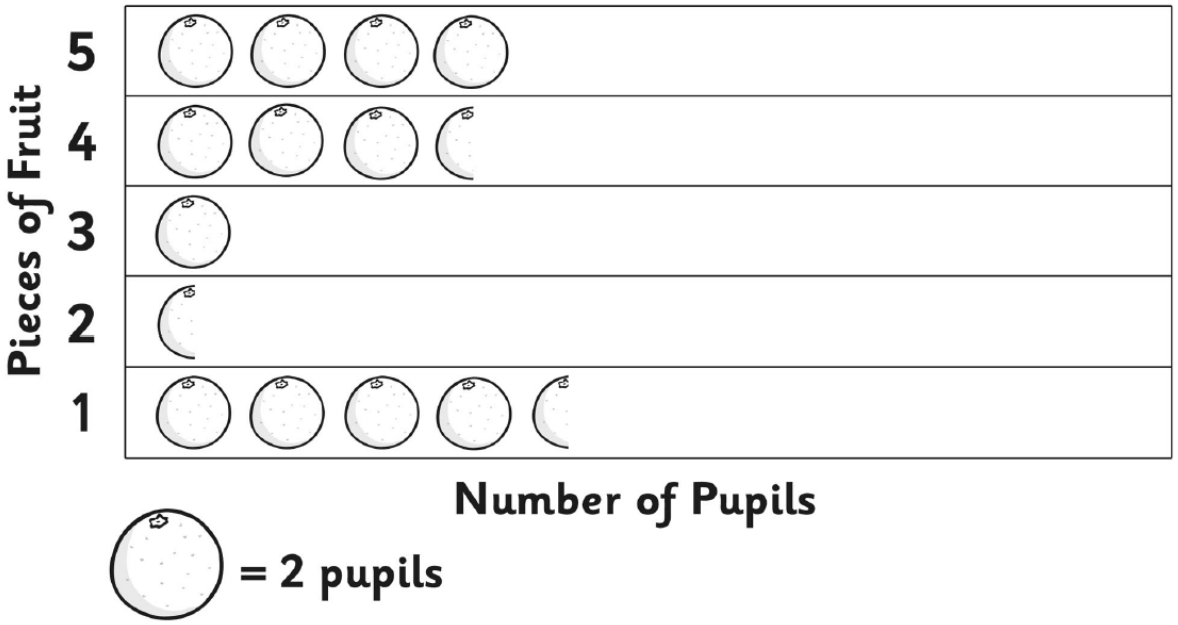
1. What is the mode, or average number of birthdays?_____
2. Which month has the most birthdays? _____
3. How many people have birthdays between April and July? _____
4. How many people have birthdays between August and December? _____
5. Which month has the least birthdays? _____

Here is a table of the chocolate bars sold to customers in a shop over 4 days:

	Monday	Tuesday	Wednesday	Thursday
Mars	2	1	3	4
Twix	0	2	2	3
Galaxy	5	3	2	0
Milkyway	2	2	2	2
Bounty	1	3	5	0
Lion	6	3	4	1
Snickers	1	3	2	2

1. Now draw a bar line chart to show these results.

Here is a pictogram showing how many pieces of fruit that pupils in a class had eaten in one day so far:



= 2 pupils

1. Draw a frequency table for the results.

2. Now draw a line bar chart from your frequency table.

ANSWERS:

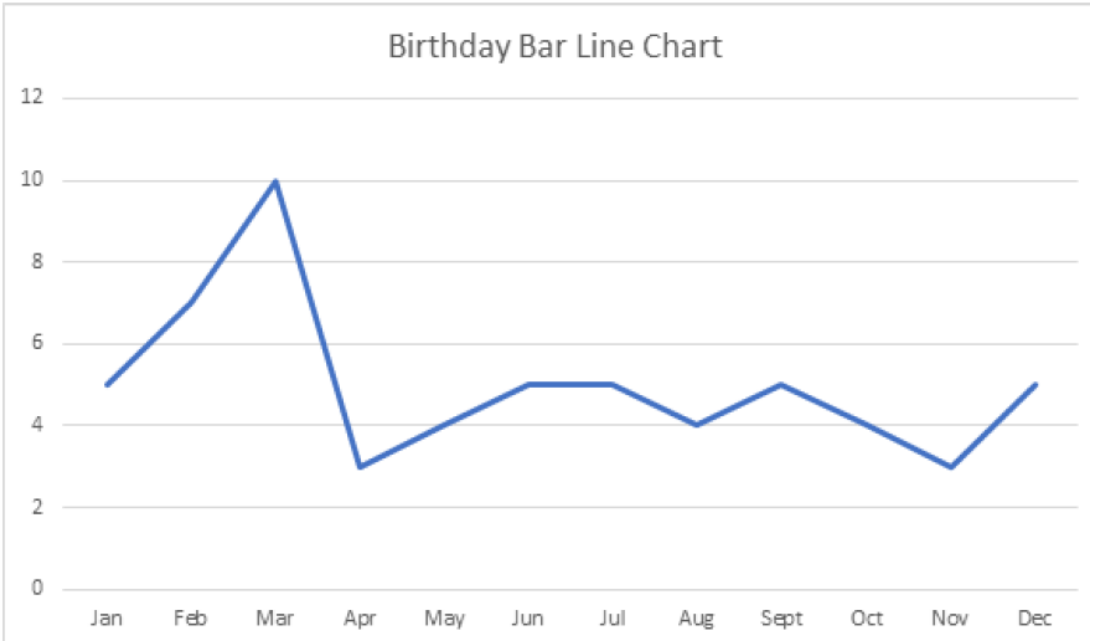
Sunflower Line Graph Worksheet

1. 25 days
2. 10 cm
3. The seed had not grown yet.
4. a. 7 cm
   b. 10 cm
   c. 19 cm

Eye Colour Survey Worksheet

1. 10
2. 7
3. Grey
4. Brown
5. 12
6. 5

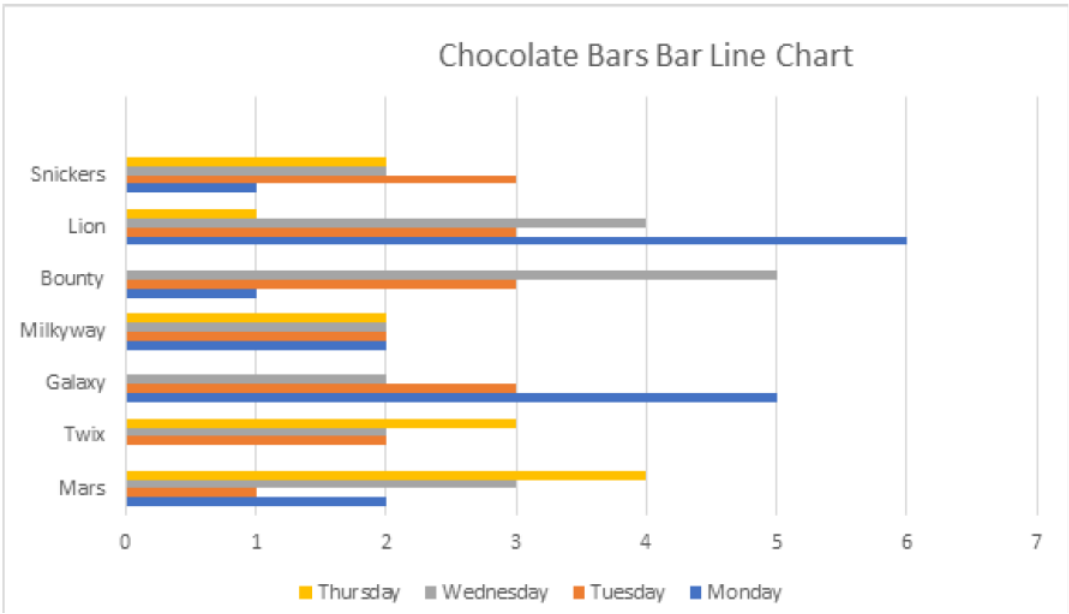
Birthdays Bar Line Chart Display Worksheet



1. Mode: 5 Average: 5
2. March
3. 17 people
4. 21 people
5. April and November

Birthdays Bar Line Chart Display Worksheet

1. An example of the bar line chart.



5 a Day Frequency Table Worksheet

1. Frequency table

Pieces of Fruit	Students
1	9
2	1
3	2
4	7
5	8

2. An example of a line bar chart

MENTAL CALCULATIONS:

Performing Mental Calculations **Worksheet**

Mental arithmetic only! No calculators or written methods.

1. Calculate the following additions and subtractions:

   a. 23 + 47 = _____
   b. 39 + 53 = _____
   c. 76 – 18 = _____
   d. 46 + 25 = _____
   e. 138 – 27 = _____
   f. 87 + 24 = _____
   g. 116 + 54 = _____
   h. 176 – 39 = _____

2. Calculate the following multiplications:

   a. 20 × 30 = _____
   b. 500 × 300 = _____
   c. 20 × 600 = _____
   d. 520 × 200 = _____
   e. 120 × 6000 = _____
   f. 8 × 90 000 = _____
   g. 600 × 500 = _____
   h. 40 000 × 2000 = _____

3. Calculate the following multiplications:

   a. 52 × 6 = _____
   b. 98 × 9 = _____
   c. 37 × 7 = _____
   d. 28 × 8 = _____

4. Calculate the following divisions:

   a. 275 ÷ 5 = _____
   b. 92 ÷ 4 = _____
   c. 525 ÷ 25 = _____
   d. 624 ÷ 12 = _____

5. Find each missing number:

   a. _____ × 5 = 30
   b. _____ × 50 = 300
   c. _____ × 50 = 3000
   d. _____ × 5000 = 30 000
   e. 6 × _____ = 300 000

6. Find each missing number:

   a. 28 ÷ 7 = _____
   b. 280 ÷ _____ = 40
   c. 280 ÷ _____ = 4
   d. _____ ÷ 7 = 400
   e. _____ ÷ 7 = 4000
   f. 28 000 000 ÷ 7 = _____

7. Use the following information to fill in the missing numbers below:

   $3.5 \times 2.1 = 7.35$

   a. $35 \times$ _____ $= 73.5$

   b. $35 \times$ _____ $= 735$

   c. _____ $\times 21 = 73\,500$

   d. $350 \times$ _____ $= 73\,500$

   e. $0.35 \times$ _____ $= 735\,000$

8. Use the following information to fill in the missing numbers below:

   $5.8 \times 6.3 = 36.54$

   a. $58 \times 6.3 =$ _____

   b. $5.8 \times 630 =$ _____

   c. $580 \times 63 =$ _____

   d. $5800 \times 630 =$ _____

   e. $0.58 \times 63 =$ _____

9. Estimate the answer to:

   a. $168 + 2573 =$ _____

   b. $52 \times 19 =$ _____

   c. $984 \div 22 =$ _____

10. Amy has calculated $655 \div 21 = 3.12$. Without calculating the exact answer, show that Amy must be wrong.

    _____

    _____

    _____

11. A trolley has a weight limit of 100kg. You have 3 boxes, each weighing 35kg. In total, are these above or below the weight limit?

    _____

    _____

12. On your journey to work, you walk for 16 minutes, spend 35 minutes on the train and then take a 13-minute bus journey. You spend a total of 10 minutes waiting at stops. How long does your journey to work take?

    _____

Challenge

In a shop, a pencil costs 29p, a ruler costs 33p and a set of pens costs £1.19. You buy five pencils, a ruler and a set of pens and pay with a £5 note. How much change should you receive, in pounds?

_____

_____

_____

_____

_____

ANSWERS:

Performing Mental Calculations **Answers**

Mental arithmetic only! No calculators or written methods.

1. Calculate the following additions and subtractions:

   a. 23 + 47 = **70**

   b. 39 + 53 = **92**

   c. 76 – 18 = **58**

   d. 46 + 25 = **71**

   e. 138 – 27 = **111**

   f. 87 + 24 = **111**

   g. 116 + 54 = **170**

   h. 176 – 39 = **137**

2. Calculate the following multiplications:

   a. 20 × 30 = **600**

   b. 500 × 300 = **150 000**

   c. 20 × 600 = **12 000**

   d. 520 × 200 = **104 000**

   e. 120 × 6000 = **720 000**

   f. 8 × 90 000 = **720 000**

   g. 600 × 500 = **300 000**

   h. 40 000 × 2000 = **80 000 000**

3. Calculate the following multiplications:

   a. 52 × 6 = **312**

   b. 98 × 9 = **882**

   c. 37 × 7 = **259**

   d. 28 × 8 = **224**

4. Calculate the following divisions:

   a. 275 ÷ 5 = **55**

   b. 92 ÷ 4 = **23**

   c. 525 ÷ 25 = **21**

   d. 624 ÷ 12 = **52**

5. Find each missing number:

   a. **6** × 5 = 30

   b. **6** × 50 = 300

   c. **60** × 50 = 3000

   d. **6** × 5000 = 30 000

   e. 6 × **50 000** = 300 000

6. Find each missing number:

   a. 28 ÷ 7 = **4**

   b. 280 ÷ **7** = 40

   c. 280 ÷ **70** = 4

   d. **2800** ÷ 7 = 400

   e. **28 000** ÷ 7 = 4000

   f. 28 000 000 ÷ 7 = **4 000 000**

7. Use the following information to fill in the missing numbers below:
   3.5 × 2.1 = 7.35

   a. 35 × **2.1** = 73.5
   b. 35 × **21** = 735
   c. **3500** × 21 = 73 500
   d. 350 × **210** = 73 500
   e. 0.35 × **2 100 000** = 735 000

8. Use the following information to fill in the missing numbers below:
   5.8 × 6.3 = 36.54

   a. 58 × 6.3 = **365.4**
   b. 5.8 × 630 = **3654**
   c. 580 × 63 = **36 540**
   d. 5800 × 630 = **3 654 000**
   e. 0.58 × 63 = **36.54**

9. Estimate the answer to:

   a. 168 + 2573 = **200 + 2600 = 2800, or similar**
   b. 52 × 19 = **50 × 20 = 1000, or similar**
   c. 984 ÷ 22 = **1000 ÷ 20 = 50, or similar**

10. Amy has calculated 655 ÷ 21 = 3.12. Without calculating the exact answer, show that Amy must be wrong.

    655 is roughly 660

    21 is roughly 20

    660 ÷ 20 = 33

    Amy's answer is much too small.

11. A trolley has a weight limit of 100kg. You have 3 boxes, each weighing 35kg. In total, are these above or below the weight limit?

    3 × 35 = 105kg

    The boxes are above the weight limit.

12. On your journey to work, you walk for 16 minutes, spend 35 minutes on the train and then take a 13-minute bus journey. You spend a total of 10 minutes waiting at stops. How long does your journey to work take?

    16 + 35 + 13 + 10 = 74 minutes, or 1 hour 14 minutes.

Challenge

In a shop, a pencil costs 29p, a ruler costs 33p and a set of pens costs £1.19. You buy five pencils, a ruler and a set of pens and pay with a £5 note. How much change should you receive, in pounds?

5 × 29 = 145p

£1.19 × 100 = 119p

145 + 33 + 119 = 297p

297 ÷ 100 = £2.97

5 – 2.97 = £2.03 change

Problem solving/Games:

Place Value Mystery Number

Use these clues to help you calculate the missing number.

<table>
<tr>
<td>The mystery number (x) has been ordered with these numbers.
<table>
<tr><td>9 723 654</td><td>9 852 000</td><td>x</td><td>10 000 000</td></tr>
<tr><td colspan="2">Smallest</td><td colspan="2">Greatest</td></tr>
</table>
</td>
<td>If you count back from the mystery number in millions, you will arrive at an odd number less than 1 000 000 but greater than 999 900.</td>
</tr>
<tr>
<td>The value of the tens digit in the mystery number is 0.</td>
<td>The digit sum of the mystery number is 54.</td>
</tr>
</table>

The mystery number is _____.

Think of your own mystery number. Write clues which lead to calculating your mystery number.

Calculation Course

Viren and Mae leave their homes and walk to their new secondary school. They start by thinking of a number and at each step, they perform a calculation on it. What number will they have when they reach their new school?

Mae's number is 2^3.	
Multiply by the third prime number.	
Subtract the largest factor of 22, then divide by 6.	
Square this number then find the fifth multiple of the result.	

Viren's number is the only even prime number.	
Multiply by 12.	
Add 1, then square root.	
Add 3, then find the 3rd multiple.	
Subtract the 6th prime number.	
Add 1, then divide by 4.	
Cube, then subtract 12.	

Divide Mae's number by Viren's number.	

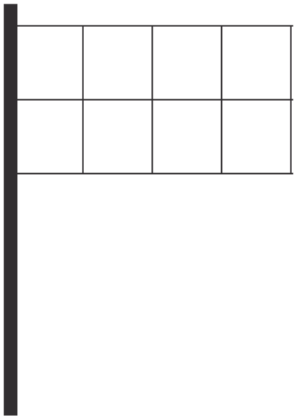
Fraction Flags

Colour each flag, using the given fractions. State the remainder as a fraction in its simplest form.

$\frac{3}{8} + \frac{1}{4}$ = green

$\frac{7}{8} - \frac{12}{16}$ = yellow

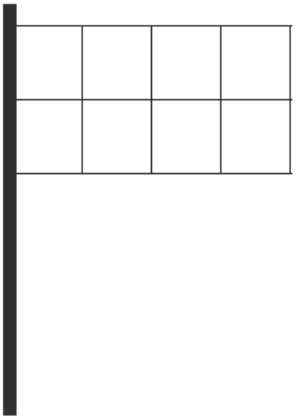
The rest will be blue.



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

$1\frac{1}{2} - 1\frac{3}{8}$ = yellow

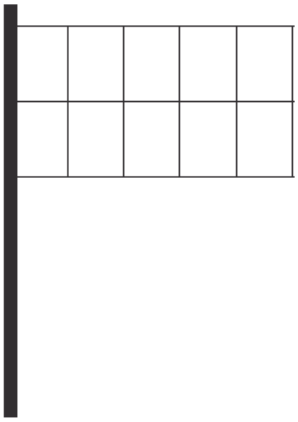
The rest will be white.



$\frac{1}{2} \times \frac{3}{5}$ = red

$\frac{8}{10} \times \frac{1}{2}$ = yellow

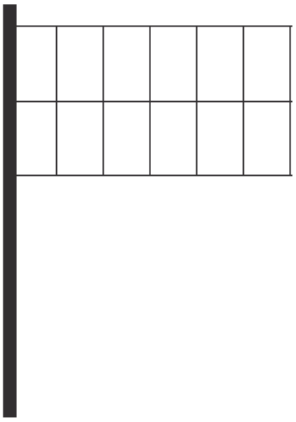
The rest will be blue.



$\frac{2}{3} \div 2$ = green

$\frac{3}{4} \div 3$ = red

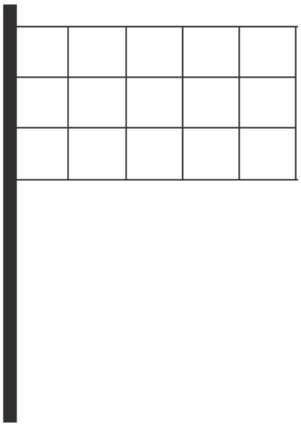
The rest will be yellow.



$\frac{4}{5} \div 6$ = blue

$\frac{7}{10} \times \frac{2}{3}$ = yellow

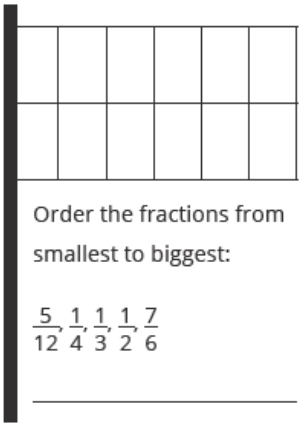
The rest will be green.



1st fraction in order = yellow

3rd fraction in order = green

The rest will be red.



Order the fractions from smallest to biggest:

$\frac{5}{12}, \frac{1}{4}, \frac{1}{3}, \frac{1}{2}, \frac{7}{6}$

Decimal Game

A game for two players (or more players can work in teams).

Each player will need:

0 - 9 digit cards.

Instructions:

Shuffle your set of cards and place them face down.

Player one turns over two cards.

The first card represents the value in the unit (or ones) column. The second card represents the value in the tenths column.

For example, player one turns over 9 and 5. These represent 9 and 0.5

Multiply the two numbers together.

For example $9 \times 0.5 = 4.5$

The answer is that players score.

Player two then takes their turn.

Add up the scores as you go.

The first player to reach 100 or more is the winner.

Want to try something more challenging?

Make the second card to represent a hundredth.

For example a 9 and a 5 represents $9 \times 0.05 = 0.45$

The first player to reach 10 or more is the winner.

Geometry and Measure Game

A game for two players (or more players can work in teams).

You will need:

A pair of dice

Two piles of different coloured counters (at least 20 of each).

Instructions:

Each player choose a colour.

Player one will roll two dice and add the numbers. Find a corresponding square (some numbers will have more than one possible square to choose from).

Answer the question. You only have one attempt.

Player two will then check player one's answer.

If the answer is correct, player one can 'claim' that square.

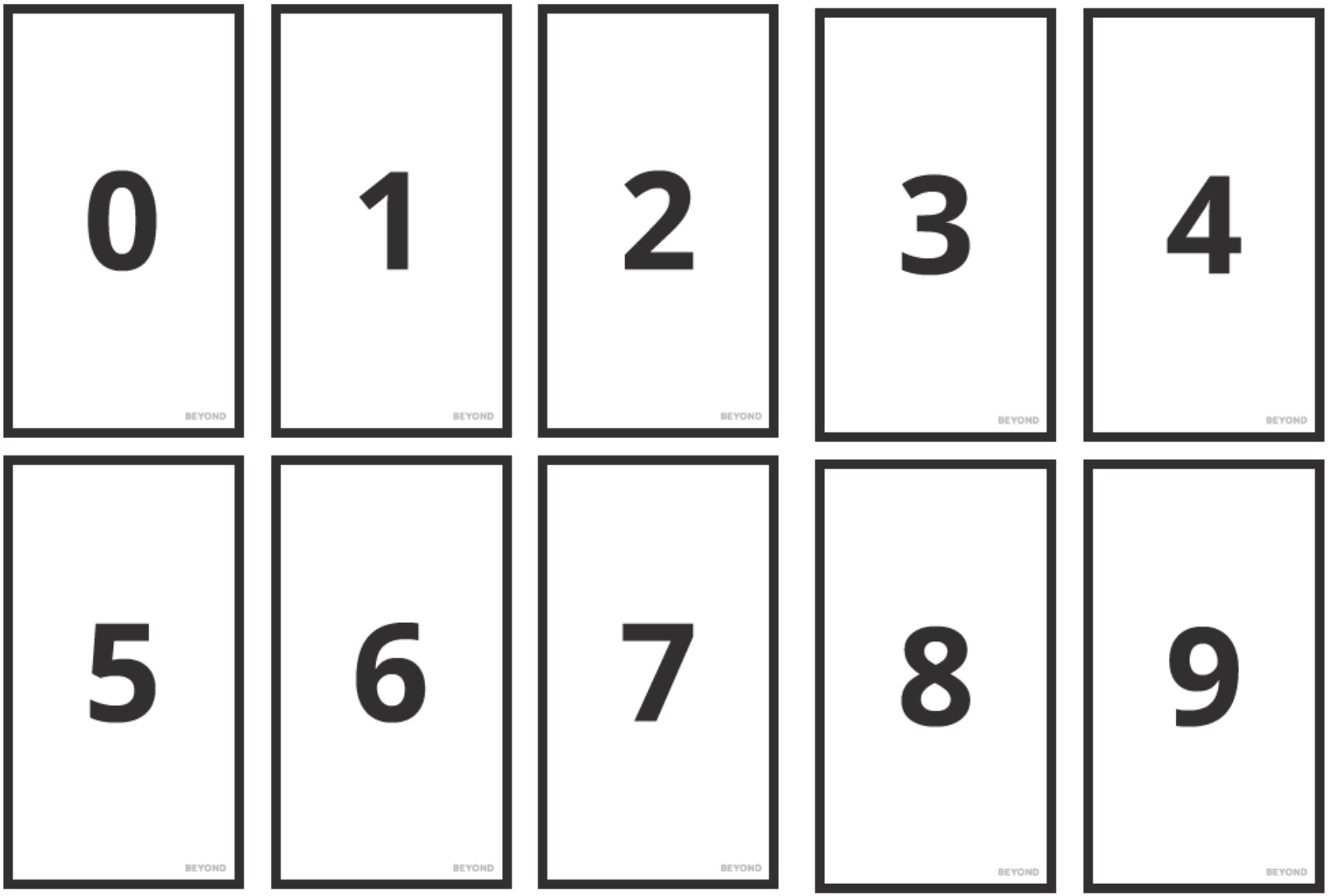
Player two then has their turn.

The winner is the first person to claim four squares in a row, horizontally, diagonally or vertically.

	1	2	3	4	5	6
	7	8	9	10	11	12
	13	14	15	16	17	18
	19	20	21	22	23	24
	25	26	27	28	29	30
	31	32	33	34	35	36
						

Geometry and Measure Game

Question Number	Question	Answer
1	The area of a square with length 5cm.	
2	The approximate number of kilometres in 5 miles.	
3	The number of millimetres in 5 centimetres.	
4	The name of an angle less than 90°.	
5	The number of millilitres in 3 litres.	
6	The volume of a cube with length 5m.	
7	The perimeter of a square with an area of $4cm^2$.	
8	Two angles are on a straight line. One is 50°. What is the other one?	
9	The area of a triangle with a base of 6cm and a height of 8cm.	
10	The name of a ten-sided polygon.	
11	The approximate number of kilometres in 15 miles.	
12	The value of an angle in an equilateral triangle.	
13	A circle has a radius 6cm long. Calculate the length of its diameter.	
14	The name of an angle greater than 90° but less than 180°.	
15	The number of centimetres in 2 metres.	
16	The number of kilograms in 2750 grams	
17	The number of millilitres in 5.4 litres.	
18	The number of centimetres in 65 millimetres.	
19	The name of a six-sided polygon.	
20	The approximate number of miles in 16 kilometres.	
21	The name of the line passing through the centre a circle from side to side.	
22	The name of a five-sided polygon.	
23	The number of seconds in 1 hour	
24	The area of a parallelogram with a base of 10cm and a vertical height of 5cm.	
25	The name of the edge of a circle.	
26	The number of grams in 4 kilograms	
27	The number of seconds in 5 minutes.	
28	The name of an angle equal to 90°.	
29	The number of hours in 300 minutes.	
30	The number of litres in 2500 millilitres.	
31	The number of metres in 3.25 kilometres.	
32	Two angles are on a straight line. One is 135°. What is the other one?	
33	The number of sides in a hexagon.	
34	The name of an angle greater than 180° but less than 360°.	
35	The name for any four-sided polygon.	
36	The name of the line from the centre of a circle to its edge.	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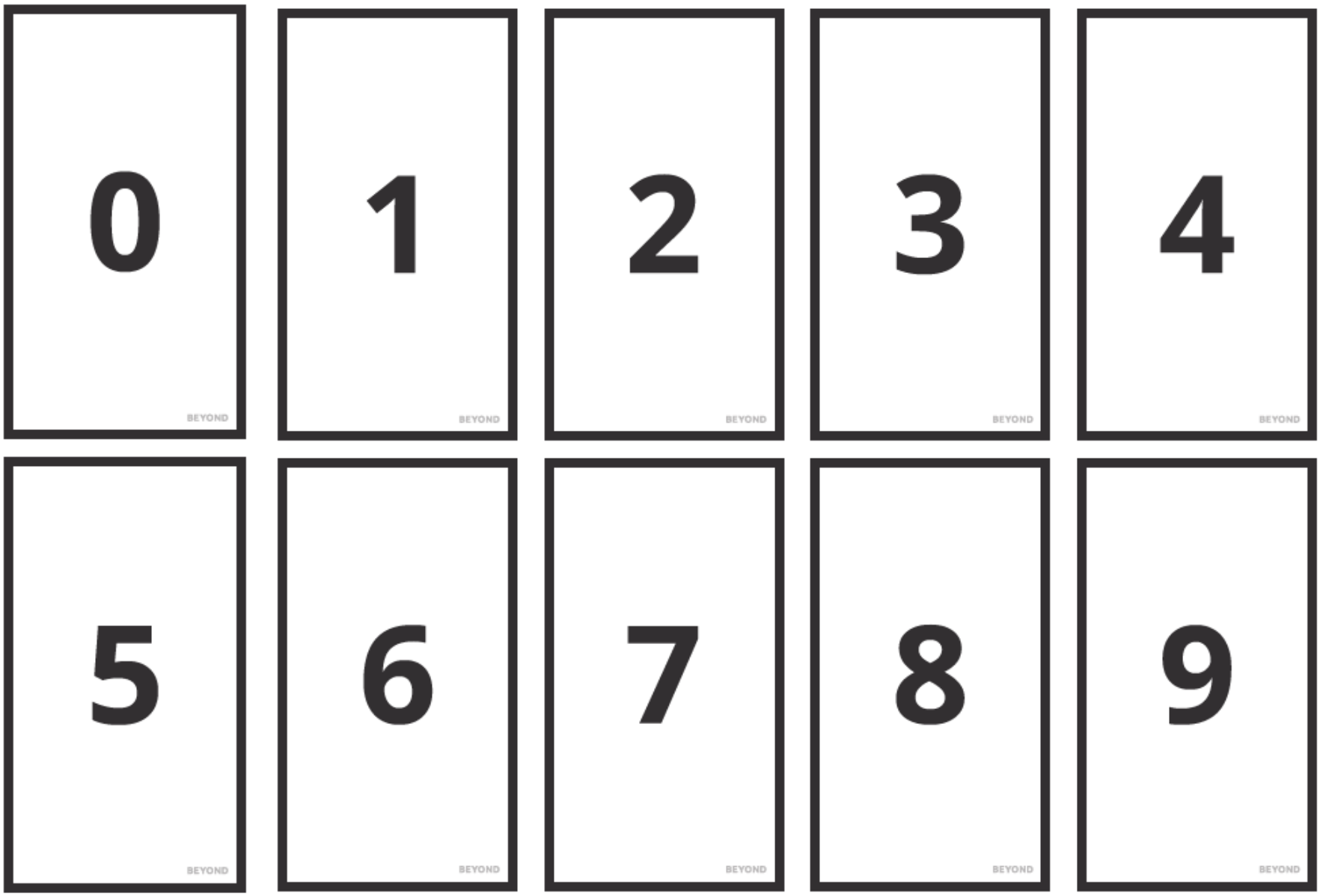
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ANSWERS:

Place Value Mystery Number **Answers**

Use these clues to help you calculate the missing number.

<table>
<tr>
<td>The mystery number (x) has been ordered with these numbers.
<table>
<tr><td>9 723 654</td><td>9 852 000</td><td>x</td><td>10 000 000</td></tr>
<tr><td colspan="2">Smallest</td><td colspan="2">Greatest</td></tr>
</table>
</td>
<td>If you count back from the mystery number in millions, you will arrive at an odd number less than 1 000 000 but greater than 999 900.</td>
</tr>
<tr>
<td>The value of the tens digit in the mystery number is 0.</td>
<td>The digit sum of the mystery number is 54.</td>
</tr>
</table>

The mystery number is **9 999 909**.

Think of your own mystery number. Write clues which lead to calculating your mystery number.

Calculation Course **Answers**

Viren and Mae leave their homes and walk to their new secondary school. They start by thinking of a number and at each step, they perform a calculation on it. What number will they have when they reach their new school?

Mae's number is 2^3.	**8**
Multiply by the third prime number.	**8 × 5 = 40**
Subtract the largest factor of 22, then divide by 6.	**40 – 22 = 18** **18 ÷ 6 = 3**
Square this number then find the fifth multiple of the result.	**3^2 = 9** **Fifth multiple of 9 = 45**

Viren's number is the only even prime number.	**2**
Multiply by 12.	**2 × 12 = 24**
Add 1, then square root.	**$\sqrt{25}$ = 5**
Add 3, then find the 3rd multiple.	**24**
Subtract the 6th prime number.	**24 – 13 = 11**
Add 1, then divide by 4.	**12 ÷ 4 = 3**
Cube, then subtract 12.	**3^3 = 27** **27 – 12 = 15**

Divide Mae's number by Viren's number.	**45 ÷ 15 = 3**

Fraction Flags **Answers**

Colour each flag, using the given fractions. State the remainder as a fraction in its simplest form.

$\frac{3}{8} + \frac{1}{4}$ = green

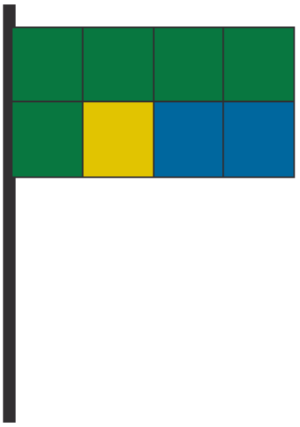
$\frac{7}{8} - \frac{12}{16}$ = yellow

The rest will be blue.

green = $\frac{5}{8}$

yellow = $\frac{1}{8}$

blue = $\frac{2}{8} = \frac{1}{4}$



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

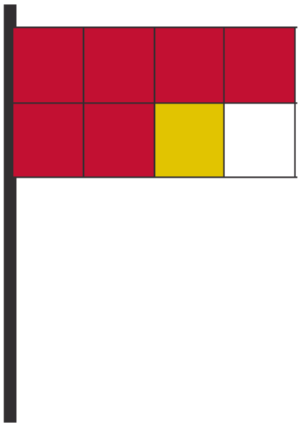
$1\frac{1}{2} - 1\frac{3}{8}$ = yellow

The rest will be white.

red = $\frac{3}{4}$

yellow = $\frac{1}{8}$

white = $\frac{1}{8}$



$\frac{1}{2} \times \frac{3}{5}$ = red

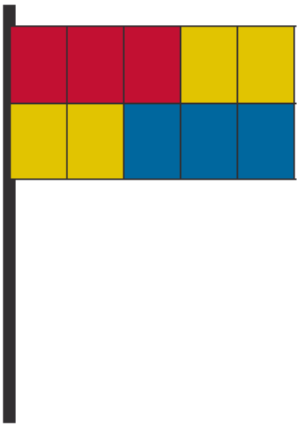
$\frac{8}{10} \times \frac{1}{2}$ = yellow

The rest will be blue.

red = $\frac{3}{10}$

yellow = $\frac{8}{20}$ or $\frac{4}{10}$ or $\frac{2}{5}$

blue = $\frac{3}{10}$



$\frac{2}{3} \div 2$ = green

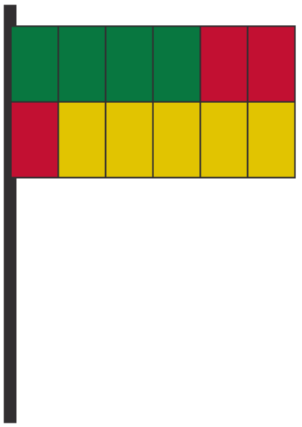
$\frac{3}{4} \div 3$ = red

The rest will be yellow.

green = $\frac{2}{6}$ or $\frac{1}{3}$ or $\frac{4}{12}$

red = $\frac{3}{12}$ or $\frac{1}{4}$

yellow = $\frac{5}{12}$



$\frac{4}{5} \div 6$ = blue

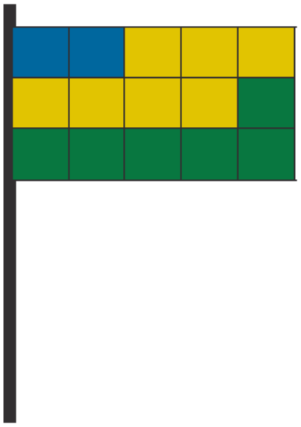
$\frac{7}{10} \times \frac{2}{3}$ = yellow

The rest will be green.

blue = $\frac{4}{30}$ or $\frac{2}{15}$

yellow = $\frac{14}{30}$ or $\frac{7}{15}$

green = $\frac{6}{15} = \frac{2}{5}$



1st fraction in order = yellow

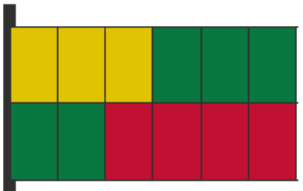
3rd fraction in order = green

The rest will be red.

yellow = $\frac{1}{4}$ or $\frac{3}{12}$

green = $\frac{5}{12}$

red = $\frac{4}{12}$ or $\frac{1}{3}$



Order the fractions from smallest to biggest:

$\frac{5}{12}, \frac{1}{4}, \frac{1}{3}, \frac{1}{2}, \frac{7}{6}$

$\frac{1}{4}, \frac{1}{3}, \frac{5}{12}, \frac{1}{2}, \frac{7}{6}$

Geometry and Measure Game **Answers**

Question Number	Question	Answer
1	The area of a square with length 5cm.	**25cm^2**
2	The approximate number of kilometres in 5 miles.	**8km**
3	The number of millimetres in 5 centimetres.	**50**
4	The name of an angle less than 90°.	**Acute**
5	The number of millilitres in 3 litres.	**3000ml**
6	The volume of a cube with length 5m.	**125m^3**
7	The perimeter of a square with an area of 4cm^2.	**8cm**
8	Two angles are on a straight line. One is 50°. What is the other one?	**130°**
9	The area of a triangle with a base of 6cm and a height of 8cm.	**24cm^2**
10	The name of a ten-sided polygon.	**Decagon**
11	The approximate number of kilometres in 15 miles.	**24km**
12	The value of an angle in an equilateral triangle.	**60°**
13	A circle has a radius 6cm long. Calculate the length of its diameter.	**12cm**
14	The name of an angle greater than 90° but less than 180°.	**Obtuse**
15	The number of centimetres in 2 metres.	**200cm**
16	The number of kilograms in 2750 grams	**2.75kg**
17	The number of millilitres in 5.4 litres.	**5400ml**
18	The number of centimetres in 65 millimetres.	**6.5cm**
19	The name of a six-sided polygon.	**Hexagon**
20	The approximate number of miles in 16 kilometres.	**10 miles**
21	The name of the line passing through the centre a circle from side to side.	**Diameter**
22	The name of a five-sided polygon.	**Pentagon**
23	The number of seconds in 1 hour	**3600**
24	The area of a parallelogram with a base of 10cm and a vertical height of 5cm.	**50cm^2**
25	The name of the edge of a circle.	**Circumference**
26	The number of grams in 4 kilograms	**4000g**
27	The number of seconds in 5 minutes.	**300**
28	The name of an angle equal to 90°.	**Right angle**
29	The number of hours in 300 minutes.	**5**
30	The number of litres in 2500 millilitres.	**2.5l**
31	The number of metres in 3.25 kilometres.	**3250m**
32	Two angles are on a straight line. One is 135°. What is the other one?	**45°**
33	The number of sides in a hexagon.	**Six**
34	The name of an angle greater than 180° but less than 360°.	**Reflex**
35	The name for any four-sided polygon.	**Quadrilateral**
36	The name of the line from the centre of a circle to its edge.	**Radius**