

# Maths Revision



# Number and Place Value

Use numbers from -20 to 10 000

# Counting

## Count forwards and backwards in 4, 6, 7, 8, 9, 25, 50, 100 and 1000

7, 14, 21, 28, 35, 42 ...

625, 600, 575, 550, 525 ...

## Find 10, 100 or 1000 more or less than a given number

## What is 100 less than 1902?

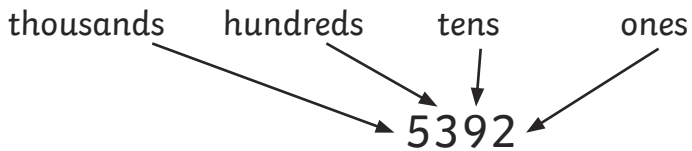
## What is 1000 more than 3249?

## Count backwards through zero

6, 5, 4, 3, 2, 1, 0, -1, -2, -3 ...

## Place Value

## Recognise the place value of each digit in up to four-digit numbers



# Compare and Order Numbers

Compare using  $<$ ,  $>$  or  $=$

$$2778 < 2881$$

**7662 > 7652**

## Smallest

1112

1121

1212

1222

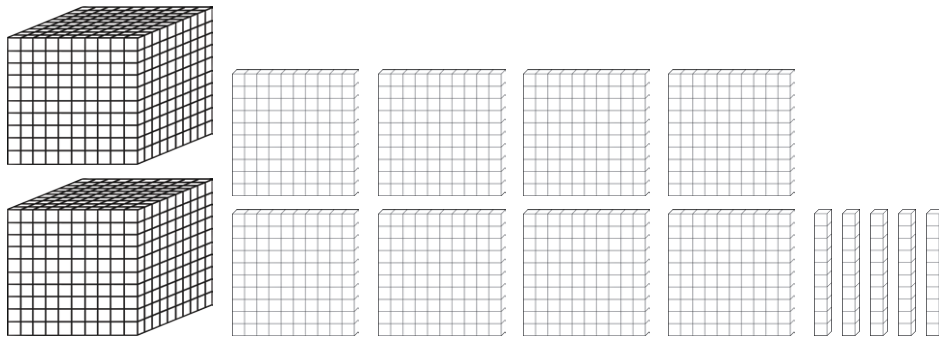
2121

## Greatest

## Identify, Represent and Estimate

Use models and representations of numbers

2850 can be represented by



## Rounding

Round numbers to the nearest 10, 100 or 1000

Remember 5 rounds up

45 rounded to the nearest 10 is 50

250 to the nearest 100 is 300

## Read and Write Numbers in Numerals and Words

4285 is four thousand, two hundred and eighty-five

## Roman Numerals

Use the following Roman numerals to represent numbers to 100:

Roman	Natural
I	1
V	5
X	10
L	50
C	100

XIX = 19

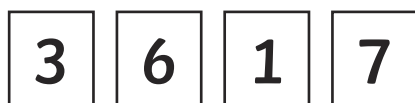
XXVI = 26

XLVIII = 48

LXXI = 71

## Solve Problems

Apply the knowledge and understanding from the above to solve problems



What is the largest number that can be made from these digits cards? **7631**

# Addition and Subtraction

## Add and Subtract Mentally

Add and subtract three-digit numbers and ones, tens and hundreds

$$376 + 3 = 379$$

$$376 + 40 = 416$$

$$376 + 200 = 576$$

## Formal Methods

2698 + 1562 becomes

$$\begin{array}{r} 2698 \\ + 1562 \\ \hline 4260 \\ \text{I I I} \end{array}$$

**Answer: 4260**

4935 - 2423 becomes

$$\begin{array}{r} 4935 \\ - 2423 \\ \hline 2512 \end{array}$$

**Answer: 2512**

6812 - 2364 becomes

$$\begin{array}{r} 6\cancel{8}^{10}\cancel{1}^02 \\ - 2364 \\ \hline 4448 \end{array}$$

**Answer: 4448**

## Estimate and Inverse

Estimate  $4318 + 1298 \approx 4300 + 1300 \approx 5600$

Inverse: check  $7932 - 3457 = 4475$ , by  $3457 + 4475 = 7932$

## Solve Problems

### Two-step problems

2891 people visit a cinema on one day. There are three films showing. 549 people see an adventure film, 1263 people see a musical and the rest see an animation. How many see the animation?

$$549 + 1263 = 1812 \text{ see the adventure and musical}$$

$$2891 - 1812 = 1079 \text{ see the animation}$$

# Multiplication and Division

## Multiplication Tables

Multiplication and division facts to  $12 \times 12$

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	65
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

<b>x</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>9</b>	<b>10</b>	<b>11</b>	<b>12</b>
<b>1</b>	1	2	3	4	5	6	7	8	9	10	11	12
<b>2</b>	2	4	6	8	10	12	14	16	18	20	22	24
<b>3</b>	3	6	9	12	15	18	21	24	27	30	33	36
<b>4</b>	4	8	12	16	20	24	28	32	36	40	44	48
<b>5</b>	5	10	15	20	25	30	35	40	45	50	55	60
<b>6</b>	6	12	18	24	30	36	42	48	54	60	66	72
<b>7</b>	7	14	21	28	35	42	49	56	63	70	77	84
<b>8</b>	8	16	24	32	40	48	56	64	72	80	88	96
<b>9</b>	9	18	27	36	45	54	63	72	81	90	99	108
<b>10</b>	10	20	30	40	50	60	70	80	90	100	110	120
<b>11</b>	11	22	33	44	55	66	77	88	99	110	121	132
<b>12</b>	12	24	36	48	60	72	84	96	108	120	132	144

## Multiplying and Dividing

Use place value and known facts:  $400 \times 5 = 2000$ ,  $630 \div 7 = 90$

Multiply by 0 and 1 and divide by 1:  $285 \times 1 = 285$ ,  $285 \times 0 = 0$ ,  $285 \div 1 = 285$

## Factor Pairs and Commutativity

The factor pairs of 56 are 1 and 56, 2 and 28, 4 and 14, 8 and 7.

Use this to solve: 56 pencils are shared between 4 tables. How many pencils does each table receive?

Commutativity means that changing the order of the numbers in a calculation does not change the answer:  $5 \times 9 \times 2 = 5 \times 2 \times 9 = 10 \times 9 = 90$

## Formal Methods

Use formal methods to multiply 2 and 3 digit numbers by 1 digit numbers

$27 \times 4$  becomes

$$\begin{array}{r} 27 \\ \times 4 \\ \hline 108 \\ 2 \end{array}$$

**Answer: 108**

$382 \times 7$  becomes

$$\begin{array}{r} 382 \\ \times 7 \\ \hline 2674 \\ 51 \end{array}$$

**Answer: 2394**

## Solve Problems

Missing number problems:  $\square \times 3 = 45$  or  $56 \div \square = 14$

## Scaling Problems

One pack of pencils contains 12 pencils. How many pencils are there in 8 packs?

$$12 \times 8 = 96$$

## Correspondence Problems

Jenna has 2 t-shirts and 4 pairs of shorts. How many different combinations of the t-shirts and shorts does Jenna have?

## Various answers

120 pencils are shared equally between 3 classes. How many pencils will they each receive?

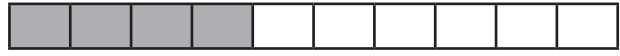
**Using the distributive law**  $39 \times 7 = 30 \times 7 + 9 \times 7 = 210 + 63 = 273$

# Fractions

## Tenths

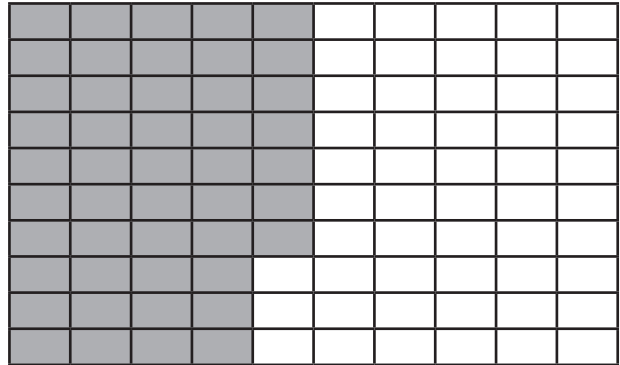
Counting:  $\frac{7}{10}$ ,  $\frac{6}{10}$ ,  $\frac{5}{10}$ ,  $\frac{4}{10}$ , ...

Dividing into 10 equal parts or by 10



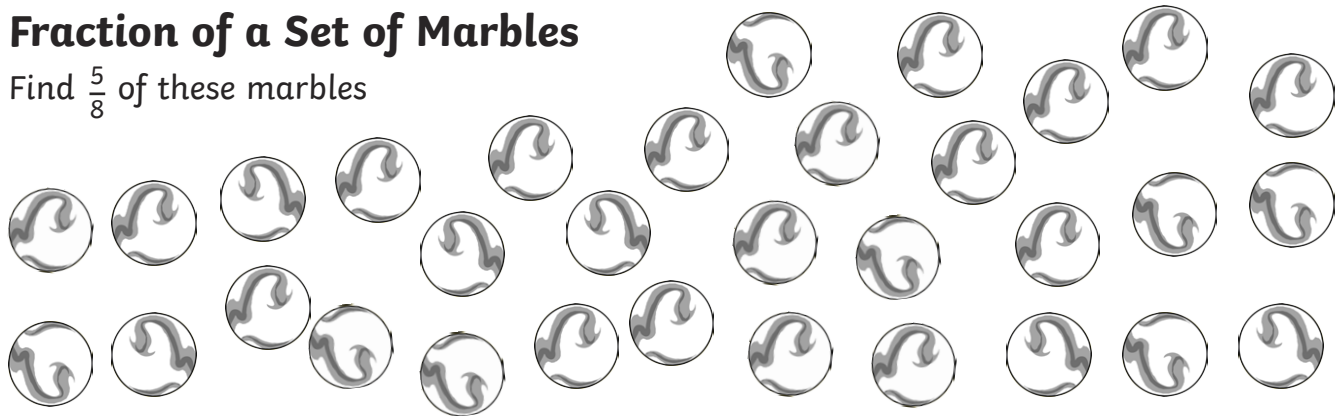
Counting:  $\frac{47}{100}$ ,  $\frac{46}{100}$ ,  $\frac{45}{100}$ ,  $\frac{44}{100}$ , ...

Dividing into 100 equal parts or by 100 or tenths by 10



## Fraction of a Set of Marbles

Find  $\frac{5}{8}$  of these marbles



$$32 \div 8 = 4$$

$$4 \times 5 = 20$$

## Equivalent Fractions



$$\frac{3}{4}$$

=



$$\frac{6}{8}$$

=



$$\frac{12}{16}$$



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

1															
$\frac{1}{3}$				$\frac{1}{3}$				$\frac{1}{3}$				$\frac{1}{3}$			
$\frac{1}{6}$		$\frac{1}{6}$		$\frac{1}{6}$		$\frac{1}{6}$		$\frac{1}{6}$		$\frac{1}{6}$		$\frac{1}{6}$		$\frac{1}{6}$	
$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$
$\frac{1}{24}$	$\frac{1}{24}$	$\frac{1}{24}$	$\frac{1}{24}$	$\frac{1}{24}$	$\frac{1}{24}$	$\frac{1}{24}$	$\frac{1}{24}$	$\frac{1}{24}$	$\frac{1}{24}$	$\frac{1}{24}$	$\frac{1}{24}$	$\frac{1}{24}$	$\frac{1}{24}$	$\frac{1}{24}$	$\frac{1}{24}$

1																			
$\frac{1}{5}$				$\frac{1}{5}$				$\frac{1}{5}$				$\frac{1}{5}$				$\frac{1}{5}$			
$\frac{1}{10}$		$\frac{1}{10}$		$\frac{1}{10}$		$\frac{1}{10}$		$\frac{1}{10}$		$\frac{1}{10}$		$\frac{1}{10}$		$\frac{1}{10}$		$\frac{1}{10}$		$\frac{1}{10}$	
$\frac{1}{20}$	$\frac{1}{20}$	$\frac{1}{20}$	$\frac{1}{20}$	$\frac{1}{20}$	$\frac{1}{20}$	$\frac{1}{20}$	$\frac{1}{20}$	$\frac{1}{20}$	$\frac{1}{20}$	$\frac{1}{20}$	$\frac{1}{20}$	$\frac{1}{20}$	$\frac{1}{20}$	$\frac{1}{20}$	$\frac{1}{20}$	$\frac{1}{20}$	$\frac{1}{20}$	$\frac{1}{20}$	$\frac{1}{20}$

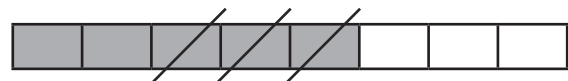
## Add and Subtract Fractions with the Same Denominator

Add or subtract the numerator, keeping the denominator the same. The answer can be expressed as an equivalent fraction.

$$\frac{1}{8} + \frac{3}{8} = \frac{4}{8} = \frac{1}{2}$$



$$\frac{5}{8} - \frac{3}{8} = \frac{2}{8} = \frac{1}{4}$$



## Compare and Order

Unit fractions

smallest

$\frac{1}{8}$

$\frac{1}{6}$

$\frac{1}{4}$

$\frac{1}{3}$

greatest

Fractions with the same denominator

$$\frac{1}{5} < \frac{3}{5}$$

## Decimal Equivalents

Tenths and hundredths:

$$\frac{7}{10} = 0.7$$

$$\frac{43}{100} = 0.43$$

$$\frac{1}{4} = 0.25$$

$$\frac{1}{2} = 0.5$$

$$\frac{3}{4} = 0.75$$

## Division by 10 and 100

$$2 \div 10 = 0.2$$

$$2 \div 100 = 0.02$$

$$25 \div 10 = 2.5$$

$$25 \div 100 = 0.25$$

## Rounding Decimals

To the nearest whole number:

0.5 rounds to 1 because the 5 rounds up

2.35 rounds to 2 because the 3 rounds down (ignoring the 5)

## Comparing Decimals

With the same number of decimal places

$$0.8 > 0.5$$

$$0.45 < 0.53$$

## Solve Problems

Adil divides his marbles into tenths. He wants to give two friends a number of the tenths of his marbles and keep the rest himself. Write 3 ways that he could share the marbles.

$$\text{Eg. } \frac{4}{10} + \frac{1}{10} + \frac{5}{10}$$

## Measure and Money Problems

Ellie buys a new shirt for £4.75 and a pair of trousers for £3.50 in a sale. She pays with a £10 note. What change will she receive?

A bag of potatoes weigh 2.45kg. How much will 4 bags cost that all weigh the same?

# Measurement

## Estimate, Measure, Compare, Add and Subtract

In all cases, be able to estimate with some accuracy prior to measuring

### Lengths (mm/cm/m)

Measure and draw lines using a ruler in centimetres (cm) or millimetres (mm).

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This line is 9.5cm or 95mm long.

### Mass (g/kg)

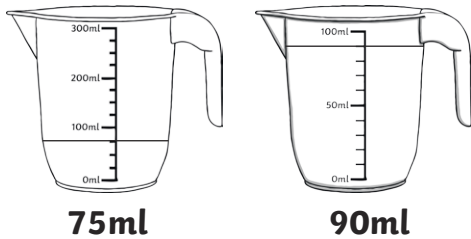
Measure the mass of objects using different scales

3 apples weigh 435g. One is eaten, and the 2 remaining apples weigh 285g. What is the mass of the eaten apple?

$$435\text{g} - 285\text{g} = 150\text{g}$$

### Capacity (ml/l)

Which jug has more water?



## Convert between units

Length: 1 km = 1000m, 1m = 100cm or 1000mm. 1cm = 10mm

Mass: 1kg = 1000g

Capacity/ Volume: 1l = 1000ml

Time: 1 year = 365 days (leap year 366 days), 1 week = 7 days,

30 days hath September,  
Ap ril, June and November.  
All the rest have 31,  
Excepting February alone  
Which only has but 28 days clear  
And 29 in each leap year.

1 day = 24 hours, 1 hour = 60 minutes, 1 minute = 60 seconds

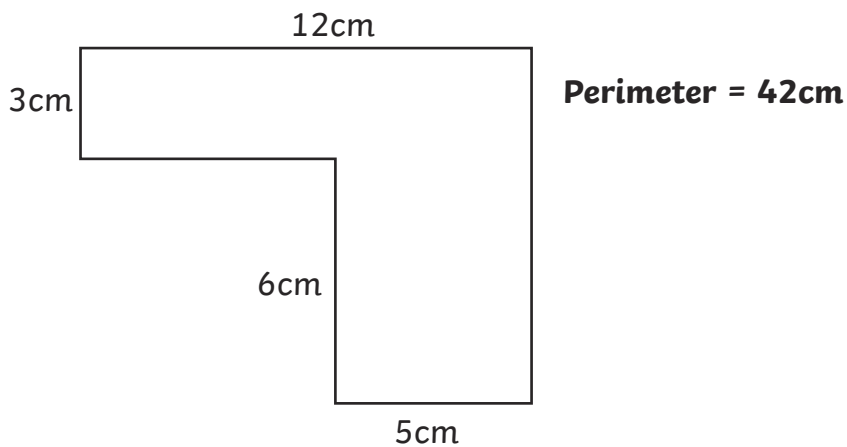
## Perimeter

The perimeter is the measurement around the edge of a shape



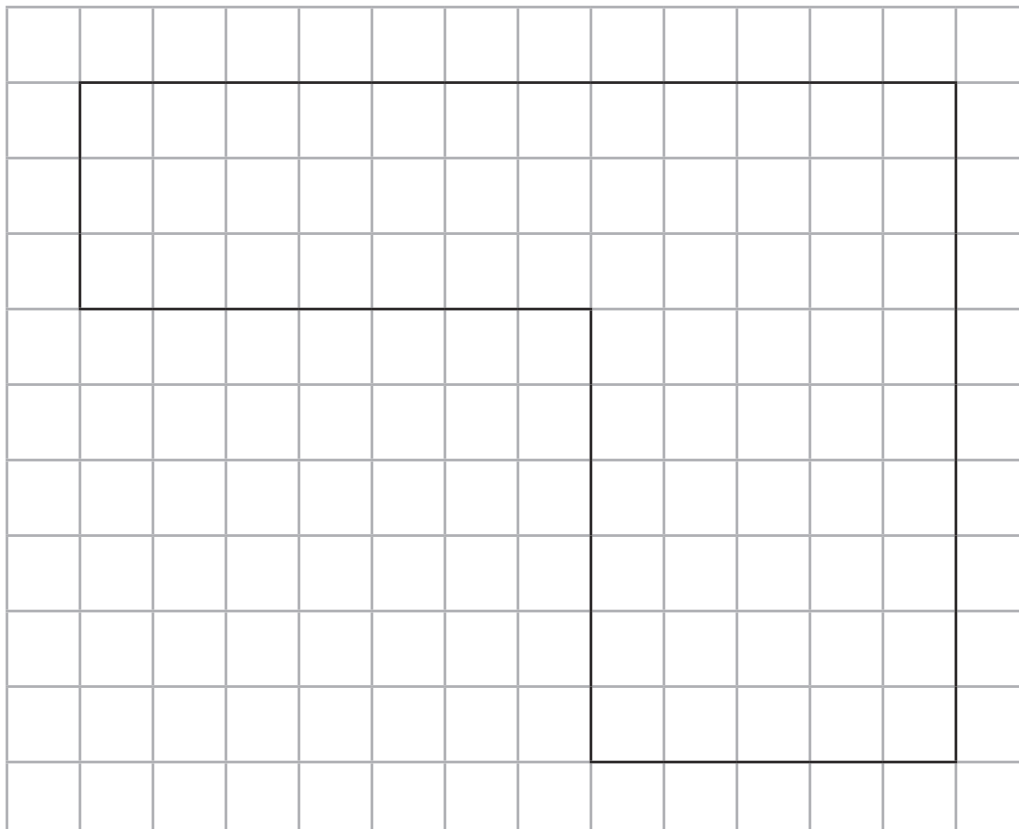
The sides of this rectangle are 8cm and 3cm, so the perimeter is 22cm.

Measure and calculate the perimeter of rectilinear shapes (including squares)



## Area

Area of rectilinear shapes by counting squares



Area = 66cm<sup>2</sup>

## Money

Add and subtract giving change

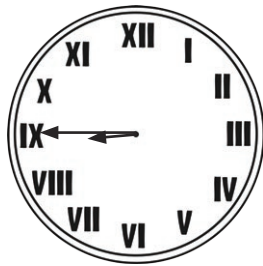
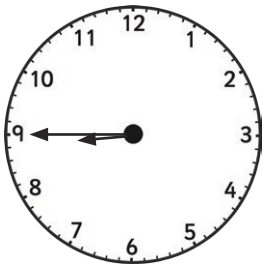
Jude buys an apple and an orange costing 25p and 15p. How much change from 50p?

Estimate how much money in a hand in £ and pence.

## Time

Analogue clocks and 12/24 hour time

These clocks show quarter to nine:



Record time in hours, minutes and seconds

The maths lesson lasted 1 hour and 5 minutes. The art lesson was one hour and twenty minutes. The art lesson was longer than the maths lesson.

**Morning is am, afternoon is pm**

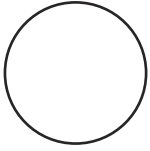
A film lasts 136 minutes. How long is the film in hours and minutes?

**2 hours and 16 minutes**

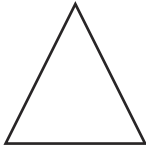
# Geometry – Shape

## 2D Shapes

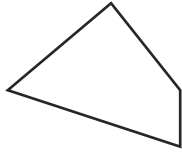
Main shapes: circle, triangle, quadrilateral, square, rectangle, rhombus, parallelogram, pentagon, hexagon, octagon, decagon



circle



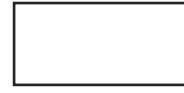
triangle



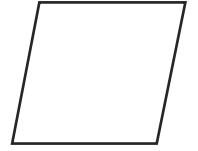
quadrilateral



square



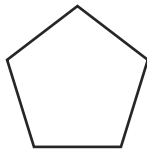
rectangle



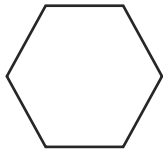
rhombus



parallelogram



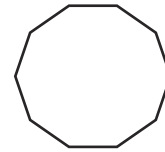
pentagon



hexagon

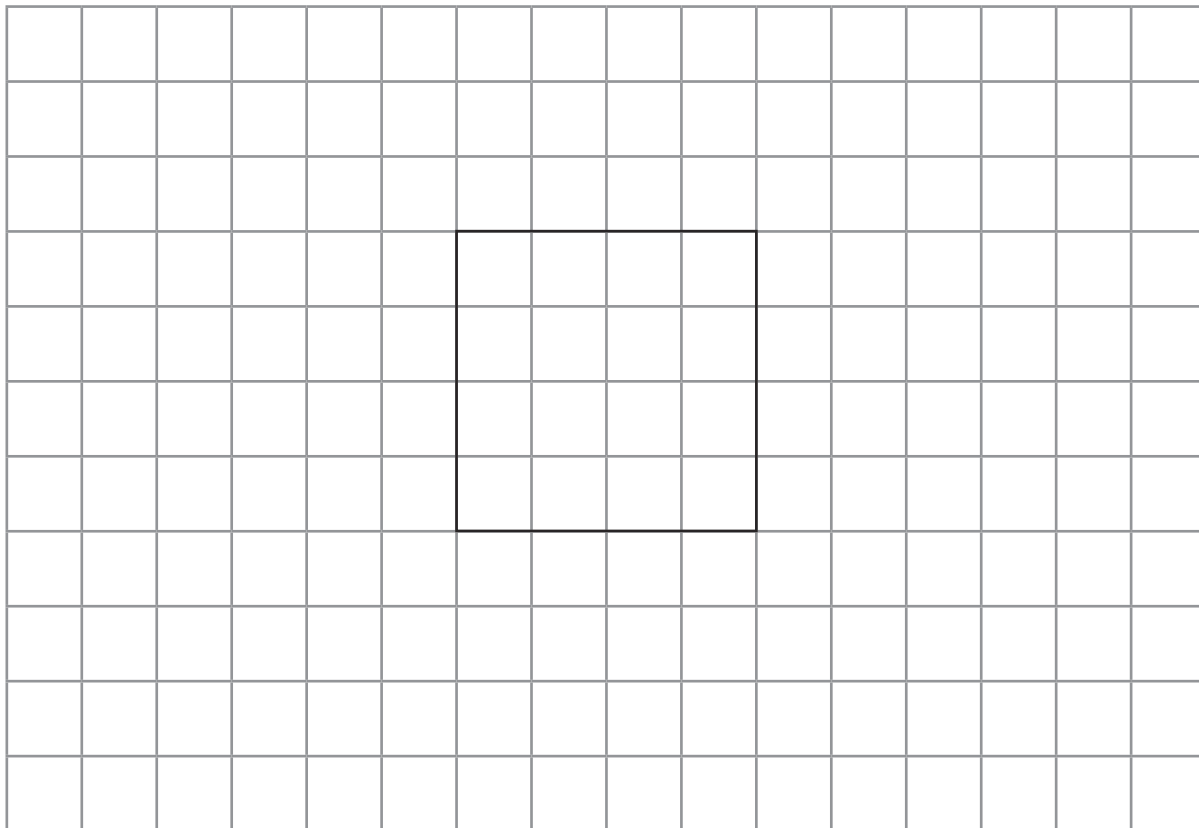


octagon

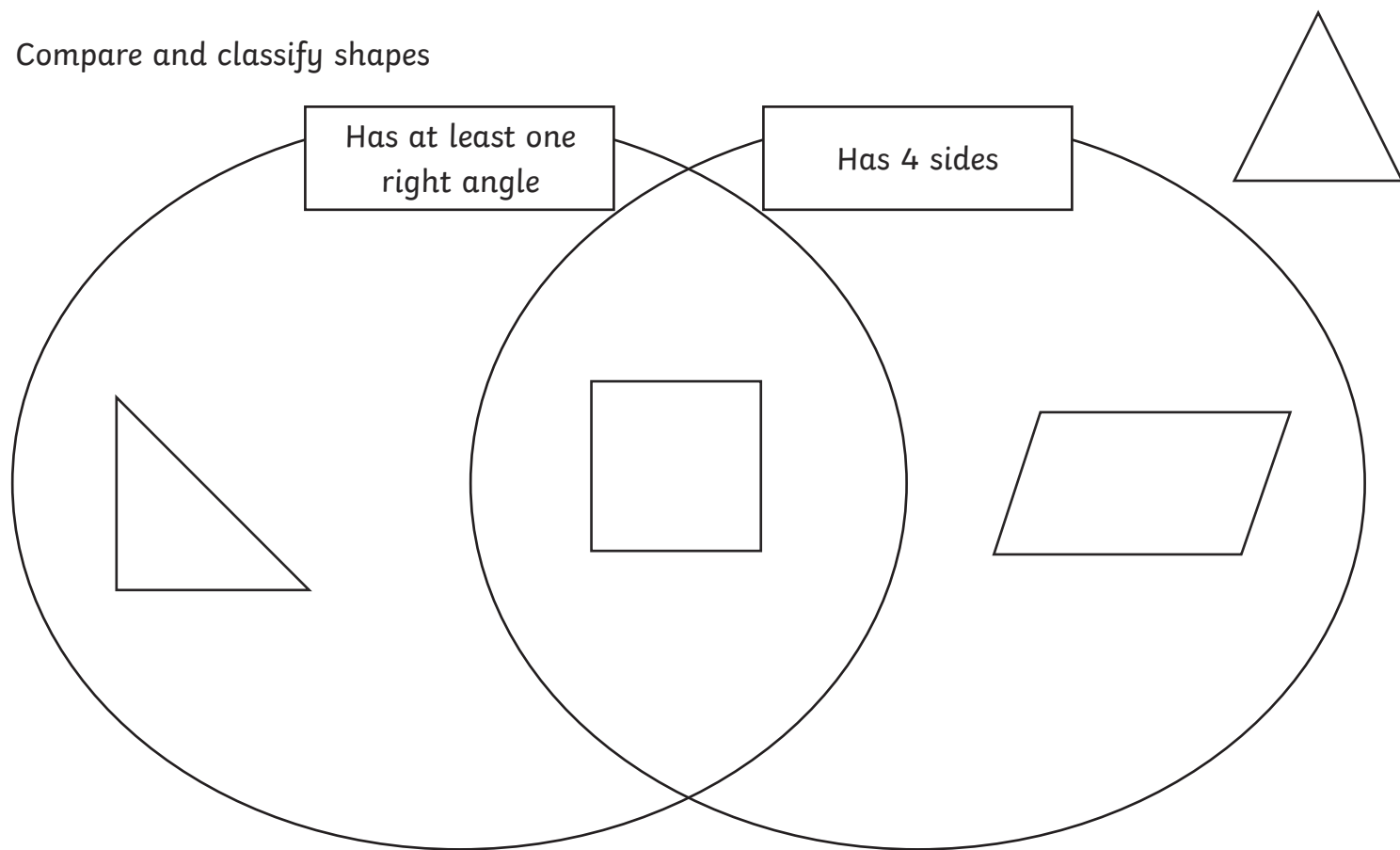


decagon

Draw a square on 1cm squared paper with sides of 4cm.



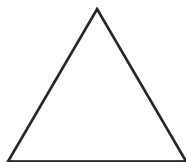
## Compare and classify shapes



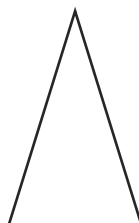
The 4 shapes are classified in this Venn diagram.

## Triangles

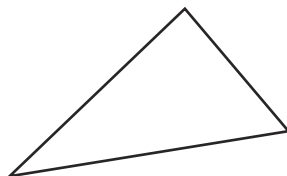
Equilateral (all sides and angles equal)



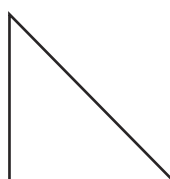
Isosceles (2 sides and angles equal)



Scalene (no sides and angles equal)

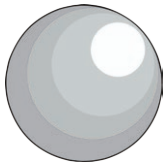


Right-angled triangle (one angle a right angle)



## 3D Shapes

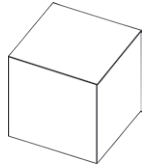
Main shapes: sphere, cylinder, cube, cuboid, tetrahedron, square-based pyramid, triangular prism, pentagonal prism, hexagonal prism



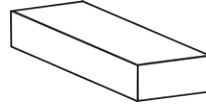
sphere



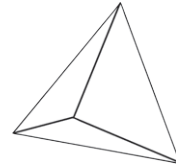
cylinder



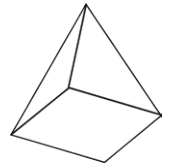
cube



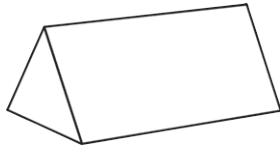
cuboid



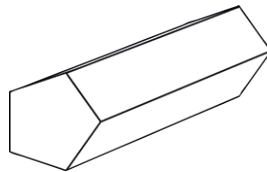
tetrahedron



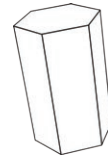
square-based  
pyramid



triangular prism



pentagonal prism

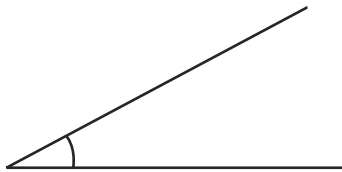


hexagonal prism

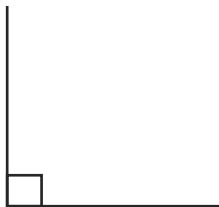
Recognise 2D representations and make models from modelling materials

## Angles

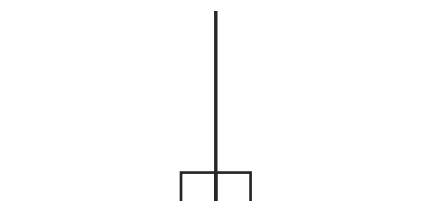
An angle measures a turn



A right angle is the corner of a square

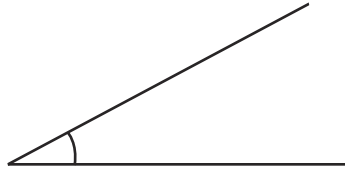


2 right angles make a straight line

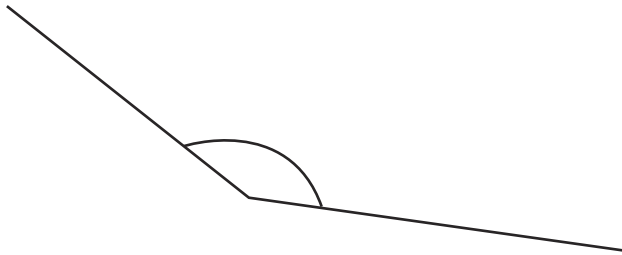




An acute angle is less than a right angle ( $90^\circ$ )



An obtuse angle is between a right angle and a straight line.

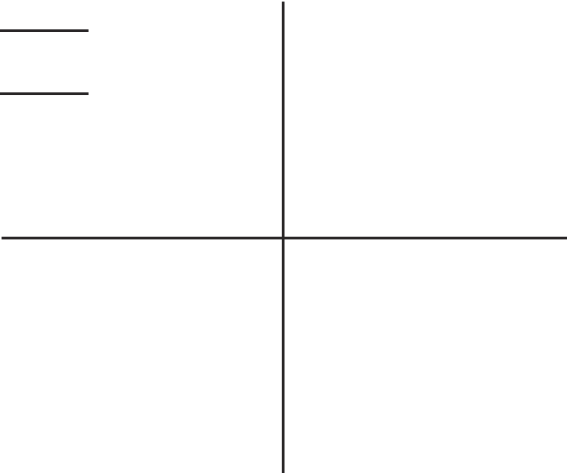


## Lines

Horizontal 

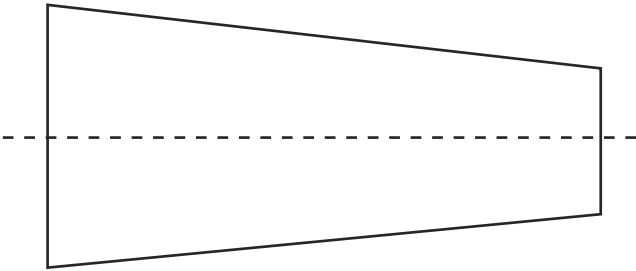
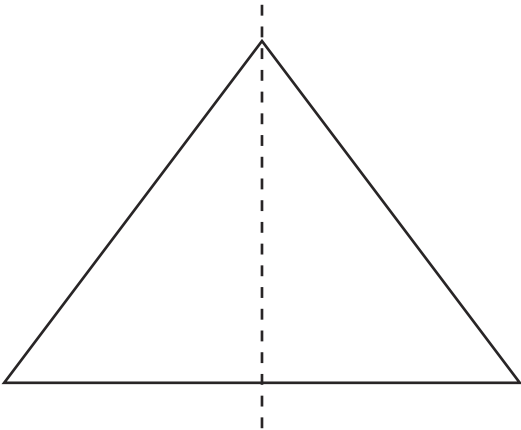
Vertical 

Parallel Lines 

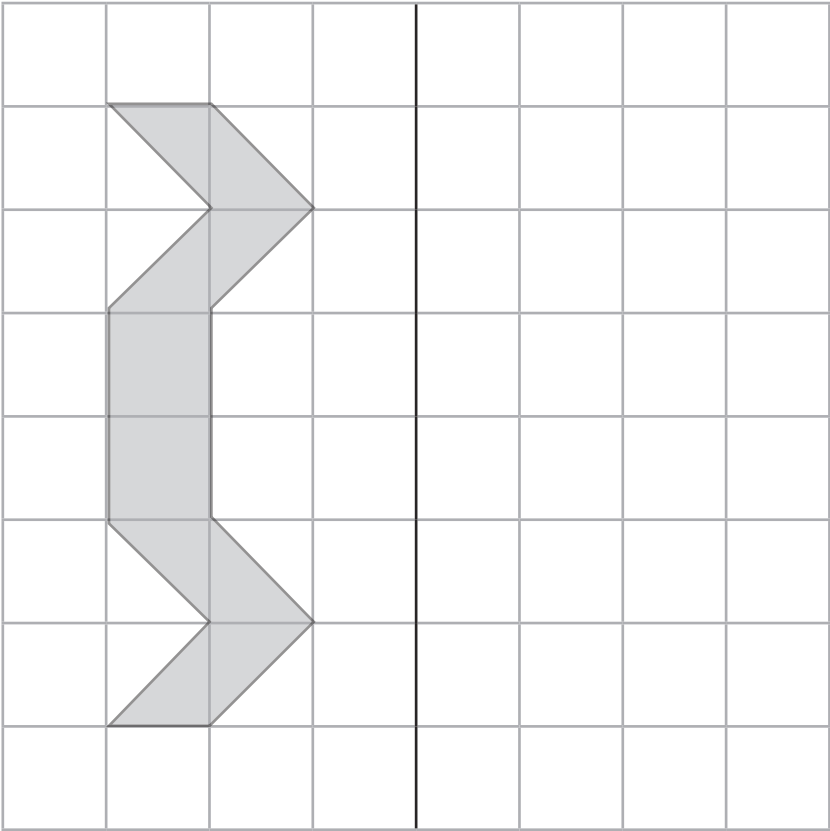
Perpendicular lines (at a right angle) 

# Symmetry

Identify lines of symmetry

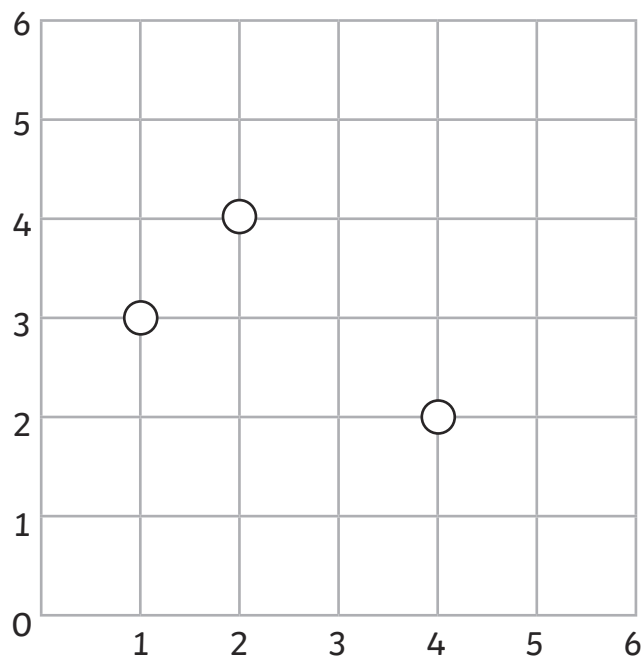


Complete a symmetrical figure



# Geometry – Position and Direction

## Coordinates



Label A, B and C

The coordinates are

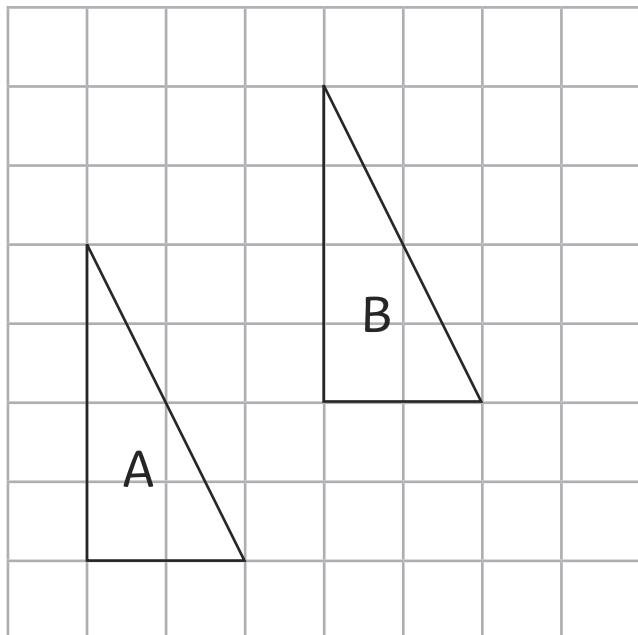
A (1,3)

B (2,4)

C (4,2)

What are the coordinates of the point that will complete a rectangle? **(3,1)**

## Translation

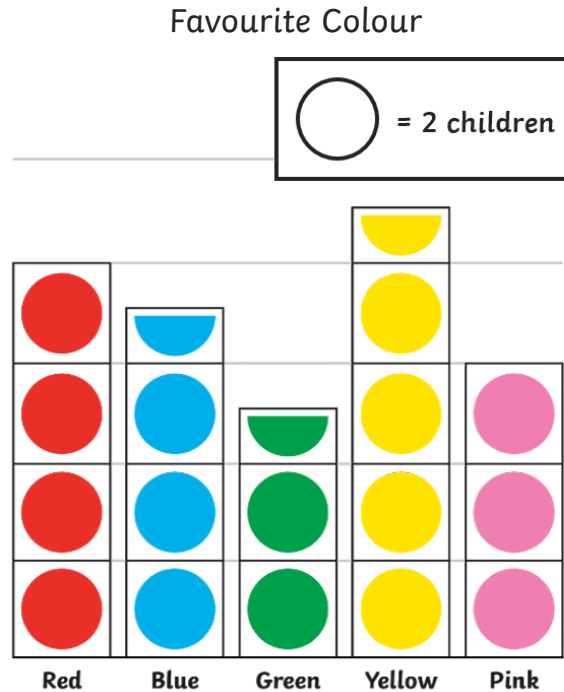


The triangle A is translated three squares to the right and two squares up to triangle B.

# Statistics

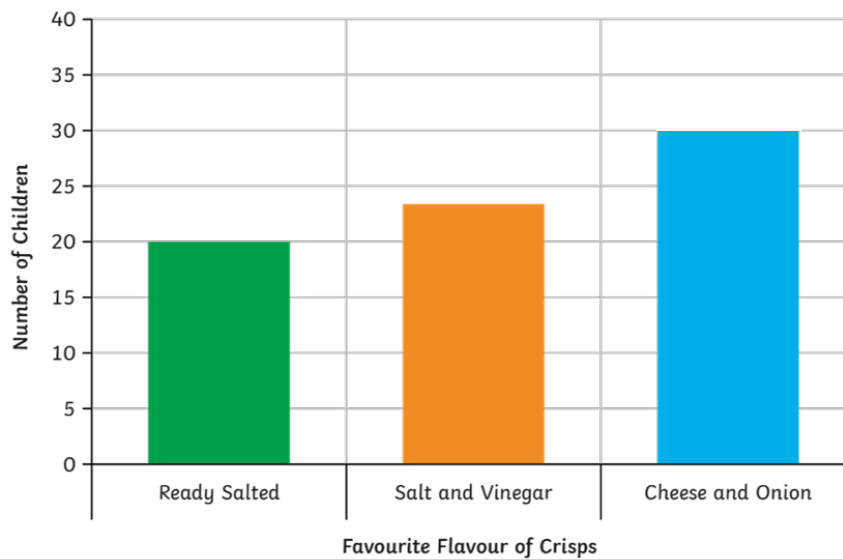
Present data in these graphs and tables and solve problems:

## Pictograms



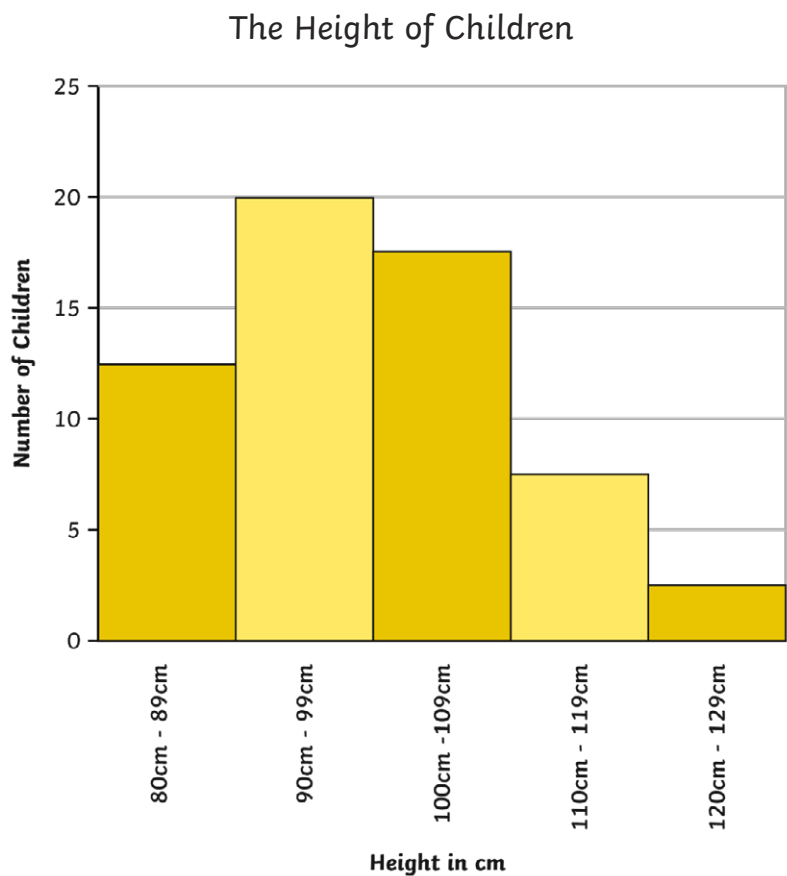
How many children chose their favourite colour? **35**

## Bar Charts



How many more children chose cheese and onion as their favourite crisps than ready salted?  
**10**

Continuous data can have any value – usually a measurement



How many children are shorter than 1m? (Add the first 2 bars)

**Tables**

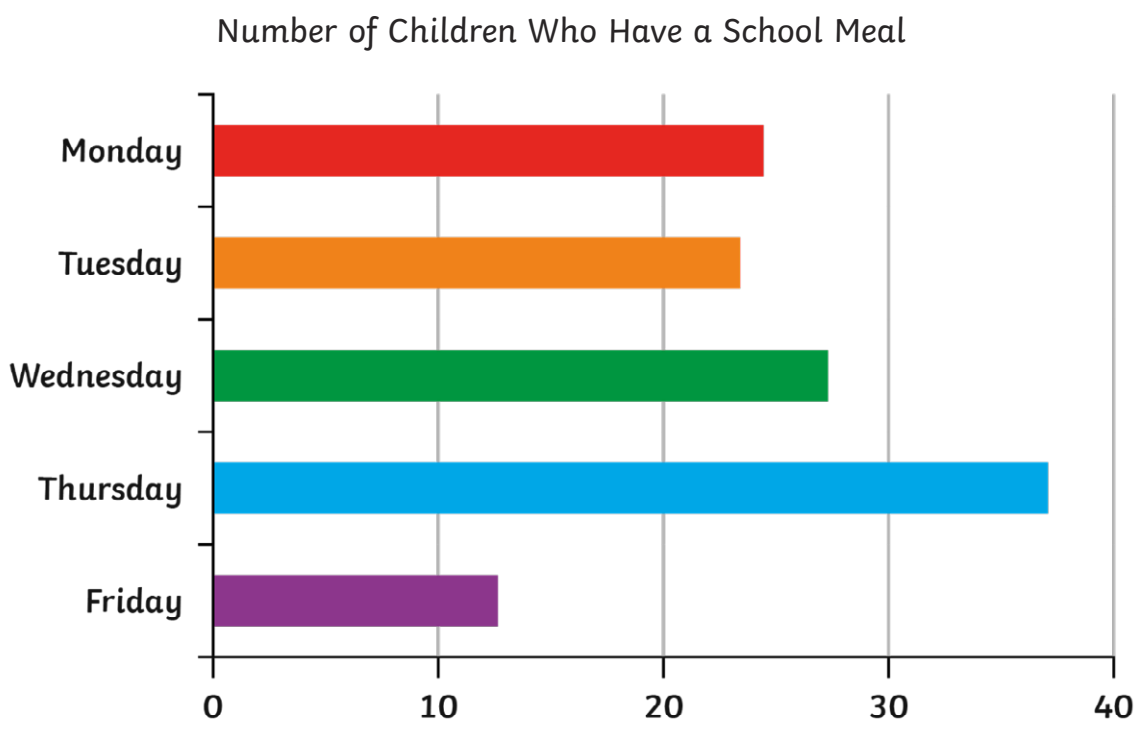
Here is a table of the chocolate bars sold to customers in a shop over 4 days.

	Monday	Tuesday	Wednesday	Thursday
Saturn	2	1	3	4
Twin	0	2	2	3
Stars	5	3	2	0
Cluster	2	2	2	2
Treasure	1	3	5	0
Tiger	6	3	4	1
Plimmy	1	3	2	2

Which chocolate bar is the most popular? **Tiger**

# Time Graphs

Time graphs show the changing of data over time. These often take the form of line graphs but can also be a bar chart.

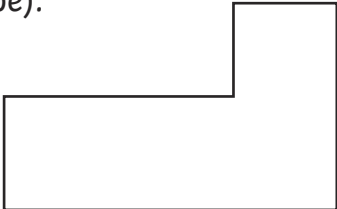


How many school meals were served during the week?

# Important Vocabulary

**This list is not exhaustive. Some vocabulary is described above.**

Vocabulary	Meaning
2D shapes	Flat shapes with no thickness. In theory a 2D shape cannot be picked up, but in practice shapes made of paper are counted as 2D. (A list of shapes is included in the section on shape.)
3D shapes	A shape with 3 dimensions that can be picked up. (A list of shapes is included in the section on shape.)
Analogue	A clock face with hands.
Area	The amount of space taken up by a shape.
Calculation	The working out of an answer using addition, subtraction, multiplication or division.
Capacity	How much a container holds.
Commutativity	The answer is the same no matter which way the calculation is completed: e.g. $2 + 4 = 4 + 2$ or $2 \times 4 = 4 \times 2$ .
Denominator	The bottom part of a fraction.
Digit	A single symbol used to make a numeral: 7 (All numbers are made from the ten digits 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 0.)
Digital	A clock using digits to tell the time.
Discrete	A whole number of a set of objects.
Equivalent fraction	A fraction which has the same value but is divided into a different number of parts: e.g. $\frac{1}{2} = \frac{2}{4}$
Factor	A factor of a number is a number into which the number can be divided with no remainders: e.g. the factors of 8 are 1, 2, 4, and 8.
Factor pairs	Factor pairs are 2 factors that are multiplied together to make the number: e.g. the factor pairs of 8 are 1 and 8, 2 and 4.
Fraction	A number express as the number of parts into which the whole has been divided: e.g. $\frac{3}{4}$ represents 3 parts out of 4.
Integer	A whole number with no parts: e.g. 5, 18, 109.
Inverse	An inverse operation is the opposite or reverse of an operation: e.g. the inverse of $6 - 4 = 2$ is $2 + 4 = 6$ or the inverse of $6 \div 3 = 2$ is $2 \times 3 = 6$ .
Mass	Often known as weight – how much matter is in an object.
Numeral	A symbol, symbols, word or words that stand for a number: 37 or thirty-seven.

Numerator	The top part of a fraction.
Perimeter	The measurement around an object.
Place value	The value of each digit in any number: In 27 the 2 represents 2 tens.
Polygon	A 2D shape with any number of sides.
Quadrant	A quarter of the space represented by coordinates, bordered by the x and y axes.
Quadrilateral	Any four sided shape.
Rectilinear	<p>A shape with all angles as right angles (the right angle can be inside or outside the shape).</p> 
Scale	The mathematical relationship between different measurements or number of objects.
The Distributive Law	Multiplying 2 numbers by a number and adding, gives the same answer as multiplying the sum of the 2 numbers by the other number: e.g. $4 \times (3 + 2) = 4 \times 3 + 4 \times 2$ .
Translation	The movement of a shape without rotation or reflection.
Volume	The amount of space taken up by an object.
Weight	Mass is measured by how much something weighs, but this can change in different locations.