



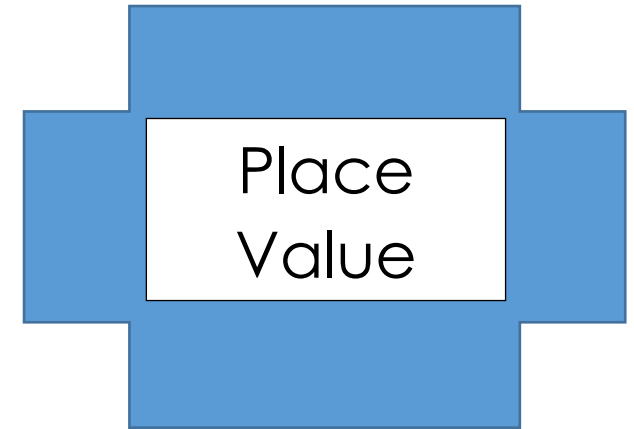
MASTERY IN MATHEMATICS

Year 3

YEAR 3 EXPECTATIONS

Year 3 Expectations

PV	<ul style="list-style-type: none"> Compare and order numbers to 1000 and read and write numbers to 1000 in numerals and words
PV	<ul style="list-style-type: none"> Count from 0 in multiples of 4, 8, 50 and 100
PV	<ul style="list-style-type: none"> Recognise the value of each digit in a 3-digit number
AS	<ul style="list-style-type: none"> Add and subtract mentally combinations of 1-digit and 2-digit numbers
AS	<ul style="list-style-type: none"> Add and subtract numbers with up to 3-digits using formal written methods
AS	<ul style="list-style-type: none"> Solve number problems using one and two step operation
MD	<ul style="list-style-type: none"> Derive and recall multiplication facts for 3, 4 and 8x multiplication tables
MD	<ul style="list-style-type: none"> Write and calculate mathematical statements for multiplication and division; including 2-digit number with a 1-digit number (from multiplication tables they know, ie, 2, 3, 4, 5, 8 and 10)
F	<ul style="list-style-type: none"> Understand and count in tenths, and find the fractional value of a given set
F	<ul style="list-style-type: none"> Add and subtract fractions with a common denominator
G	<ul style="list-style-type: none"> Identify right angles; compare other angles to being greater or smaller than a right angle
G	<ul style="list-style-type: none"> Identify horizontal and vertical lines and pairs of perpendicular and parallel lines
M	<ul style="list-style-type: none"> Tell time to nearest minute and use specific vocabulary: seconds, am and pm
M	<ul style="list-style-type: none"> Measure, compare, add and subtract using common metric measures
S	<ul style="list-style-type: none"> Solve one-step and two step problems using information presented in scaled bar charts, pictograms and tables



Year 3: Place Value

Place Value	Count from 0 in multiples of 4, 8, 50 and 100. Find 10 or 100 more or less than a given number.
	Recognise the place value of each digit in a three-digit number (hundreds, tens, ones).
	Compare and order numbers up to 1000. Read and write numbers up to 1000 in numerals and in words.
	Identify, represent and estimate numbers using different representations.
	Solve number problems and practical problems involving these ideas.

Creating 3-digit numbers

Make up a 3-digit number where the sum of the numbers is 9, e.g. 333 or 450.

What is the largest number you can make?

What is the second largest number you can make?

True or false

Circle either True or False against each number statement

25 is one half of 50 True or False

75 is a multiple of 5 True or False

75 is the same as 24 times 3 True or False

105 is half of 220 True or False

Creating 3-digit numbers

Make up a 3-digit number where the sum of the numbers is 5, e.g., 122 or 212.

What is the largest number you can make?

What is the second largest number you can make?

Spot the mistake

What is wrong with these sequences of numbers?

50, 100, 115, 200

75, 100, 125, 150, 165, 200

Thinking scientifically

In a science lesson children measure their height and weight. Here is a chart of their results.

Name	Weight (kg)	Height (cm)
Luke	52	98
Kaymer	58	102
Grace	47	89
George	71	110
Kane	65	105

Who is the heaviest person?

Who is the shortest person?

Luke grows 10cm. How tall is he now?

Chasing Shadows

At different times of the day pupils measured the length of their shadows. The table shows the outcomes:

Pupil Name	Length of shadow (cms)		
	8am	12 noon	6pm
Ahmed	205	145	215
Lucy	198	136	206
David	176	121	182
Tim	215	151	226

Say which person's shadow was the longest and when.

Work out who the tallest person is. _____

At what time of day are shadows longest? _____

What is the difference between the shadow of the tallest person at 6pm and the shortest person at 12 noon?

Creating 3-digit numbers

Look at the number cards below. Using the cards make up two 3-digit numbers that are more than 100 apart.



Look at the number cards below. Using the cards make up two 3-digit numbers that are less than 100 apart.



Look at the number cards below. Using the cards make up two 3-digit numbers that are more than 50 apart.



Look at the number cards below. Using the cards make up two 3-digit numbers that are less than 50 apart.



What's the answer?

6 children were given a maths problem where the answer was 198. Ariana put down 155 as her answer; George put down 183; Jemma put down 208; Hamid put down 217; Harry put down 164 and Mustafa put down 198. Who was closest to the answer and who was furthest away?

5 children were given a maths problem where the answer was 487. Harry put down 385 as his answer; James put down 473; Jen put down 618; Ahmed put down 592 and Harriet put down 464. Who was closest to the answer and who was furthest away?

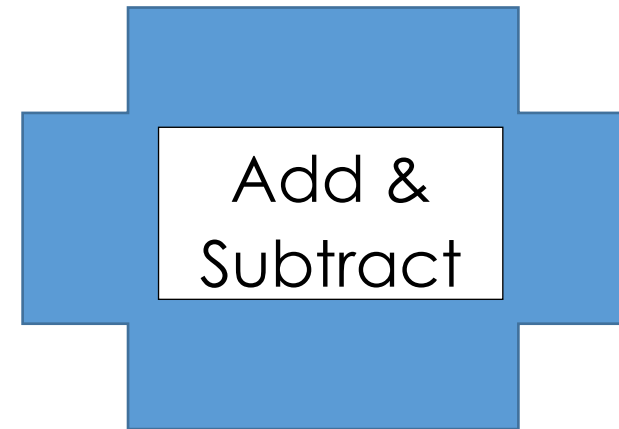
More 3-digit numbers

Create 3-digit numbers where the unit is one less than the tens and the tens is one less than the hundreds. What are the largest and smallest possible numbers you can create?

Largest

Smallest

Create two 3-digit numbers that have a difference of more than 10 with the ones number being 7 and the hundreds number being 6?



Year 3: Add & Subtract

Add and Subtract	Add and subtract numbers mentally, including: a 3-digit no and 1s, 10s, 100s.
	Add and subtract numbers with up to 3 digits, using formal written methods of columnar addition and subtraction.
	Estimate the answer to a calculation and use inverse operations to check answers.
	Solve problems, including missing no problems, using number facts, place value, and more complex addition/subtraction.

Making an estimate

Which of these number sentences have the answer that is between 50 and 60

174 - 119
333 - 276
932 - 871

Always, sometimes, never

Is it always, sometimes or never true that if you subtract a multiple of 10 from any number the units digit of that number stays the same? Circle your answer

always

sometimes

never

True or false

Are these number sentences true or false? Give your reasons.

$597 + 7 = 614$
 $804 - 70 = 744$
 $768 + 140 = 908$

Hard or easy?

Explain why you think the hard questions are hard?

$$323 + 10 =$$

$$393 + 10 =$$

$$454 - 100 =$$

$$954 - 120 =$$

Missing digits

$$\underline{\quad} + \underline{\quad} + \underline{\quad} = 201$$

Each missing digit is either a 9 or a 1. Write in the missing digits. Can you find different ways of doing this?

Making an estimate

Which of these number sentences have the answer that is between 50 and 60

$194 - 149$

$433 - 376$

$732 - 571$

Always, sometimes, never

Is it always, sometimes or never true that if you subtract a multiple of 10 from any number the units digit of that number stays the same?

always

sometimes

never

Is it always, sometimes or never true that when you add two numbers together you will get an even number?

always

sometimes

never

Toy shop

Here are the prices of items in a toy shop. You have £15 to spend. Write below which toys you can afford to buy whilst leaving yourself no more than £2 in change.

Model car £2	doll £4	Train set £5	puzzle £2	jigsaw £1
Magic set £6	Ball £2	Skipping rope £2	Cricket set £10	Goalposts £11

Which toys have you bought? (Don't forget they can't total more than £15.)

You have 3 friends to buy for and your parents say you cannot spend more than £20. Make a list of your purchases.

Friend A _____

Friend B _____

Friend C _____

The dice game

I have 8 dice (1 to 6). Show three ways I can lay out the dice so that numbers on top add up to 32.

I have 10 dice (1 to 6). Show three ways I can lay out the dice so that numbers on top add up to 43.

The two opposite sides of a dice always add up to 7. If the top numbers of 3 dice are 4, 2 and 5, how much will the bottom numbers add up to?

Cafe

At the café, next to school, you can buy the following:

Drink	Snack	Lunch
Tea 40p Coke 25p Coffee 40p Milk 20p Water 10p Orange Juice 15p	Crisps 35p Biscuits 20p Sweets 25p Apple 15p	Burger 75p Sausage Roll 45p Chips 35p Bacon Roll 55p

You have £1 to spend. Choose 1 item from each group to buy. List them below and then work out how much they cost you altogether. How much change you will have from £1?

Drink	Snack	Lunch

Total Cost

Change

Relay run

Four runners each ran 100m in a relay. The first runner took 16 seconds; the second 15 seconds; the third 18 seconds and the last runner took 14 seconds. How long did it take for the runners to complete the relay?

The four runners completed the relay in 78 seconds. The fastest runner ran her leg twice as fast as the slowest runner and the other two ran their leg in the same time. How fast did each runner run? Give one possible solution.

The 25 Dice trick

25 dice are placed together as below. All dice have numbers 1 to 6.

Set out the dice in any way you want in another 5 x 5 pattern so that the numbers facing upwards add up to 125.

Set out the dice in any way you want in another 5 x 5 pattern so that the numbers facing upwards add up to 105.

Set out the dice in any way you want in a 6 x 6 pattern so that the numbers facing upwards add up to 125.

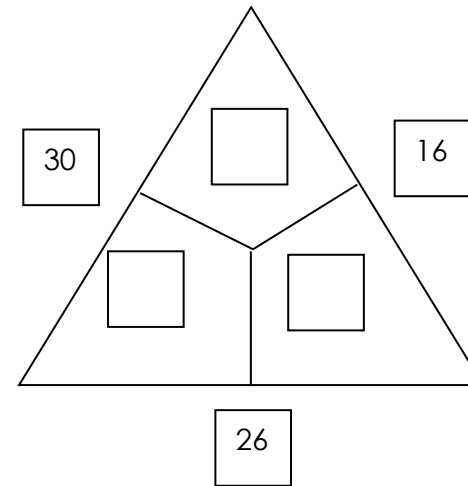
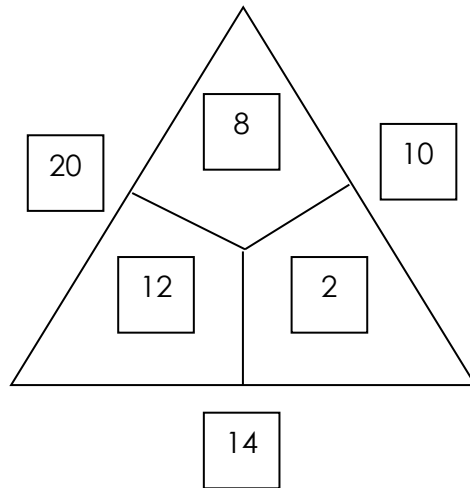
Set out the dice in any way you want in a 4 x 4 pattern so that the numbers facing upwards add up to 56.



4	4	4	3	3
4	4	3	3	3
4	3	3	3	3
3	3	3	3	3
3	3	3	3	4

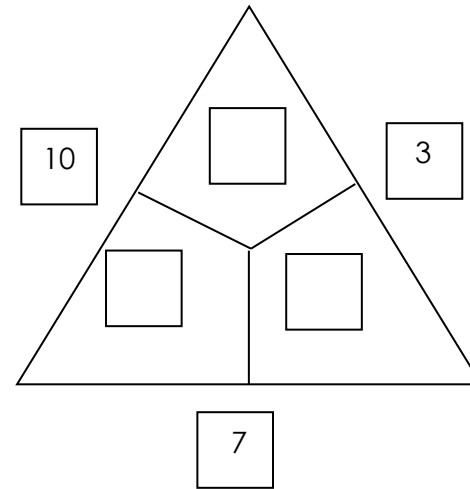
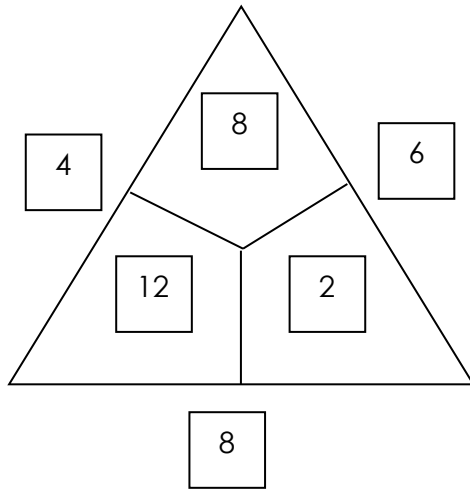
Triangle fun

Look at the example on the left hand side below. Complete the problem on the right hand side, putting the correct numbers in the empty squares.

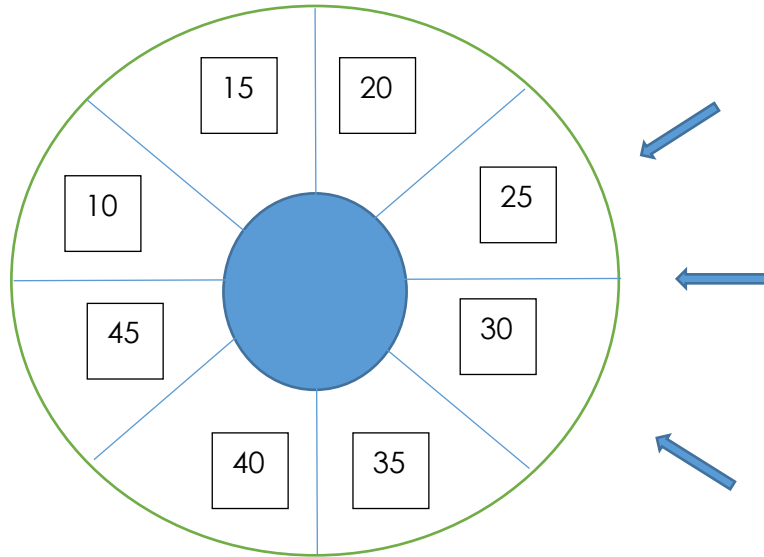


More triangle fun

Look at the example on the left hand side below. Complete the problem on the right hand side, putting the correct numbers in the empty squares.



Dart board problem



A special dart board has 8 numbers from 10 to 45 going up in 5s.

If the dart hits a segment in the blue area the number doubles so the highest possible number could be 90.

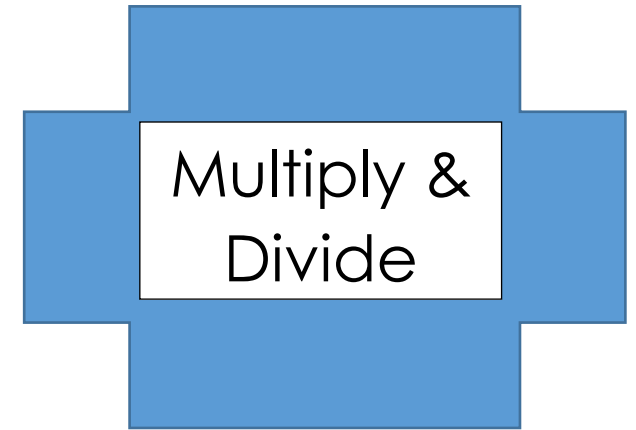
How many ways could the 3 darts be placed to score exactly 200? Write out all possible combinations.

How many ways can you score 150?

Set out your combinations.

How many ways could you score 100?

Set out your combinations



Year 3: Multiply & Divide

Multiply & Divide	Recall and use multiplication and division facts for the 3, 4 and 8 multiplication tables.
	Write and calculate math statements for \times and \div using the tables they know, including 2-digit numbers times 1-digit numbers, using mental and formal written methods.
	Solve problems and missing number problems, involving \times and \div , including integer scaling problems and correspondence problems in which n objects are connected to m objects.

How close can you get?

$$\square \times \square = \square$$

Using the digits 2, 3 and 4 in the calculation above. How close can you get to 100?

What is the largest product?

What is the smallest product?

$$\square \times \square = \square$$

Using the digits 5, 6 and 7 in the calculation above. How close can you get to 200?

What is the largest product?

What is the smallest product?

Use the inverse

Use the inverse to check if the following calculations are correct.

$$23 \times 4 = 82$$

$$117 \div 9 = 14$$

Size of an answer

Will the answer to the following calculations be greater or less than 80?

$$23 \times 3 =$$

$$32 \times 3 =$$

$$42 \times 3 =$$

$$36 \times 2 =$$

Checking cost

A class of 30 has planned a visit to a museum. If everyone pays the same to enter, how much money could be collected?

Put a tick or a cross against the possible answers.

£30

£25

£60

£75

£29

A family of 4 decided to go to see the latest film about a Stone Age boy. Tickets for the adults cost twice as much as the tickets for the children. How much might the family have spent altogether?

£15

£34

£60

£23

£29

In a Mediterranean hotel a breakfast costs £5. The bill for the room and breakfasts, at the end of 7 days, costs £315. How much does the room cost each day?

Dinosaur park

A group of adults and children decided to visit the dinosaur park. The adults paid twice as much as the children. The group paid £150. How many adults and children could have been in the group? Give two different answers.

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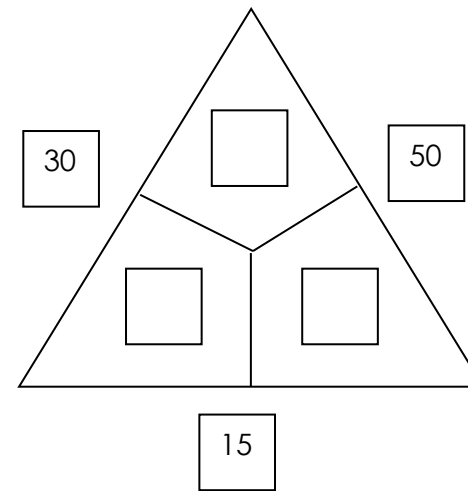
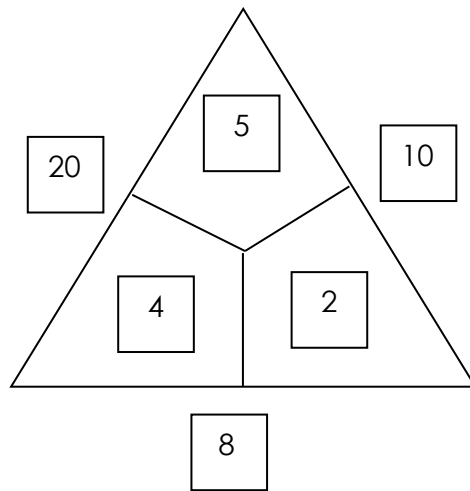
Holiday

A family of 2 adults and 4 children go on holiday. The air tickets cost £105 for each adult and £72 for each child. The hotel bill is £250 for all of them. How much does the family spend altogether?

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Multiple triangles

Look at the example on the left hand side below. Complete the problem on the right hand side, putting the correct numbers in the empty squares.



Dice multiplication and division

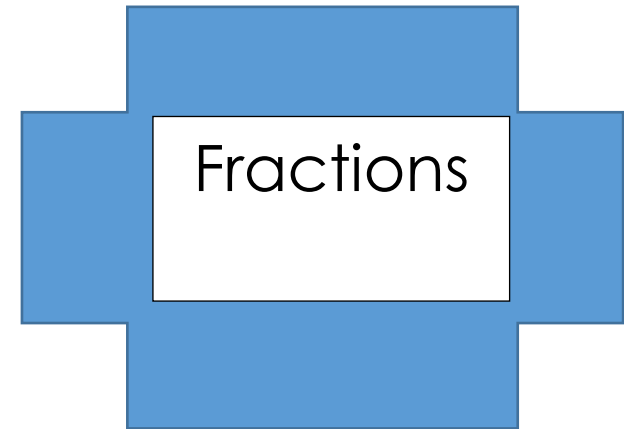


I threw 2 dice. The numbers when multiplied made 24. What were the numbers?

I threw 2 dice. The numbers when multiplied made 12. How many pairs of numbers could there have been? What are they?

I threw 2 dice. The numbers when divided made 2. What were the possible combination of the dice numbers?

I threw 2 dice. The numbers when divided made 3. What were the possible combination of the dice numbers?



Year 3: Fractions

Fractions	Count up and down in tenths; recognise that tenths arise from dividing an object into 10 equal parts and in dividing one-digit numbers or quantities by 10.
	Recognise, find and write fractions of a discrete set of objects: unit fractions and non-unit fractions with small denominators.
	Recognise and use fractions as numbers: unit fractions and non-unit fractions with small denominators.
	Recognise and show, using diagrams, equivalent fractions with small denominators.
	Add and sub fractions with the same denominator within one whole (e.g. $\frac{5}{7} + \frac{1}{7} = \frac{6}{7}$).
	Compare and order unit fractions, and fractions with the same denominators.

Ordering

Put these fractions in the correct order, starting with the smallest.

$4/8$

$3/4$

$1/4$

What do you notice?

Continue the pattern

$1/10 + 9/10 = 1$

$2/10 + 8/10 = 1$

$3/10 + 7/10 = 1$

Make up a similar pattern for eighths.

Gardening

A gardener has been very busy planting seeds. Work out how many of these become full grown plants by looking at the table below.

No of seeds	1500	500	300	1000
Name of plant	peas	pansies	cress	sunflowers
Fraction germinated	$\frac{1}{2}$	$\frac{1}{5}$	$\frac{2}{3}$	$\frac{3}{4}$
Answer				

Bowl of Fruit

One eighth of a bowl of fruit was made up of bananas. A quarter was made up of pears and a half was made up of apples.

If there were no more than 30 pieces of fruit altogether, how many bananas, pears and apples could there have been in the fruit bowl?

One tenth of a bowl of fruit was made up of kiwi fruit. Three tenths was made up of pears and a half was made up of apples.

If there were no more than 50 pieces of fruit altogether, how many kiwi fruit, pears and apples could there have been in the fruit bowl?

Garden centre

In a garden centre, the owner was working out how well his plants were selling. Work out how many of each plant he had sold.

Name of plant	Rose	Conifer bush	Camellia	Honeysuckle
Number of plants	60	60	30	40
Fraction sold	$\frac{2}{3}$	$\frac{1}{4}$	$\frac{1}{2}$	$\frac{3}{5}$
Answer				

In a forest

In a forest, the warden had to cut down a number of trees so that new ones could be planted. Work out how many of each type of tree is cut down.

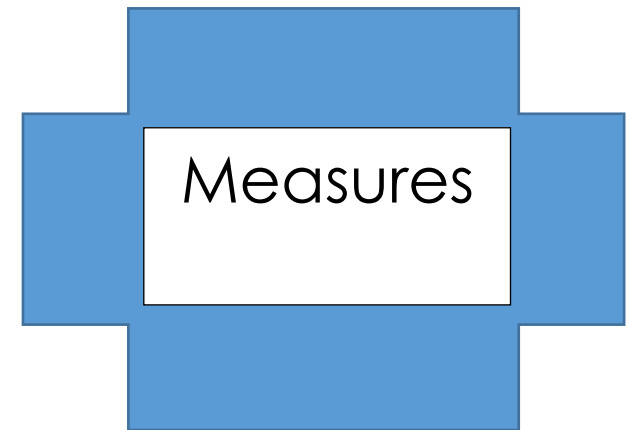
No of trees	200	500	300	1000
Name of tree	pine	oak	birch	sycamore
Fraction to be cut down	$\frac{1}{2}$	$\frac{2}{5}$	$\frac{2}{3}$	$\frac{1}{4}$
Answer				

On a Farm

On a farm there were sheep; chickens; cows and horses. $\frac{1}{2}$ of the animals were sheep, $\frac{1}{3}$ were chickens, $\frac{1}{10}$ were cows and the rest were horses.

If the farm had more than 200 animals but less than 230, how many sheep, chickens, cows and horses were there on the farm?

If there were more than 250 animals altogether but less than 280, how many sheep, chickens, cows and horses were there?



Year 3: Measures

Measures	Measure, compare, add and subtract: lengths (m/cm/mm); mass (kg/g); volume/capacity (l/ml).
	Measure the perimeter of simple 2-D shapes.
	Add and subtract amounts of money to give change, using both £ and p in practical contexts.
	Tell/write the time from an analogue clock, including Roman numerals from I to XII, and 12-hr/24-hr clocks.
	Estimate and read time with increasing accuracy, to nearest min; record/compare time in seconds, minutes, hrs. Use vocabulary such as o'clock, am/pm, morning, afternoon, noon and midnight.
	Know the number of seconds in a minute and the number of days in each month, year and leap year.

Ordering

Put these measurements in order starting with the largest.

Half a litre
Quarter of a litre
300 ml

500 metres
1Km
5000 cms

Position the symbols

Place the correct symbol between the measurements > or <

306 cm Half a metre
930 ml 1 litre

Explain your thinking

Undoing

A television programme lasting 45 minutes finished at 5.20. At what time did it start?

Draw a clock to show the start and finish times.

Explain thinking

Salha says that 100 minutes is the same as 1 hour.
Is Salha right? Explain your answer.

Write more statements

(You may choose to consider this practically)

If there are 630ml of water in a jug, how much water do you need to add to make a litre of water?

What if there was 450 ml to start with? Make up some more questions like this

Perimeter

The side of a square is equivalent to a whole number (in cms). Which of the following measurements could represent its perimeter?

8cm 18cm 24cm 25cm

Possibilities

I bought a book which cost between £9 and £10 and I paid with a ten pound note.
My change was between 50p and £1 and was all in silver coins. What price could I have paid?

The answer is...

25 minutes
What is the question?

45 minutes
What is the question?

What do you notice?

1 minute = 60 seconds 2 minutes = 120 seconds

Continue the pattern. Write down some more time facts like these.

Time and time again

How many hours are there in 2 days?

How many hours are there in 1 week?

It is now half past eight.

Helen has to be home by 11 o'clock and she is watching a film at her friend's house which lasts 2 hours. It takes 10 minutes to walk home.

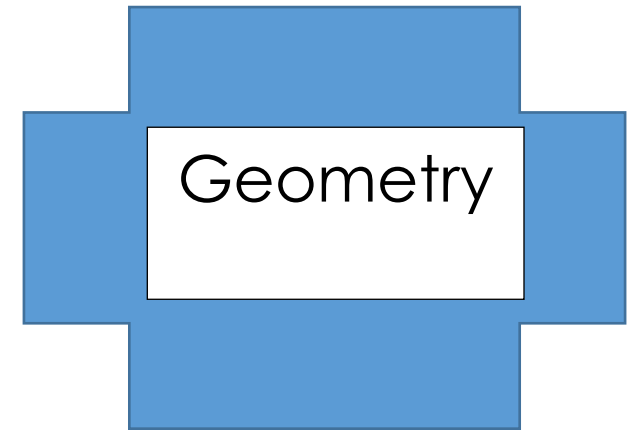
Has she enough time to watch all the film?

It is now one o'clock

Paul has to be home by half past three.

He is playing football for his team. The game lasts for 1 and a half hours. It takes half an hour to have a shower after the game and 15 minutes to get home.

Has he enough time to get home on time?



Year 3: Geometry

Geometry	Draw 2-D shapes and make 3-D shapes using modelling materials; recognise 3-D shapes in different orientations and describe them.
	Recognise that angles are a property of shape or a description of a turn.
	Identify right angles, recognise that 2 right angles make a half-turn, 3 make three quarters of a turn and 4 a complete turn. Identify whether angles are greater than or less than a right angle.
	Identify horizontal and vertical lines and pairs of perpendicular and parallel lines.

What's the same, what's different?

What is the same and different about these three 2-D shapes?



Visualising 3-D shapes

I am thinking of a 3-dimensional shape which has faces that are triangles and squares.
What could my shape be?

One face of a 3-D shape looks like this.



What could it be?

Are there any other possibilities?

Always, sometimes, never

Is it always, sometimes or never that all sides of a hexagon are the same length.

always

sometimes

never

Perpendicular or parallel

Which capital letters have perpendicular and / or parallel lines?

Working backwards

If I make the two opposite sides of a square 5 cm longer the new lengths of those sides are 27cm.
What was the length of the side of my original square?
What is the name and length of sides of my new shape?

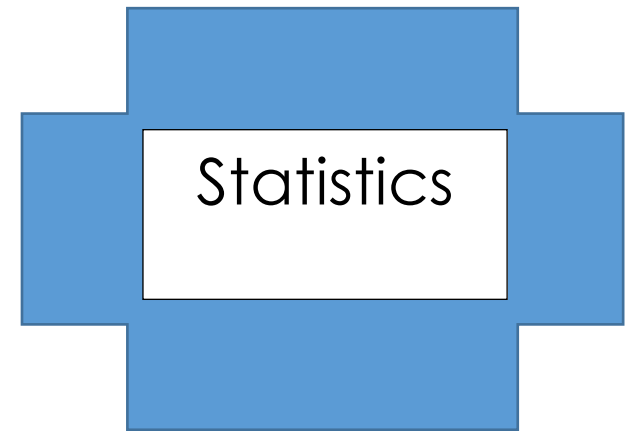
Drawing horizontal or vertical lines

Below, draw a horizontal line that is 5cm long and a vertical line that is 3 cm long.

Overlapping squares

How many squares can you make by overlapping 3 squares of the same size?





Year 3: Statistics

Stats	Interpret and present data using bar charts, pictograms and tables.
	Solve one-step and two-step questions such as 'How many more?' and 'How many fewer?' using information presented in scaled bar charts, pictograms and tables.

Science Lessons

In a science lesson children are looking at muscles and skeletons. They try to find out how much weight they can lift from the floor to their tummies. Here is a chart of their results.

Name	Weight (kg)
Pedro	18
Amir	23
Charlotte	17
India	19
Teacher	34

Who can lift the heaviest weight?

How much can India and Charlotte lift altogether?

Calculate the difference between the person who can lift the most and the person who can lift the least.

Television kids

Children in a class talk about how much television they watch each week. They decide to keep a record for 3 weeks and then put their information on this chart.

Pupil Name	Number of hours watched each week		
	Week 1	Week 2	Week 3
Danny	18	19	21
Libby	1	13	20
Hannah	17	12	18
Tony	30	15	36

Who watched most television over 3 weeks?

Which week was the most popular for watching television?

How many hours television did Hannah watch altogether?

Why might Libby have watched only 1 hour of television in Week 1?

Mini Olympics

In a mini Olympics event at school children score 3 points for coming first; 2 points for coming second and 1 point for coming third. Have a look at the chart below and then answer the questions.

Name	Running	Jumping	Throwing	Catching
Raisa		3rd		3rd
Helen	1st			
Tom			1st	
Amid	2nd	1st	2nd	1st
Ryan	3rd			
Ellie		2nd	3rd	2nd

Who won the running event?

Who won most events?

How many points did Ellie have altogether?

How many points did the winner collect?

Homework

Children in a class talk about the amount of time they spend doing homework. They decide to keep a record for 3 weeks and then put their information on this chart.

Pupil Name	Number of hours doing homework each week		
	Week 1	Week 2	Week 3
Sian	8	3	8
Ramesa	1	1	1
Richard	7	4	7
Billie	3	2	3

Create a block graph to show the number of hours spent by the four children doing homework during week 1.

Create another block graph to show how much homework Richard did over the 3 weeks.

(You should use squared paper to complete these graphs.)

Give a good reason why Ramesa only did 1 hour homework during weeks 1, 2 and 3.