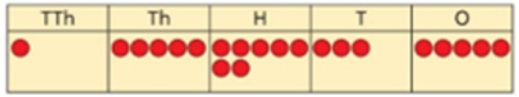
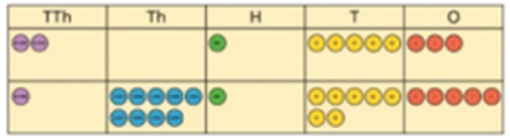
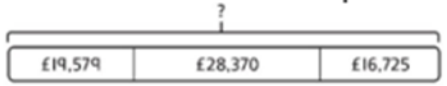
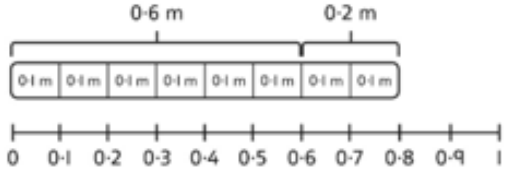
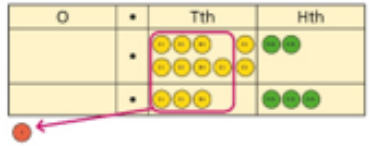
Helping your child with Maths at home

YEAR 5

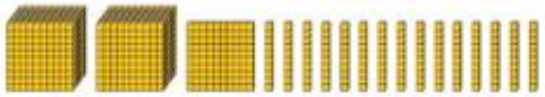
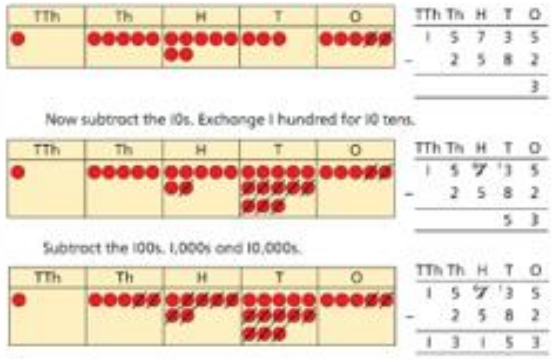
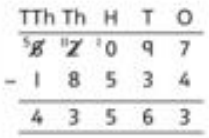
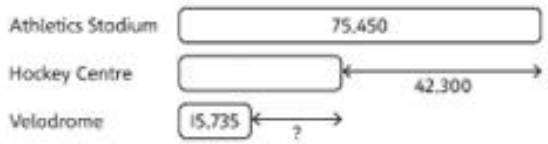
Addition

Year 5			
	Concrete	**Pictorial**	**Abstract**
Year 5 Addition			
Column addition with whole numbers	Use place value equipment to represent additions. *Add a row of counters onto the place value grid to show 15,735 + 4,012.* 	Represent additions, using place value equipment on a place value grid alongside written methods.  *I need to exchange 10 tens for a 100.* TTh Th H T O 2 0 1 5 3 + 1 9 1 7 5 3 9 3 2 8	Use column addition, including exchanges. TTh Th H T O 1 9 1 7 5 + 1 8 4 1 7 3 7 5 9 2
Representing additions		Bar models represent addition of two or more numbers in the context of problem solving. 	Use approximation to check whether answers are reasonable. TTh Th H T O 2 3 4 0 5 + 7 8 9 2 2 0 2 9 7 TTh Th H T O 2 3 4 0 5 + 7 8 9 2 3 1 2 9 7 *I will use 23,000 + 8,000 to check.*

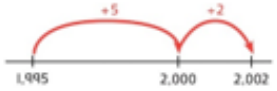
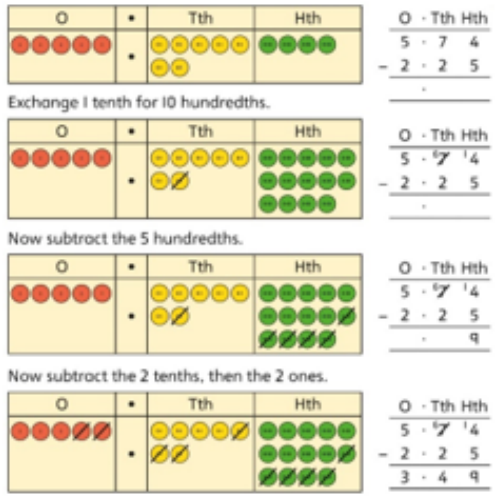
Addition continued

Adding tenths	Link measure with addition of decimals. *Two lengths of fencing are 0·6 m and 0·2 m.* *How long are they when added together?* 0·6 m 0·2 m 	Use a bar model with a number line to add tenths.  *0·6 + 0·2 = 0·8* *6 tenths + 2 tenths = 8 tenths*	Understand the link with adding fractions. $\frac{6}{10} + \frac{2}{10} = \frac{8}{10}$ *6 tenths + 2 tenths = 8 tenths* *0·6 + 0·2 = 0·8*
Adding decimals using column addition	Use place value equipment to represent additions. *Show 0·23 + 0·45 using place value counters.*	Use place value equipment on a place value grid to represent additions. Represent exchange where necessary.  O · Tth Hth 0 · 9 2 + 0 · 3 3 1 · 2 5 Include examples where the numbers of decimal places are different.  O · Tth Hth 5 · 0 0 + 1 · 2 5 6 · 2 5	Add using a column method, ensuring that children understand the link with place value. O · Tth Hth 0 · 2 3 + 0 · 4 5 0 · 6 8 Include exchange where required, alongside an understanding of place value. O · Tth Hth 0 · 9 2 + 0 · 3 3 1 · 2 5 Include additions where the numbers of decimal places are different. *3.4 + 0.65 = ?* O · Tth Hth 3 · 4 0 + 0 · 6 5

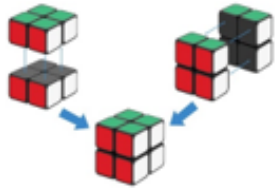
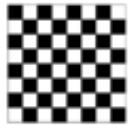
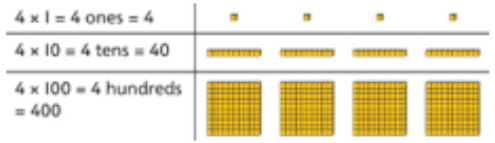
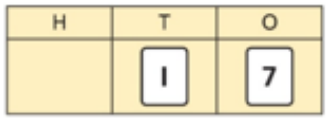
Subtraction

Year 5 Subtraction			
Column subtraction with whole numbers	Use place value equipment to understand where exchanges are required. *2,250 – 1,070* 	Represent the stages of the calculation using place value equipment on a grid alongside the calculation, including exchanges where required. *15,735 − 2,582 = 13,153* 	Use column subtraction methods with exchange where required.  *62,097 − 18,534 = 43,563*
Checking strategies and representing subtractions		Bar models represent subtractions in problem contexts, including 'find the difference'. 	Children can explain the mistake made when the columns have not been ordered correctly.  Use approximation to check calculations. *I calculated 18,000 + 4,000 mentally to check my subtraction.*

Subtraction continued

Choosing efficient methods			To subtract two large numbers that are close, children find the difference by counting on. *2,002 − 1,995 = ?*  Use addition to check subtractions. *I calculated 7,546 − 2,355 = 5,191.* *I will check using the inverse.*
Subtracting decimals	Explore complements to a whole number by working in the context of length.  1 m − ☐ m = ☐ m *1 − 0·49 = ?*	Use a place value grid to represent the stages of column subtraction, including exchanges where required. *5·74 − 2·25 = ?*  	Use column subtraction, with an understanding of place value, including subtracting numbers with different numbers of decimal places. *3·921 − 3·75 = ?* O · Tth Hth Thth 3 · 9 2 1 − 3 · 7 5 0

Multiplication

Year 5 Multiplication			
Understanding factors	Use cubes or counters to explore the meaning of 'square numbers'. *25 is a square number because it is made from 5 rows of 5.* Use cubes to explore cube numbers.  *8 is a cube number.*	Use images to explore examples and non-examples of square numbers.  *8 × 8 = 64* *8^2 = 64*  *12 is not a square number, because you cannot multiply a whole number by itself to make 12.*	Understand the pattern of square numbers in the multiplication tables. Use a multiplication grid to circle each square number. Can children spot a pattern?
Multiplying by 10, 100 and 1,000	Use place value equipment to multiply by 10, 100 and 1,000 by unitising.  	Understand the effect of repeated multiplication by 10. 	Understand how exchange relates to the digits when multiplying by 10, 100 and 1,000.  *17 × 10 = 170* *17 × 100 = 17 × 10 × 10 = 1,700* *17 × 1,000 = 17 × 10 × 10 × 10 = 17,000*

Multiplication continued

<table>
<tr>
<td>Multiplying 2-digit numbers by 2-digit numbers</td>
<td>Partition one number into 10s and 1s, then add the parts.

23 × 15 = ?

 
10 × 15 = 150

10 × 15 = 150

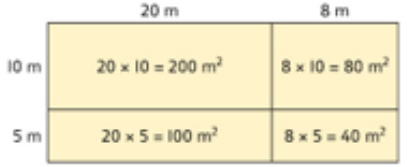
 
3 × 15 = 45

H T O
1 5 0
1 5 0
+ 4 5
3 4 5
1

There are 345 bottles of milk in total.

23 × 15 = 345</td>
<td>Use an area model and add the parts.

28 × 15 = ?

 
20 m | 8 m
10 m: 20 × 10 = 200 m² | 8 × 10 = 80 m²
5 m: 20 × 5 = 100 m² | 8 × 5 = 40 m²

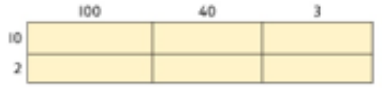
H T O
2 0 0
1 0 0
8 0
+ 4 0
4 2 0
1

28 × 15 = 420</td>
<td>Use column multiplication, ensuring understanding of place value at each stage.

3 4
× 2 7
2 3 8 (2) 34 × 7

3 4
× 2 7
2 3 8 (2) 34 × 7
6 8 0 34 × 20

3 4
× 2 7
2 3 8 (2) 34 × 7
6 8 0 34 × 20
9 1 8 34 × 27
1</td>
</tr>
<tr>
<td>Multiplying up to 4-digits by 2-digits</td>
<td></td>
<td>Use the area model then add the parts.

 
100 | 40 | 3
10 | | | |
2 | | | |

143 × 12 = 1,716

There are 1,716 boxes of cereal in total.

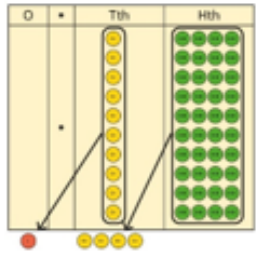
Th H T O
1 0 0 0
4 0 0
2 0 0
8 0
3 0
+ 6
1 7 1 6
1

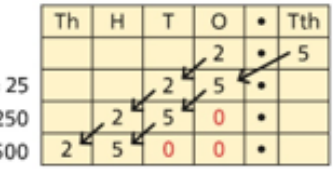
143 × 12 = 1,716</td>
<td>Use column multiplication, ensuring understanding of place value at each stage.

1 4 3
× 1 2
2 8 6 143 × 2
1 4 3 0 143 × 10
1 7 1 6 143 × 12
1

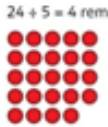
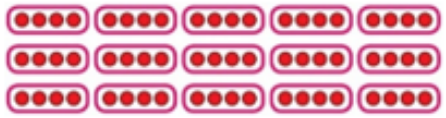
Progress to include examples that require multiple exchanges as understanding, confidence and fluency build.</td>
</tr>
</table>

Multiplication continued

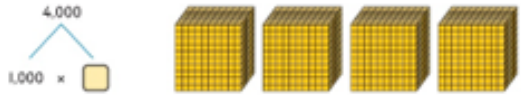
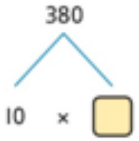
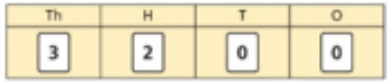
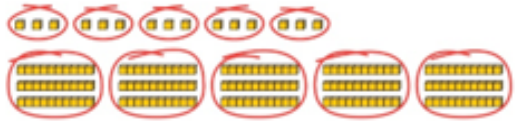
			1,274 × 32 = ? *First multiply 1,274 by 2.* 1 2 7 4 × 3 2 = 2 5 (1) 4 8 (1,274 × 2) *Then multiply 1,274 by 30.* 1 2 7 4 × 3 2 = 2 5 (1) 4 8 (1,274 × 2); 3 8 (2) 2 (1) 2 0 (1,274 × 30) *Finally, find the total.* 1 2 7 4 × 3 2 = 2 5 (1) 4 8 (1,274 × 2); 3 8 (2) 2 (1) 2 0 (1,274 × 30); 4 0 7 6 8 (1,274 × 32) *1,274 × 32 = 40,768*
Multiplying decimals by 10, 100 and 1,000	Use place value equipment to explore and understand the exchange of 10 tenths, 10 hundredths or 10 thousandths.	Represent multiplication by 10 as exchange on a place value grid.  *0·14 × 10 = 1·4*	Understand how this exchange is represented on a place value chart. 2·5 × 10 = 25 2·5 × 100 = 250 2·5 × 1,000 = 2,500 Th H T O • Tth 2 • 5 2 5 •



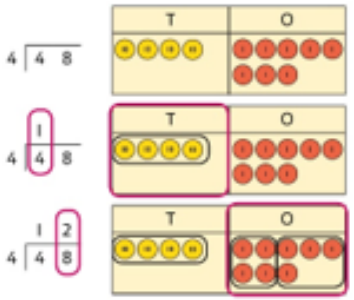
Division

Year 5 Division			
Understanding factors and prime numbers	Use equipment to explore the factors of a given number.  *24 ÷ 3 = 8* *24 ÷ 8 = 3* *8 and 3 are factors of 24 because they divide 24 exactly.*  *5 is not a factor of 24 because there is a remainder.*	Understand that prime numbers are numbers with exactly two factors. *13 ÷ 1 = 13* *13 ÷ 2 = 6 r 1* *13 ÷ 4 = 4 r 1* *1 and 13 are the only factors of 13.* *13 is a prime number.*	Understand how to recognise prime and composite numbers. *I know that 31 is a prime number because it can be divided by only 1 and itself without leaving a remainder.* *I know that 33 is not a prime number as it can be divided by 1, 3, 11 and 33.* *I know that 1 is not a prime number, as it has only 1 factor.*
Understanding inverse operations and the link with multiplication, grouping and sharing	Use equipment to group and share and to explore the calculations that are present. *I have 28 counters.* *I made 7 groups of 4. There are 28 in total.* *I have 28 in total. I shared them equally into 7 groups. There are 4 in each group.* *I have 28 in total. I made groups of 4. There are 7 equal groups.*	Represent multiplicative relationships and explore the families of division facts.  *60 ÷ 4 = 15* *60 ÷ 15 = 4*	Represent the different multiplicative relationships to solve problems requiring inverse operations.  Understand missing number problems for division calculations and know how to solve them using inverse operations. *22 ÷ ? = 2* *22 ÷ 2 = ?* *? ÷ 2 = 22* *? ÷ 22 = 2*

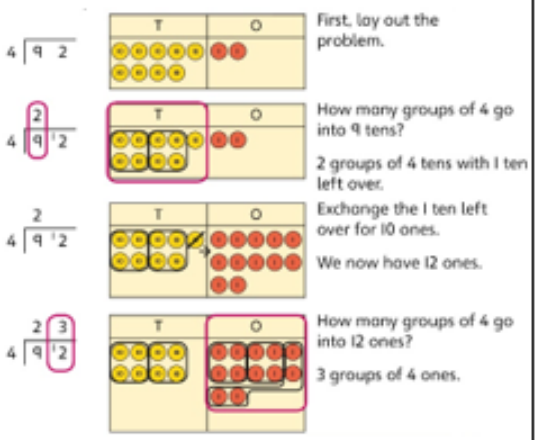
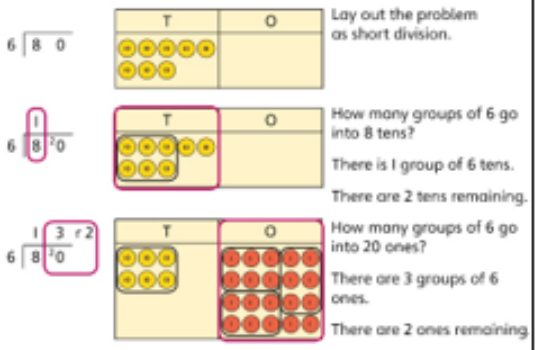
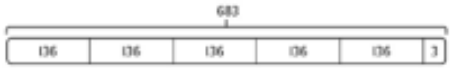
Division continued

Dividing whole numbers by 10, 100 and 1,000	Use place value equipment to support unitising for division. *4,000 ÷ 1,000*  *4,000 is 4 thousands.* *4 × 1,000= 4,000* *So, 4,000 ÷ 1,000 = 4*	Use a bar model to support dividing by unitising. *380 ÷ 10 = 38*   *380 is 38 tens.* *38 × 10 = 380* *10 × 38 = 380* *So, 380 ÷ 10 = 38*	Understand how and why the digits change on a place value grid when dividing by 10, 100 or 1,000.  *3,200 ÷ 100 = 2* *3,200 is 3 thousands and 2 hundreds.* *200 ÷ 100 = 2* *3,000 ÷ 100 = 30* *3,200 ÷ 100 = 32* *So, the digits will move two places to the right.*
Dividing by multiples of 10, 100 and 1,000	Use place value equipment to represent known facts and unitising.  *15 ones put into groups of 3 ones. There are 5 groups.* *15 ÷ 3 = 5* *15 tens put into groups of 3 tens. There are 5 groups.* *150 ÷ 30 = 5*	Represent related facts with place value equipment when dividing by unitising.  *180 is 18 tens.* *18 tens divided into groups of 3 tens. There are 6 groups.* *180 ÷ 30 = 6*	Reason from known facts, based on understanding of unitising. Use knowledge of the inverse relationship to check. *3,000 ÷ 5 = 600* *3,000 ÷ 50 = 60* *3,000 ÷ 500 = 6* *5 × 600 = 3,000* *50 × 60 = 3,000* *500 × 6 = 3,000*

Division continued

		 *12 ones divided into groups of 4. There are 3 groups.* *12 hundreds divided into groups of 4 hundreds. There are 3 groups.* *1200 ÷ 400 = 3*	
Dividing up to four digits by a single digit using short division	Explore grouping using place value equipment. *268 ÷ 2 = ?* *There is 1 group of 2 hundreds.* *There are 3 groups of 2 tens.* *There are 4 groups of 2 ones.* *264 ÷ 2 = 134*	Use place value equipment on a place value grid alongside short division. The model uses grouping. A sharing model can also be used, although the model would need adapting.  Lay out the problem as a short division. *There is 1 group of 4 in 4 tens.* *There are 2 groups of 4 in 8 ones.*	Use short division for up to 4-digit numbers divided by a single digit. $$7 \overline{)\,3\,{}^{3}8\,{}^{3}9\,{}^{4}2} \quad 0\;5\;5\;6$$ *3,892 ÷ 7 = 556* Use multiplication to check. *556 × 7 = ?* *6 × 7 = 42* *50 × 7 = 350* *500 × 7 = 3500* *3,500 + 350 + 42 = 3,892*

Division continued

		Work with divisions that require exchange.  	
Understanding remainders	Understand remainders using concrete versions of a problem. *80 cakes divided into trays of 6.*  *80 cakes in total. They make 13 groups of 6, with 2 remaining.*	Use short division and understand remainders as the last remaining 1s.  	In problem solving contexts, represent divisions including remainders with a bar model.  *683 = 136 × 5 + 3* *683 ÷ 5 = 136 r 3*

Times Tables

A good knowledge and quick recall of times tables is essential to children's mathematical progress. It is expected that the children know up to 12 x 12.

It is very important that children practice their times tables daily at home. When learning their tables, children are taught to look for patterns such as odd and even number answers, or patterns made by adding together the separate digits in the answers. Children are also taught to recognise the reversible effect so that they know 6 x 2 is the same as 2 x 6.

The children are also taught the relationship with division so that knowing 6 x 2 = 12 means they also know that 12 ÷ 2 = 6 and 12 ÷ 6 = 2. For each known times table fact, they also know three others: 6 x 7 = 42 so they know that 7 x 6 = 42; 42 ÷ 6 = 7 ; 42 ÷ 7 = 6 .

Times tables - Say together the six times table forwards, then backwards. Ask your child questions, such as: Nine sixes? How many sixes in 42? Six times four? Forty-eight divided by six? Three multiplied by six? Six times what equals sixty? Repeat with other times tables.

Rhymes - Make up rhyme together to help your child to remember the harder times-tables facts, e.g. 6 x 7 = 42 phew! 7 x 7 = 49 fine! 6 x 8 = 48 great!

Talk about Maths in everyday situations

- How much? While shopping, point out an item costing less than £1. Ask your child to work out in their head the cost of 3 items. Ask them to guess first. See how close they come. If you see any items labelled, for example, '2 for £3.50', ask them to work out the cost of 1 item for you, and to explain how they got the answer.

- Weighing, measuring capacity and timing when cooking. Converting a recipe for 4 people to one for 6 people. (Scale a recipe up or down to feed the right amount of people.)

- Being involved with measuring and calculating how much curtain fabric is needed, how much wood for shelves, how many wall or floor tiles are needed, how much carpet etc.

- Talking about time, e.g. How long is it until lunch time? The journey takes 2½ hours, when will we arrive? We need to be there at 2.00 pm, when do we need to leave home? Many children will still need practice with reading clock times, particularly minutes past and minutes to the hour.

Measuring

- What is the perimeter of your garden? What is the area of your garden? If you wanted to plant 10 trees down one side of your garden, equally spaced, how far apart would they need to be?

- Practise measuring the lengths and heights of objects in metric measurements. Help your child use different rulers or tape measures correctly. Encourage them to estimate before measuring. Compare measurements in metric and imperial.

- Let your child help with the cooking. Help them to measure ingredients accurately. Talk about what each division on a scale represents. Find a recipe for 4 people and rewrite it for 8 people, e.g. 4 people 8 people 125g flour 250g flour 50g butter 100g butter 75g sugar 150g sugar 30ml treacle 60ml treacle 1 teaspoon ginger 2 teaspoons ginger Can you rewrite it for 3 people? Or 5 people?

- Choose some food items out of the cupboard. Try to put the objects in order of weight by feel alone. Then check by looking at the weights on the packets.

- Use a tape measure that shows centimetres. Take turns measuring lengths of different objects, e.g. the length of a sofa, the width of a table, the length of the bath, the height of a door. Record the measurement in centimetres, or metres and centimetres if it is more than a metre, e.g. if the bath is 165 cm long, you could say it is 1m 65cm (or 1.65m). Write all the measurements in order

- Make a list of the abbreviations used in the recipe and then write them in full – for example, L for litre, ml for millilitre, tsp. for teaspoon, tbsp. for tablespoon.

Money and percentages

Discussing catalogues can be a great way to improve your child's maths knowledge of money and percentages. Here are some questions you could ask:

- How would you spend £40 from a catalogue? How many products can you buy for £40?
- Select five products from the catalogue, then calculate what the cost would be if there was a 50% sale. Does it make a difference if you add up the items, and then deduct 50%, or if each item is reduced by 50% then totalled?

Investigate costs for family trips together. For example, a visit to a theme park may include the cost of transport, entry tickets, food and transport.

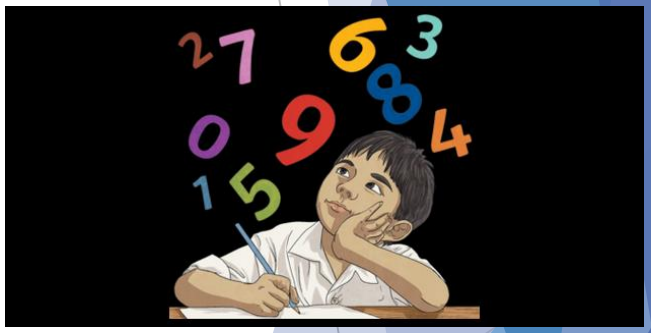
- Discuss saving money for presents or something your child may want to buy. Work out how long it will take to save this much if they get a small amount of money each week.
- Negotiate increases in pocket money as percentages. For example, a 5% increase would be how much money per week? Is this better than a monthly increase
- Calculate together how much a mobile phone costs per month. What percentage of total cost is spent on messages and what percentage on phone calls?

Ask your child to explain their mathematical thinking.

- Explaining your reasoning… Solve the following calculations: ‘When working with whole numbers, if you add two 2-digit numbers together the answer cannot be a 4-digit number.’ Do you agree? Explain your reasoning.

- Millie wanted to buy a coat that cost £80. She saw the coat on sale in one shop at 1/5 off. She saw the same coat on sale in another shop at 25% off. Which shop has the coat at a cheaper price?

- What is the same about these shapes? What is different?



Worded problems

- 13502 people were at the match last week and there are 2483 more this week, how many more people need to attend to bring the total to the club’s target of 20 000 people?

- Egg boxes hold 6 eggs. A farmer collects 439 eggs. How many boxes can he fill? Egg boxes hold 6 eggs. How many boxes must a restaurant buy to have 200 eggs?

Sports provide a good opportunity to engage your child in maths, particularly if they are a keen sportsperson.

Here are some questions to ask your child when watching or playing their favourite sport:

- How does your favourite sport tally the score? What maths is presented on the tally?
- How do other sports tally the score – for example, tennis, golf, cricket, netball, football?
- What maths do you use to find the total of the scores?
- How long do your favourite sport games go for in minutes and seconds? How is the time in the game divided? Into halves, quarters or something else?
- What are the shapes of different playing fields and courts? Talk about edges and angles.
- How can you estimate the perimeter and area of a playing field?

When faced with a calculation problem, encourage your child to ask…

- Can I do this in my head?
- Could I do this in my head using drawings or jottings to help me?
- Do I need to use a written method?
- Should I use a calculator?

Measurement of weight and volume

There are lots of practical opportunities to use measurement at home. Children need to know about both metric and imperial units.

There are 1000 grams in a kilogram and 1000 mililitres in a litre. Raid the food cupboards and see if they can find packets and cans which are in grams and add up to a kilogram.

Can they estimate the weight of packets?

Enjoy cooking! Follow recipes together and measure out the correct amounts. Compare the imperial and metric measurements the recipe has.

Measurement of time

Look at how long a days activities take. How long did they spend at the park? How long did it take to eat breakfast? Can they change the measurement to a different one? Minutes to seconds? Hours to minutes?

Get them to plan a day out using measurements of time. Which units did they use? Minutes? Hours? Seconds? Why did they choose these units?

Perimeter and area

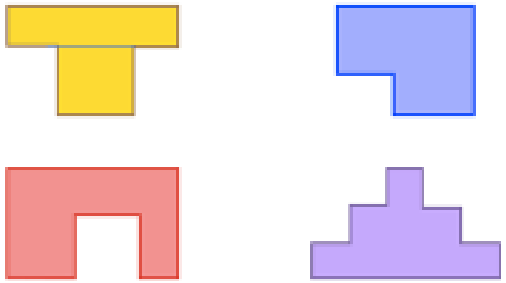
Perimeter is the area around a shape. Imagine you are walking around the outside of a football pitch. This is the perimeter.

Use lego to make a shape. Measure the sides to find the perimeter.

Use masking tape and mark out a shape on the kitchen floor. Can you find the perimeter?

Area is the space inside the shape. To find the area we multiply the width by the length.

The area is 8cm x 3 cm = 24cm$^{2.}$

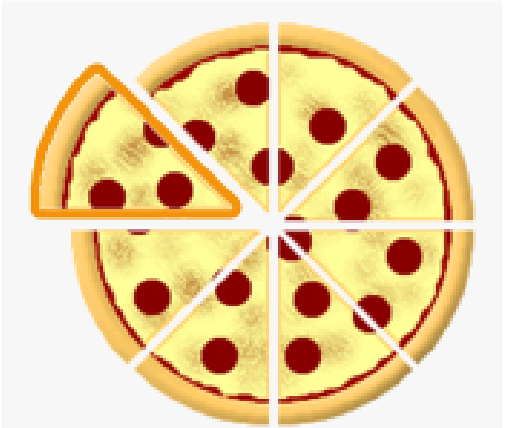


These are rectilinear shapes – shapes made up of rectangles. To find the area we have to divide up the shape into rectangles like the yellow shape is. Then we find the area of each rectangle and add the areas together.

Can you find any shapes around the house that are rectilinear? Work out the area.

Fractions

Use a pizza to look at fractions. Cut it into pieces. The number of pieces is the denominator. If they eat a piece what fraction is left?



$\frac{2}{8}$ ← numerator

$\frac{2}{8}$ ← denominator

A fraction is part of a whole number

Food is a great way of practicing fractions using mathematical language.

Use smarties to look at fractions of amounts. The tube is one whole. What fraction are red? What fraction are blue? What is $\frac{1}{4}$ of a tube of smarties?