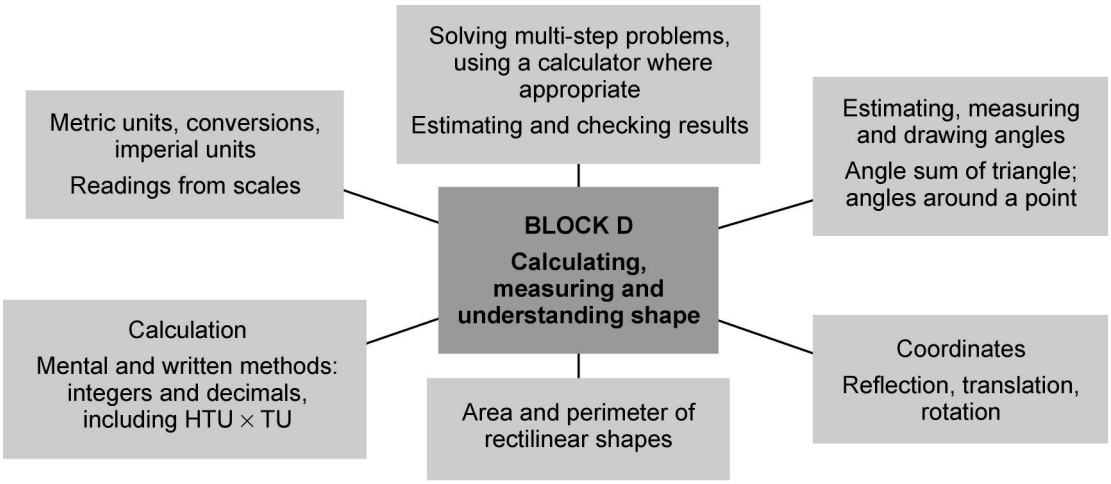
Year 6: Block D — Three 2-week units

Calculating, measuring and understanding shape



Objectives End-of-year expectations (key objectives) are highlighted	Units 1	 2	 3
• Solve multi-step problems, and problems involving fractions, decimals and percentages; choose and use appropriate calculation strategies at each stage, including calculator use	✓	✓	✓
• Calculate mentally with integers and decimals: U.t ± U.t, TU × U, TU ÷ U, U.t × U, U.t ÷ U	✓	✓	✓
• Use efficient written methods to add and subtract integers and decimals, to multiply and divide integers and decimals by a one-digit integer, and to multiply two-digit and three-digit integers by a two-digit integer	✓	✓	✓
• Use a calculator to solve problems involving multi-step calculations	✓	✓	✓
• Use approximations, inverse operations and tests of divisibility to estimate and check results	✓	✓	✓
• Select and use standard metric units of measure and convert between units using decimals to two places (e.g. change 2.75 litres to 2750 ml, or vice versa)	✓	✓	✓
• Solve problems by measuring, estimating and calculating; measure and calculate using imperial units still in everyday use; know their approximate metric values	✓		✓
• Read and interpret scales on a range of measuring instruments, recognising that the measurement made is approximate and recording results to a required degree of accuracy; compare readings on different scales, for example when using different instruments	✓		✓
• Calculate the perimeter and area of rectilinear shapes; estimate the area of an irregular shape by counting squares	✓		✓
• Estimate angles, and use a protractor to measure and draw them, on their own and in shapes; calculate angles in a triangle or around a point		✓	
• Use coordinates in the first quadrant to draw, locate and complete shapes that meet given properties		✓	

Objectives	Units		
End-of-year expectations (key objectives) are highlighted	1	2	3
• Visualise and draw on grids of different types where a shape will be after reflection, after translations, or after rotation through 90° or 180° about its centre or one of its vertices		✓	

Speaking and listening objectives for the block

Objectives	Units		
	1	2	3
• Use a range of oral techniques to present persuasive argument	✓		
• Participate in a whole-class debate using the conventions and language of debate		✓	
• Analyse and evaluate how speakers present points effectively through use of language, gesture, models and images			✓

Opportunities to apply mathematics in science

Activities		Units		
		1	2	3
6e	Forces in action: When measuring forces, use force meters with accuracy, e.g. to one or two decimal places.	✓		
6f	How we see things: Use a protractor to measure the angle of a light beam and its reflection. Measure shadows to an appropriate degree of accuracy.		✓	
6e	Forces in action: When investigating paper spinners, calculate their surface areas, and establish whether this is related to the time to fall.			✓

Key aspects of learning: focus for the block

Enquiry	**Problem solving**	Reasoning	Creative thinking
Information processing	**Evaluation**	Self-awareness	Managing feeling
Social skills	Communication	Motivation	Empathy

Vocabulary

problem, solution, answer, method, strategy, compare, order, explain, predict, reason, reasoning, pattern, relationship

operation, calculation, calculate, equation, decimal, decimal point, decimal place, add, subtract, multiply, divide, sum, total, difference, plus, minus, product, quotient, remainder, calculator, memory, display, key, enter, clear

numerator, denominator, divisible by, multiple, factor

measure, estimate, approximately, metric unit, standard unit, length, distance, perimeter, area, surface area, mass, weight, capacity, angle, degree (°), angle measurer, protractor, set-square, balance, scales, units of measurement and their abbreviations, pound (£), penny/pence (p)

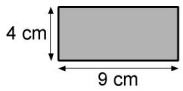
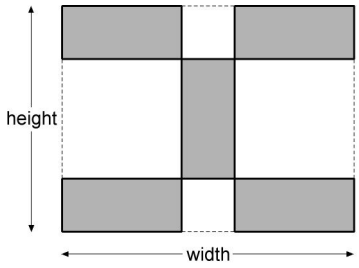
position, direction, reflection, reflective symmetry, line of symmetry, mirror line, rotation, centre of rotation, clockwise, anticlockwise, translation, origin, coordinates, x-coordinate, y-coordinate, x-axis, y-axis, axes, quadrant

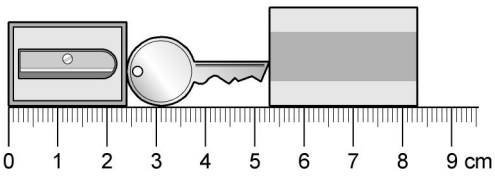
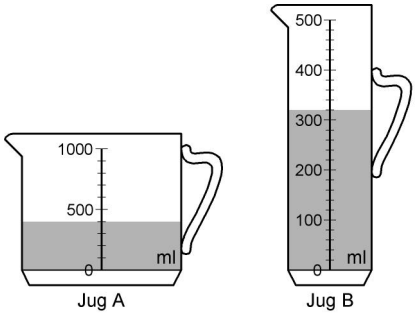
Building on previous learning

Check that children can already:

- solve one- and two-step problems involving whole numbers and decimals, explaining their methods, and using a calculator where appropriate
- multiply and divide whole numbers and decimals by 10, 100 or 1000
- mentally multiply a two-digit by a one-digit number (e.g. 12 × 9) and multiply by 25 (e.g. 16 × 25)
- use efficient written methods to multiply and divide HTU × U, TU × TU, U.t × U and HTU ÷ U
- apply their knowledge of multiplication and division facts to estimate and check results
- use standard metric units to estimate and measure length, weight and capacity
- convert larger to smaller units using decimals to one place, e.g. change 2.6 kg to 2600 g
- measure and calculate the perimeter of regular and irregular polygons; use the formula for the area of a rectangle to calculate its area
- read and plot coordinates in the first quadrant
- identify lines of symmetry in 2-D shapes; draw the position of a shape after a reflection or translation
- estimate, draw and measure acute and obtuse angles using an angle measurer or protractor
- calculate angles on a straight line

Unit 6D1 2 weeks

Objectives *Children's learning outcomes in italic*	Assessment for learning
• Solve multi-step problems, and problems involving fractions, decimals and percentages; choose and use appropriate calculation strategies at each stage, including calculator use *I can solve problems with several steps and decide how to carry out the calculation*	Each tile is 4 centimetres by 9 centimetres.  Here is a design made with the tiles.  Calculate the width and height of the design. Write down the calculations that you did. Did you use a written method or a calculator? Explain why.
• Calculate mentally with integers and decimals: U.t ± U.t, TU × U, TU ÷ U, U.t × U, U.t ÷ U *I can add, subtract, multiply and divide whole numbers and decimals in my head*	Which of these subtractions can you do without writing anything down? Why is it possible to solve this calculation mentally? What clues did you look for? I need two shelves each 1.4 metres in length. I cut the two shelves from a plank 5 metres long. How much of the plank is left? Explain the mental calculations that you did to solve this problem.
• Use efficient written methods to add and subtract integers and decimals, to multiply and divide integers and decimals by a one-digit integer, and to multiply two-digit and three-digit integers by a two-digit integer *I can add, subtract, multiply and divide whole numbers and decimals using efficient written methods*	Show me the calculation that you would do to solve this problem. A bottle holds 1 litre of lemonade. Rachel fills 5 glasses with lemonade. She puts 150 millilitres in each glass. How many glasses does she fill?
• Use a calculator to solve problems involving multi-step calculations *I can use a calculator to solve problems with several steps*	What key presses would you make on a calculator to work out 2 × (21.9 + 8.7)? Peter has £10. He buys 3 kg of potatoes at 87p per kg and 750 g of tomatoes at £1.32 per kg. How much money does he have left? Show me how you used your calculator to find the answer.
• Use approximations, inverse operations and tests of divisibility to estimate and check results *I can estimate the result of a calculation* *I know several ways of checking answers*	Roughly, what will the answer to this calculation be? How do you know that this calculation is probably right? Could you check it a different way? Should the answer be odd or even? How do you know?

Objectives *Children's learning outcomes in italic*	Assessment for learning
• Select and use standard metric units of measure and convert between units using decimals to two places (e.g. change 2.75 litres to 2750 ml, or vice versa) *I can convert one measurement to another using a related unit. I use decimals to do this*	What units are used to measure capacity? Roughly what is the capacity in millilitres of a typical coffee mug? (250 to 300 ml) Of an egg cup? (50 ml) Of a teaspoon? (5 ml) What is the capacity in litres of a kitchen bucket? (about 10 litres) What units are used to measure weight? Roughly what is the average weight of newborn baby? (3 to 4 kg) Of a medium-sized chicken? (2 kg) Of an apple? (150 to 200 g) Of one lump of sugar? (5 g) What units are used to measure length? Roughly what is the height of the classroom door? (2 m) The length of a piece of A4 paper? (30 cm) The width of the palm of your hand? (7 to 8 cm)
• Solve problems by measuring, estimating and calculating; measure and calculate using imperial units still in everyday use; know their approximate metric values *I know that 1 pint is just over half a litres, and that 1 litre is about $1\frac{3}{4}$ pints* *I know that 1 mile is about 1.6 km, and that 1 km is about $\frac{5}{8}$ of a mile*	How many pints are about the same as one litre? Ring the best answer: 1 2 3 4 5 Write the correct whole number in the box. 5 miles is approximately ☐ kilometres.
• Read and interpret scales on a range of measuring instruments, recognising that the measurement made is approximate and recording results to a required degree of accuracy; compare readings on different scales, for example when using different instruments *I can read scales as accurately as a problem requires* *I can compare readings from different scales*	Here are a pencil sharpener, a key and an eraser. **Actual size**  What is the length of the key? Give your answer in millimetres. The diagram shows the volume of water in two measuring jugs.  Which jug contains more water, A or B? How much more does it contain? Explain how you worked it out.
• Calculate the perimeter and area of rectilinear shapes; estimate the area of an irregular shape by counting squares *I can find the perimeter and area of shapes and estimate the area of irregular shapes*	Tell me a rule for working out the area of a rectangle. Will it work for all rectangles? The area of a rectangle is 32 cm^2. What are the lengths of the sides? Are there other possible answers? Show me something that has an area of approximately 100 cm^2. What did you use to help you? Estimate the area of the front cover of this paperback book. How did you go about doing that?

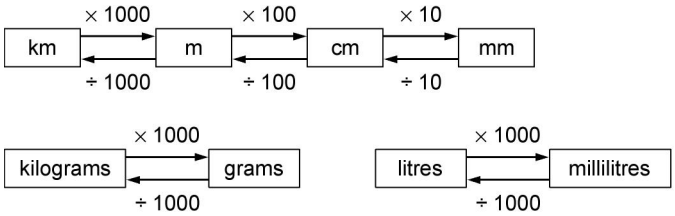
Objectives *Children's learning outcomes in italic*	Assessment for learning
• Use a range of oral techniques to present persuasive argument *I can use different techniques to persuade people*	Convince your partner that a good estimate for the perimeter of the classroom is 25 metres, and that a good estimate for its area is 35 square metres. Tim says a square with sides of 8 cm has an area of 32 cm^2. Do you agree with him? Why or why not?

Learning overview

Children **solve practical problems** by **estimating and measuring using standard metric units.** They consider benchmarks to help them to estimate lengths, such as the height of a door (about 2 metres) or the length of a pencil (about 20 cm). They **measure and compare** lengths using rulers, metre sticks and tape measures, including a surveyor's tape for measuring longer distances outdoors. They learn how a car mileometer measures longer distances. They study local maps and use a simple scale to compare map distance with actual distance.

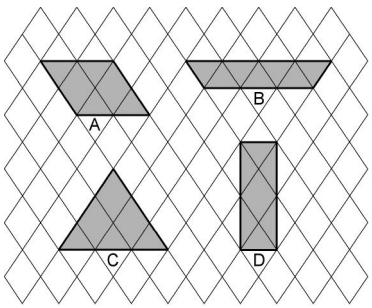
Children continue to **read measurements from a range of scales**. They weigh the same object on kitchen scales and bathroom scales and decide which is more suitable for the task. They measure a length using a metre stick marked only in centimetres and with a measuring tape marked in centimetres and millimetres, and decide which gives the more accurate reading. They learn to use a ruler to measure the length of an object when it is impossible to place the end of the object at the zero mark of the ruler.

Children **convert between units** as necessary, drawing on their knowledge of multiplying and dividing whole numbers and decimals by 10, 100 and 1000. For example, they give 3.2 litres in millilitres, 3544 g in kilograms, 2.1 metres in mm, 385 minutes in hours and minutes or 3.2 hours in hours and minutes.



Children have an occasional opportunity to work with **imperial units** still in everyday use (such as pints or miles). They know the approximate equivalent metric values of these units and use these to make simple conversions. For example, they use the fact that 5 miles is approximately 8 kilometres to work out the approximate length of a 15 mile walk in kilometres.

Children extend their understanding of **area and perimeter**. They **estimate the area of irregular shapes by counting squares**. For example, they estimate the area of a banana skin using an acetate grid. They use centimetre squared paper to draw an L-shape or a T-shape with an area of, say, 22 cm^2. They calculate the area of an L-shaped garden, using their knowledge of the area of a rectangle, and the length of fence needed for its boundary.



Which two shapes are equal in area? How do you know?

Children **solve multi-step problems** involving measures. They decide what calculation(s) to do and estimate the answers. They choose **appropriate** and **efficient** methods, including mental methods, and using a calculator where appropriate. They check their answers against their estimates and

consider them in the context of the problem to make sure that they are reasonable. They **compare different methods** and **justify their choices**. For example, they solve problems such as:

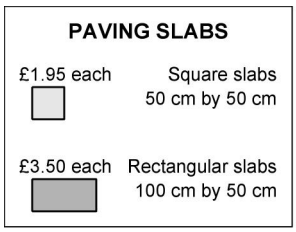
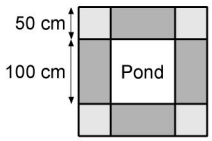
The temperature inside an aeroplane is 20 °C. The temperature outside the aeroplane is –30 °C. What is the difference between these temperatures?

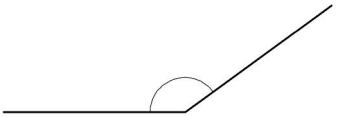
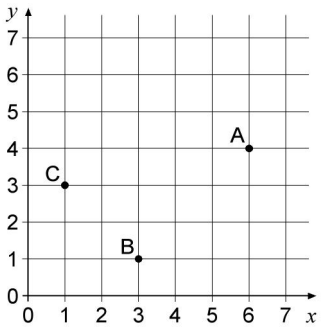
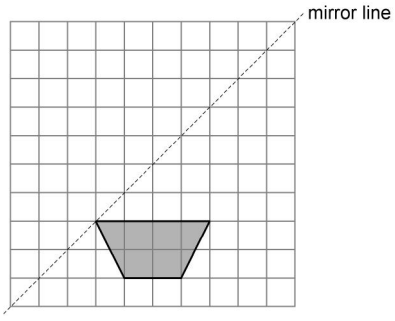
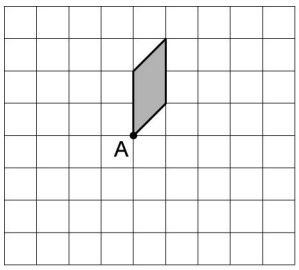
The area of a rectangle is 16 cm^2. One of the sides is 2 cm long. What is the perimeter of the rectangle?

Peanuts cost 60p for 100 grams. What is the cost of 350 grams of peanuts?

Raisins cost 80p for 100 grams. Jack pays £2 for a bag of raisins. How many grams of raisins does he get?

Unit 6D2 2 weeks

Objectives *Children's learning outcomes in italic*	Assessment for learning
• Solve multi-step problems, and problems involving fractions, decimals and percentages; choose and use appropriate calculation strategies at each stage, including calculator use *I can solve problems with several steps and decide how to carry out the calculation*	Mr Singh buys paving slabs to go around his pond.   He buys 4 rectangular slabs and 4 square slabs. What is the total cost of the slabs he buys? Mr Singh says: 'It would cost more to use square slabs all the way round.' Explain why Mr Singh is correct. How did you decide whether Mr Singh was right or wrong? What calculations did you do?
• Calculate mentally with integers and decimals: U.t ± U.t, TU × U, TU ÷ U, U.t × U, U.t ÷ U *I can add, subtract, multiply and divide whole numbers and decimals in my head*	The answer is 10.6 kg. What was the question? In a café I buy two cups of coffee and a sandwich. Altogether I pay three pounds. The sandwich costs one pound sixty. What is the cost of one cup of coffee? Explain the mental calculations that you did to solve this problem.
• Use efficient written methods to add and subtract integers and decimals, to multiply and divide integers and decimals by a one-digit integer, and to multiply two-digit and three-digit integers by a two-digit integer *I can add, subtract, multiply and divide whole numbers and decimals using efficient written methods*	Cashew nuts cost 90p for 100 grams. What is the cost of 450 grams of cashew nuts? Currants cost 40p for 100 grams. Maria pays £3 for a bag of currants. How many grams of currants does she get? Show me the calculations that you did to solve these problems. Could they be more efficient?
• Use a calculator to solve problems involving multi-step calculations *I can use a calculator to solve problems with several steps*	I want to divide a number by 8 but the '8' key on my calculator is broken. How could I do it? My calculator shows:  My question was about length. Complete this: 3.5 means 3 centimetres and … millimetres. My question was about capacity. Complete this: 3.5 means 3 litres and … millilitres. My question was about time. Complete this: 3.5 means 3 hours and … minutes.
• Use approximations, inverse operations and tests of divisibility to estimate and check results *I can estimate the result of a calculation* *I know several ways of checking answers*	What would be the best approximation to work out 2 × (8.4 + 19.7)? Give your reasons. Roughly, what answer do you expect to get? How did you arrive at that estimate? Do you expect your answer to be greater or less than your estimate? Why? This answer is wrong. How can you tell? Find two different ways to check the accuracy of this answer. Should the answer be a multiple of 5? How could you check?

Objectives *Children's learning outcomes in italic*	**Assessment for learning**
• Estimate angles, and use a protractor to measure and draw them, on their own and in shapes; calculate angles in a triangle or around a point *I can estimate angles, and use a protractor to measure and draw them* *I know that the angle sum of a triangle is 180° and the sum of angles around a point is 360°*	A pupil measured the angles in a triangle. She said: 'The angles are 30°, 60° and 100°.' Could she be correct? Give reasons. What is the angle between the hands of a clock at four o'clock? Explain how you know. There are nine equal angles around a point. What is the size of each angle? There are a number of equal angles around a point. The size of each angle is 24°. How many equal angles are there? Look at the angle.  Ring the measurement that is the approximate size of the angle. 60° 90° 110° 135° 240° Estimate the size of each of these angles. Now measure them to the nearest degree. How close was your estimate?
• Use coordinates in the first quadrant to draw, locate and complete shapes that meet given properties *I can use coordinates when the x-coordinate and the y-coordinate are both positive*	A, B and C are three corners of a rectangle. What are the coordinates of the fourth corner?  Plot (2, 3) and (5, 3). The line joining these coordinates is one side of a square. Find the coordinates of the two other vertices of the square. Find three possible answers.
• Visualise and draw on grids of different types where a shape will be after reflection, after translations, or after rotation through 90° or 180° about its centre or one of its vertices *I can reflect, rotate and translate shapes on grids*	Draw the reflection of this shape.  The shape below is rotated 90° clockwise about point A. Draw the shape in its new position on the grid. 

Objectives *Children's learning outcomes in italic*	Assessment for learning
• Select and use standard metric units of measure and convert between units using decimals to two places (e.g. change 2.75 litres to 2750 ml, or vice versa) *I can convert one measurement to another using a related unit. I use decimals to do this*	What measurement is 10 times as big as 0.01 kg? How do you know that it is 10 times 0.01 kg? I divide a measurement by 10, and then again by 10. The answer is 0.3 m. What measurement did I start with? How do you know? The height of a model car is 6 centimetres. The height of the real car is 45 times the height of the model. What is the height of the real car? Give your answer in metres. How do I write 5 metres 6 centimetres as a decimal?
• Participate in a whole-class debate using the conventions and language of debate *I can take part in a whole-class debate*	Debate with the class the usefulness of various benchmarks for estimating measurements. For example, how useful is it to know that a door is roughly 2 metres tall? What other heights can be estimated using this benchmark?

Learning overview

Children continue to **solve practical problems** involving **estimating** and measuring. For example, they suggest how to estimate the weight of one grain of rice or the thickness of one sheet of paper. When finding the thickness of one sheet of paper, they measure the thickness of 100 sheets and then divide their answer mentally by 100. They understand that the measurement found for the thickness of one sheet of paper is approximate. They **communicate** clearly how a problem was solved, explaining each step and commenting on the accuracy of their answer.

Children use **decimal notation** in the context of measures and convert between units where necessary, for example, to **solve word problems** such as:

How many 250 ml cups of tea can you pour from a tea urn that holds 8.5 litres?

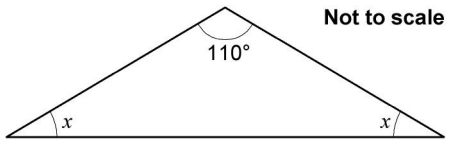
How many 30 cm square tiles would you need to buy to cover a rectangular floor which is 2.5 m wide by 3.5 m long?

There is 60 g of rice in one portion. How many portions are there in a 3 kg bag of rice?

A packet contains 1.5 kilograms of guinea pig food. Remi feeds her guinea pig 30 grams of food each day. How many days does the packet of food last?

Children **estimate angles**, and use a protractor to **measure** and **draw** angles on their own and in shapes. They know the angles of a triangle add up to 180° and that the angles around a point add up to 360°, and they use this information to calculate missing angles.

Here is an isosceles triangle.

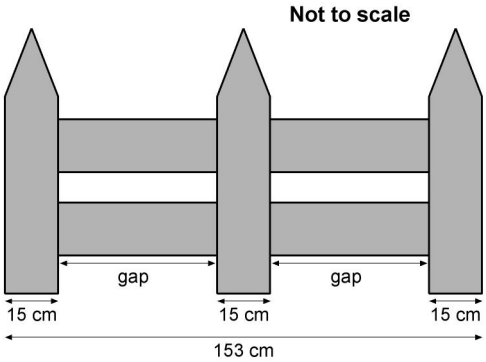


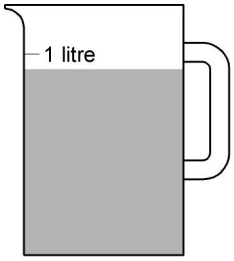
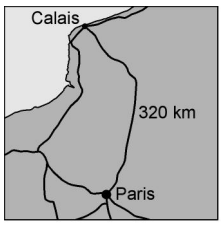
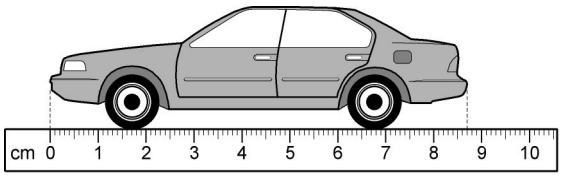
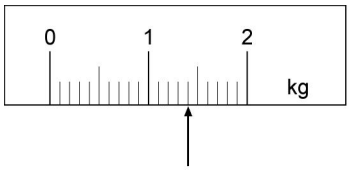
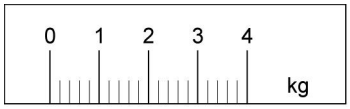
Calculate the size of angle x.
Do not use a protractor (angle measurer).

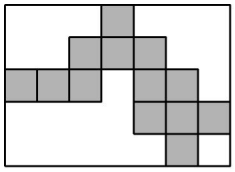
Children **read and plot coordinates** in order to **draw, complete and locate shapes**. For example, given half a shape and a line of symmetry, they complete the shape, or given three vertices of a rectangle, they establish the coordinates of the fourth vertex.

Children **predict** then check where the image of a shape will be after a reflection, rotation or translation. They use equipment (such as tracing paper) or ICT to rotate shapes through 90° and 180° about their centres or one of their vertices.

Unit 6D3 2 weeks

Objectives *Children's learning outcomes in italic*	Assessment for learning
• Solve multi-step problems, and problems involving fractions, decimals and percentages; choose and use appropriate calculation strategies at each stage, including calculator use *I can solve problems with several steps and decide how to carry out the calculation*	What clues do you look for in the wording of questions? What words mean you need to add, subtract, multiply or divide? This fence has three posts, equally spaced. **Not to scale**  Each post is 15 centimetres wide. The length of the fence is 153 centimetres. Calculate the length of one gap between two posts. Show me the calculations that you did. Did you use a written method or a calculator? Explain why.
• Calculate mentally with integers and decimals: U.t ± U.t, TU × U, TU ÷ U, U.t × U, U.t ÷ U *I can add, subtract, multiply and divide whole numbers and decimals in my head*	A packet of crisps costs 32 pence. Josh buys three packets. How much change does he get from one pound? Explain the mental calculations that you did to solve this problem.
• Use efficient written methods to add and subtract integers and decimals, to multiply and divide integers and decimals by a one-digit integer, and to multiply two-digit and three-digit integers by a two-digit integer *I can add, subtract, multiply and divide whole numbers and decimals using efficient written methods*	Make up an example of an addition/subtraction involving decimals that you would do in your head. Now make up an example you would do on paper. Explain why. Show me how to find the answer to the next problem using an efficient written method. A packet contains 1.5 kilograms of guinea pig food. Remi feeds her guinea pig 30 grams of food each day. How many days does the packet of food last?
• Use a calculator to solve problems involving multi-step calculations *I can use a calculator to solve problems with several steps*	Show me the calculator key presses you made to solve that problem. Could you do the calculation with fewer key presses? Julie is 92 cm tall. Tom is 1.34 m tall. Lisa's height is halfway between Julie's height and Tom's height. Calculate Lisa's height. Write down the calculations that you did. Show me how you used your calculator to find the answer.
• Use approximations, inverse operations and tests of divisibility to estimate and check results *I can estimate the result of a calculation* *I know several ways of checking answers*	How did you arrive at that estimate? What inverse operation could you use to check this result? Should the answer be a multiple of 3? How could you check? I added three distances. Each was an odd number and my answer was 120 km. Explain why I cannot be correct.

Objectives *Children's learning outcomes in italic*	**Assessment for learning**
• Select and use standard metric units of measure and convert between units using decimals to two places (e.g. change 2.75 litres to 2750 ml, or vice versa) *I can convert one measurement to another using a related unit. I use decimals to do this*	What might you measure in kilometres? In millimetres? Put a ring round the number which is the approximate weight of a thirty-centimetre plastic ruler. 2 g 20 g 200 g 2 kg 20 kg Look how much water is left in the jug. Estimate how many millilitres of water are left.  Explain how you arrived at your estimate.
• Solve problems by measuring, estimating and calculating; measure and calculate using imperial units still in everyday use; know their approximate metric values *I know that 1 pint is just over half a litre, and that 1 litre is about $1\frac{3}{4}$ pints* *I know that 1 mile is about 1.6 km, and that 1 km is about $\frac{5}{8}$ of a mile*	What might you measure in pints? In stones? A map shows that the distance from Calais to Paris is 320 kilometres.  5 miles is approximately 8 kilometres. Use these facts to calculate the approximate distance in miles from Calais to Paris. Explain how you worked out your answer. Did you use a calculator or a written method? What were your reasons?
• Read and interpret scales on a range of measuring instruments, recognising that the measurement made is approximate and recording results to a required degree of accuracy; compare readings on different scales, for example when using different instruments *I can read scales as accurately as a problem requires* *I can compare readings from different scales*	Here is a drawing of a model car.  What is the length of the model? Give your answer in centimetres, correct to one decimal place. On this scale, the arrow (↑) shows the weight of a pineapple.  Here is a different scale. Mark with an arrow the weight of the same pineapple. 

Objectives *Children's learning outcomes in italic*	Assessment for learning
• Calculate the perimeter and area of rectilinear shapes; estimate the area of an irregular shape by counting squares *I can find the perimeter and area of shapes and estimate the area of irregular shapes*	How would you calculate the area of this T-shape? What about this L-shape? This H-shape? Susan says: 'When you cut a piece off a shape, you reduce its area and perimeter.' Is Susan's conjecture sometimes true, always true or never true? Explain how you know. Here is a rectangle with 13 identical shaded squares inside it.  What fraction of the rectangle is shaded?
• Analyse and evaluate how speakers present points effectively through use of language, gesture, models and images *I can listen to someone explain their method or solution to a problem, and evaluate whether their explanation made sense*	Listen to and then discuss how someone explained to the class how they estimated the number of leaves of clover on the playing field. Could their method have been improved? Could their explanation have been improved? Would a table or diagram have helped?

Learning overview

Children continue to work with a range of **standard metric units**, comparing these with **imperial units still in daily use**. They suggest suitable units to measure the weight of a paperclip, the amount of milk in a tanker, the dimensions of a piece of furniture or the area of a postage stamp. They suggest suitable equipment to measure with, and the **degree of accuracy** needed when **reading scales**. They are able to **convert a measurement** to an alternative form, describing, for example, 1 litre 200 millilitres as 1200 ml or 1.2 litres.

Children continue to solve **word problems involving several steps, or involving decimals,** applying their choice of mental, written or calculator method. They make sure that measurements are converted to the same unit before calculation. They record their methods efficiently, explaining how the problem was solved. For example:

A box contains 220 matches and weighs 45 grams. The empty box weighs 12 grams. Calculate the weight of one match.

Butter costs £4.50 for 1 kg. Marie buys 200 grams of butter. How much does she pay?

Cream cheese costs £3.60 for 1 kg. Robbie buys a pot of cream cheese for 90p. How many grams of cream cheese does he buy?

Children continue to **investigate practical problems** in the context of measures. For example, they work out how many litres of water they use in a day, and compare that with the amount of water used per person 20 years ago. They solve related problems, such as:

A glass holds 225 ml. An adult needs about 1.8 litres of water each day to stay healthy. How many glasses is that?

An adult weighs 80 kg. 60% of his total mass is water. What is the mass of this water?

A jug holds 4.2 litres of water. Approximately how many jugs full of water are needed to fill a 50 litre tank?

Children continue to explore **area and perimeter of rectilinear shapes**. For example, they draw different shapes (using whole and half squares) that have an area of 12 cm^2, then find which has the longest perimeter. They predict whether a 14 cm square piece of paper or the label around a tin of

soup will have the bigger area or longer perimeter. They work out how to check and then compare the actual measurements with their prediction. They calculate the area of shapes based on rectangles: for example, the area of a path 1 metre wide around a swimming pool, given the dimensions of the pool, or the smallest area of paper needed to cover a cuboid box that is 15 cm long, 10 cm deep and 7 cm tall.

Children **estimate the size of angles** and use a protractor to **measure acute and obtuse angles**. They measure the internal angles of regular polygons and record these systematically in a table against the number of sides of the shape. They describe the **patterns and relationships** that they discover. They use facts that they know, such as the angle sum of a triangle (180°) and the sum of angles around a point (360°), to calculate angles in a triangle, on a straight line and around a point. For example, they work out how many degrees the hour hand rotates from 2 o'clock to 4 o'clock.

Children use different grids to **visualise, draw and transform shapes**, using ICT or other approaches. For example, they transform a given shape using a reflection, rotation or translation. Their partner then transforms the shape back to its original position.