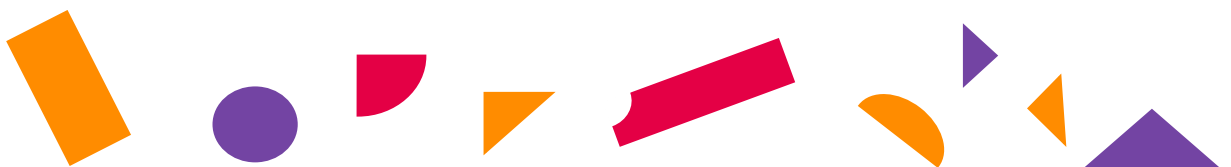


**At home materials  
Guidance Pack  
Year 4 Weeks 5-9**

<b>Week 5</b>	<b>Pack 1: Lines, length and perimeter</b> Session A) Estimating length Session B) Parallel and perpendicular Session C) Perimeter Session D) Exploring perimeter	★ ★ ★ ★
<b>Week 6</b>	<b>Pack 2: Shape and symmetry</b> Session A) Describing polygons Session B) Composing shapes Session C) Reflection symmetry Session D) Symmetry of regular polygons	★ ★ ★ ★
<b>Week 7</b>	<b>Pack 3: Triangles and Quadrilaterals</b> Session A) Creating triangles Session B) Describing triangles Session C) Creating quadrilaterals Session D) Describing quadrilaterals	★ ★ ★ ★
<b>Week 8</b>	<b>Pack 4: Time</b> Session A) Measuring time Session B) Time across a day Session C) Hour hand Session D) Minute hand	★ ★ ★ ★
<b>Week 9</b>	<b>Pack 5: Telling the time</b> Session A) Rewind to o'clock Session B) Hour hand confusion Session C) Hand mix up Session D) Telling errors	★ ★ ★ ★



**Timing**

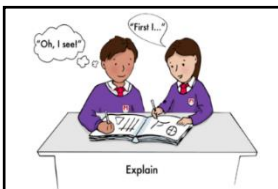
Each session is 30 minutes  
20 minute Talk Task and 10 minute independent activity

**Session guidance**

Get **them** talking and grow their language.

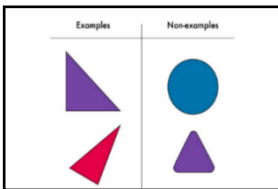
Get **them** to use equipment, manipulatives, models and images to show and explain.

Challenge them to think mathematically. Use the ‘Prompts for Thinking’ listed below to help them build habits in the way they think about mathematical situations.



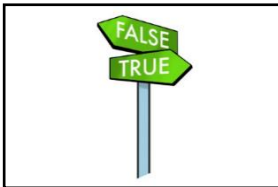
**Reason it**

Explain how you know. Focus on reasons rather than answers. What could you say, do, draw or write to help someone else understand?



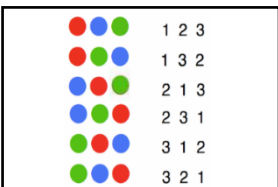
**Generate examples and non-examples**

What are the important features? What features are not important (e.g. colour)?



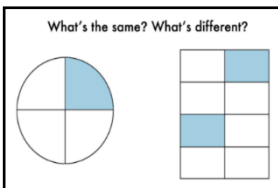
**True or false?**

If true, give examples to support your answer.  
If false, give a counter example.



**Find all possibilities**

Have you found all the possible answers? How do you know? Did you work systematically?



**What's the same? What's different?**

Compare and contrast and look for connections.  
How many different answers can you give?



**Always, sometimes or never true?**

Give examples to show if the statement is always, sometimes or never true. How do you know?

**Pack 1:** Length, lines and perimeter

**Session A:** Estimating length

**Resources needed:** String, ruler, measuring equipment e.g. measuring tape

The purpose of this session is to spend time developing a sense of length and increasing accuracy when estimating and using a variety of measuring tools.

**Talk Task**

Measuring is all about making comparisons. You use a tool, such as a ruler, to compare an object to the units marked on the scale. Before focusing on reading scales and using centimetres and metres, explore measurement language using non-standard units such as body parts. How many of your hands would be the same length as this table? Think of something that is the same length as your arm. Think of something that is shorter/taller/about the same height as you.

Focus in on standard units of measure by asking learners what they know about centimetres and metres. Ask them to estimate some lengths by using their hands or fingers. How long is 1 cm, 10 cm, 30 cm, 1 m? Use a ruler to check their measurements and allow them to adjust and feel the length before trying another length in order to increase accuracy.

Use the image of the pencil and pen to discuss how to use a ruler. The way they are lined up against the ruler prompts discussion of using zero and you should draw attention to the fact that zero is usually not right at the end of the ruler. Notice that you can still work out their lengths by reading the scale and calculating the difference. Imagine sliding the pen and pencil so they line up with zero and check that your calculations make sense.

Use your surroundings to estimate and measure a range of objects with a variety of measuring tools. Pay attention to how accurate learners are being, encouraging them to describe to you what they are doing. Work with metres, centimetres and millimetres extending into further sessions as needed.


Return to the Talk Task sheet and estimate the length of the two curved lines. Place a piece of string along the line and then measure the string to see how accurate you were. Discuss when it can be easier or harder to estimate length.

**Activity**

The activity sheet provides lines to measure. The first three are deliberately positioned to cross the width of five squares on the grid even though they are not all 5 cm long. Space is provided for learners to draw lines approximately 5 cm long and then measure them to check accuracy.

[Video guidance](#)



<b>Pack 1</b> Lines, length and perimeter	
<b>Session B:</b> Parallel and perpendicular	
<b>Resources needed:</b> Pencils or sticks	
The purpose of this session is to develop understanding of parallel and perpendicular lines.	
<p><b>Talk Task</b></p> <p>Connect to the previous session by thinking about how to compare the lengths of two pencils. Asking learners to do this will probably result in them lining the pencils up next to each other. They will make the pencils parallel to decide which is longer. Take this opportunity to point this out and talk about the word parallel.</p> <p>The sets of line segments at the top of the sheet are all the same length and yet the way they are arranged can make it seem as if they aren't. Ask learners to convince themselves that they are all the same length and to talk about what they notice. With the first pair, it can seem like the vertical line is longer. Discuss if you see this and play around with arranging pencils to see if their position changes the way you perceive their lengths.</p> <p>The first pair of lines are perpendicular: they meet at a right angle. Ask learners if they know this word then find and create examples and non-examples of perpendicular lines making connections with understanding of right angles.</p> <p>Return to thinking about parallel lines and imagine that a pencil is part of a line that continues forever in either direction. Ask learners to rotate the pencil and describe some objects that the line hits. Use a second pencil to imagine two lines continuing forever in either direction. Move the pencils and talk about when and where the lines would cross and when they would not. Attach the word parallel to situations where the lines do not cross.</p> <p>Choose an example and a non-example to focus on what is the same and what is different. Use a third pencil to explore the distance between the pairs of lines. With parallel lines, you can show that the distance never changes. Continue the discussion using the grids on the sheet. Talk about why the first pair of lines are not parallel, use the second grid to draw other lines that are parallel (or not) and extend the line segments on the final grid to support reasoning.</p>	
<p><b>Activity</b></p> <p>The activity sheet provides space to write reasons for how learners know if pairs of lines are parallel. Encourage them to demonstrate what they have understood from the session. For the second question, ask learners to label what they draw using the words parallel and perpendicular.</p>	<p><a href="#"><u>Video guidance</u></a></p> 



**Pack 1:** Lines, length and perimeter

**Session C:** Perimeter

**Resources needed:** A ruler and string

The purpose of this session is to understand perimeter as a measure of length. It is the length of the boundary of a shape.

**Talk Task**

Area and perimeter are often confused by learners because experiences can involve looking at both together. Perimeter is a measure of length whereas area is a measure of surface. In an attempt to ensure clarity on the differences, perimeter is deliberately placed within a pack on length and area is explored in later packs.

Discuss the shapes on the sheet, reviewing understanding of polygons as 2-D shapes with straight sides. Continue to work on measuring by asking learners to estimate the length of the boundary of each shape. Ask them to trace the length around the outside with their finger and decide how long this is. Write down your estimates and then work to accurately measure the perimeter.

Use a ruler to measure each straight side length and record. For any curved sides, use a piece of string and place it along the length before straightening and measuring against a ruler. Observe how learners are using the ruler and support them to decide if they use millimetres or centimetres and millimetres.

When adding together side lengths there are opportunities to discuss how to calculate and how to explain and show the steps of chosen strategies. Having measured the perimeter of different shapes, flip the activity and ask learners to use the string to mark out different shapes that have a perimeter of 20 cm. They can cut the string or tie a knot to make a loop of this length and then explore different ways of arranging it to create different shapes.

**Activity**


The activity sheet provides further practice with estimating and measuring perimeter.

Then learners sketch shapes with a given perimeter.


Encourage them to use a ruler and a piece of string to tackle this challenge.

[Video guidance](#)



<b>Pack 1:</b> Lines, length and perimeter	
<b>Session D:</b> Exploring perimeter	
<b>Resources needed:</b> Scissors	
The purpose of this session is to explore perimeter, giving lots of opportunity to find perimeter and calculate as well as notice interesting properties and investigate further.	
<b>Talk Task</b> Each of the small rectangles on the sheet measures 2 cm by 3 cm. Nine of them have been arranged in a rectangle. Explain this to learners and ask them to tell you about the lengths of the sides of this larger rectangle. Ask them to calculate the perimeter.  Explain that we are going to take away the smaller rectangles and explore what happens to the perimeter. The sheet has suggestions of shapes to look at and you should cut out the rectangles and give them to learners to play with and move around.  For the shapes you explore, sketch a small example and label with side lengths and the perimeter. There are lots of chances to calculate and you can select some examples to explore different strategies and review content of earlier packs on calculations. A number line is a useful model for showing calculations because it mirrors a ruler and you can imagine taking sections of the perimeter and laying them flat along a line.  You will be able to find lots of examples where the perimeter stays the same. Group these together and look at what is the same and what is different between them. Visualise sliding the sides out to see the original rectangle and therefore realising why the perimeter has not changed.  Find examples where the perimeter has changed and look at why these are different. You can explore how many different perimeters are possible and decide if there are any perimeter lengths that are not possible with these rectangles.	
<b>Activity</b> The activity sheet provides a starting rectangle and guides learners through a similar experience. Make sure learners realise that some of the lengths are missing and need to be worked out. Encourage them to choose where to go next and provide additional paper for them to continue to sketch and explore how to keep the perimeter the same and how to increase or decrease the perimeter.	<b><u>Video guidance</u></b> 



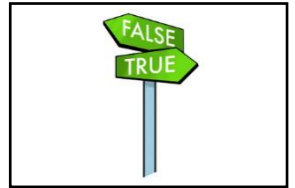
<b>Pack 2:</b> Angles and shapes	
<b>Session A:</b> Describing polygons	
<b>Resources needed:</b> Geoboard: <a href="https://mathsbot.com/manipulatives/geoboard">https://mathsbot.com/manipulatives/geoboard</a>	
<p>The purpose of this session is to create lots of different shapes and think about the different ways that we describe and label them. Examples and non-examples of polygons are explored.</p>	
<p><b>Talk Task</b></p> <p>Ask learners to use geoboards to show you what they know about 2-D shapes. Encourage them to make examples and think about the different ways to talk about the shapes. E.g. shape name, number of sides, angles, vertices.</p> <p>Let the learners take the lead in where the discussion goes. Here are some questions to guide what to find out about:</p> <ul style="list-style-type: none"> <li>• <i>Do they know the mathematical word for ‘corners’ is vertex or vertices when there is more than one?</i></li> <li>• <i>Do they know the shape names: triangle, quadrilateral, pentagon, ... ?</i></li> <li>• <i>Do they know the names of any special quadrilaterals? E.g. rectangle, parallelogram, trapezium, kite, rhombus</i></li> </ul> <p>Think about the questions and prompts you can give to find out what they can do. Encourage them to make lots of examples of the same shape to create opportunities to talk about what is the same and what is different.</p> <p>To support with the investigations on the activity sheet, talk about the angles inside some of the shapes that are made. Revise the language of acute, obtuse and right angle (using the speech bubbles) and identify examples of each within shapes.</p> <p>Towards the end of the session, focus attention on something that is similar about all of the shapes explored so far. Shapes made on the geoboard all have straight sides and three or more angles. They are polygons. At the end of the sheet are some non-examples, discuss why each one is <u>not</u> a polygon.</p>	
<p><b>Activity</b></p> <p>The activity sheet provides statements for learners to investigate if true or false. There is space provided to draw examples of the true statements. When the statement is false, encourage them to draw something that is as close as they can get. The final question is more open and can be extended to thinking of questions to investigate.</p>	<p><b><u>Video guidance</u></b></p> 



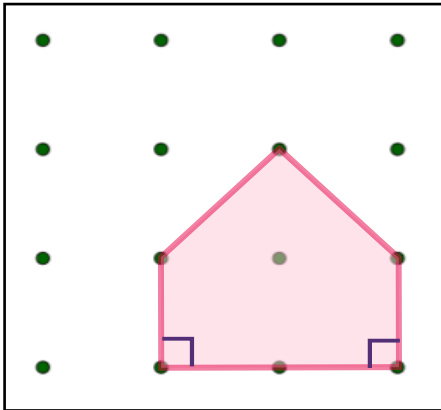


Pack 2 Session A

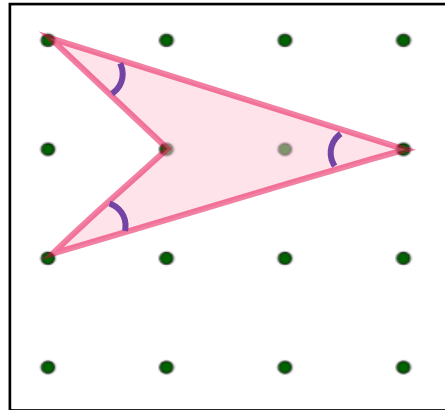
Activity: Describing polygons



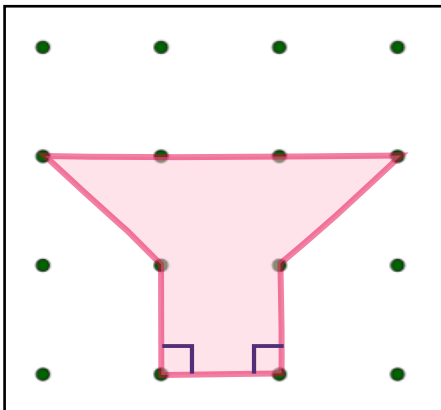
1) Is each one true or false? Show an example or if you think it is false, show how close you can get.



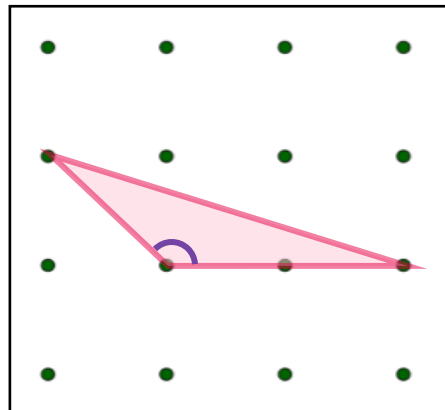
I can make a pentagon with two right angles



I can make a quadrilateral with three acute angles

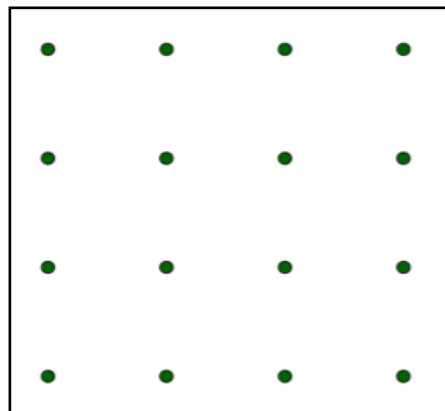
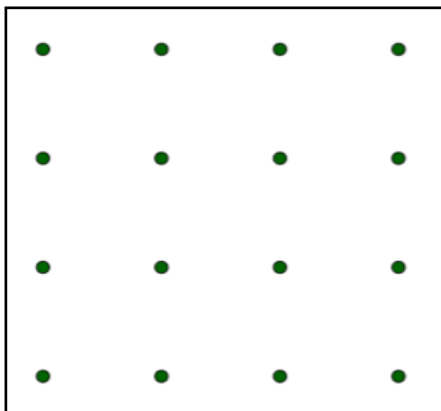


I can make a hexagon with two right angles



I can make a triangle with an acute angles

2) Write your own statements. One true and one false.





**Pack 2:** Angles and shapes

**Session B:** Composing shapes

**Resources needed:** Scissors

The purpose of this session is to make and describe lots of different shapes, with a focus on reasoning about angles within them.

**Talk Task**

Cut up the five shapes at the bottom of the page and play around with the different shapes you can make by placing these together in different ways. Talk about the shapes created using the language and properties explored in the previous session: shape names, sides, angles, vertices.

Pause and focus on the properties of each of the five shapes that are being used to build. There is a square and the two smaller triangles fit inside. Ask learners to talk about what they know about the angles within these three shapes.

*Every angle in the square is a right angle.*

*How can you convince me that these are 45 degree angles in the triangles?*

Write the value of each angle onto the shapes and use the triangles to work out the angles within the larger triangle and the parallelogram. The sheet shows how the two smaller triangles fit within them. The parallelogram has two angles that are  $90 + 45 = 135$  degrees.

Label the angles within all of the shapes and return to using the pieces to compose lots of different shapes and describe their properties.

*How many quadrilaterals can you make? How many hexagons can you make?*

Working out the angles inside each shape is an opportunity to review a range of addition strategies.

If suitable you can extend this activity by exploring the angle sum of different polygons. Noticing that adding the four angles at each vertex of a quadrilateral gives a sum of 360 or that for a triangle the sum of the three angles is always 180 and for a hexagon the sum of the six angles is always 720.

**Activity**

The activity sheet provides a pattern of squares and equilateral triangles. Learners are to visualise, identify and shade in lots of different shapes on the pattern. Space is provided below for them to write what they know about the shapes they have found.

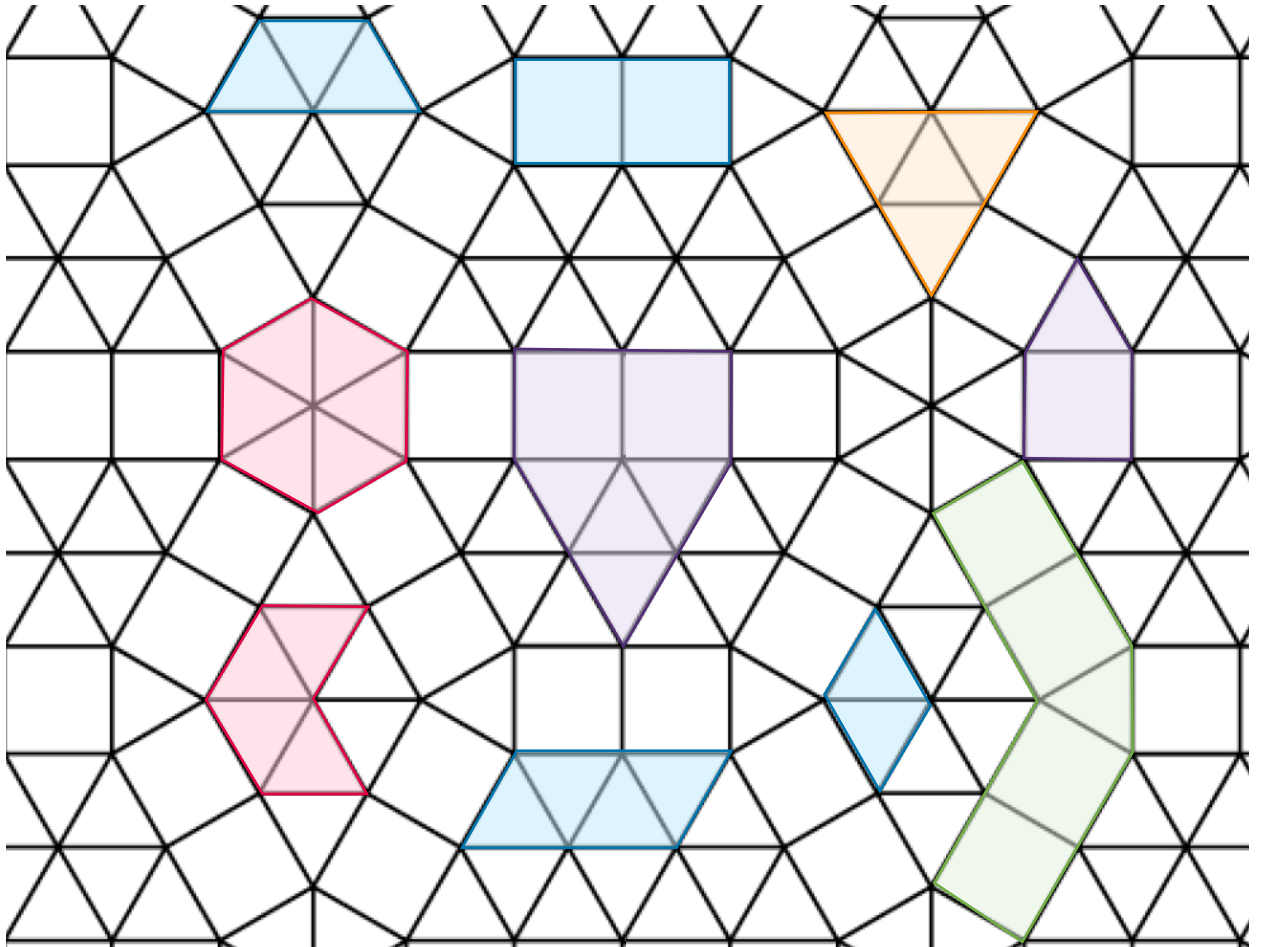
[Video guidance](#)



Pack 2 Session B

Activity: Composing shapes

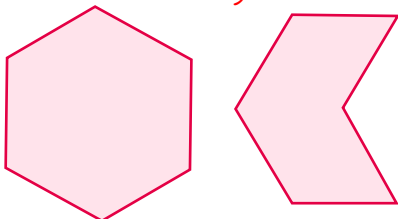
Squares and equilateral triangles have been used to make a pattern. How many different shapes can you find in the pattern? Shade some in.



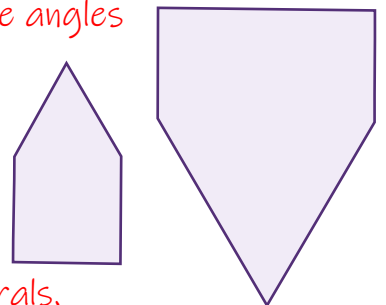
Write the names of the shapes you found.

What can you write about each shape?

Hexagons have six straight sides and six angles



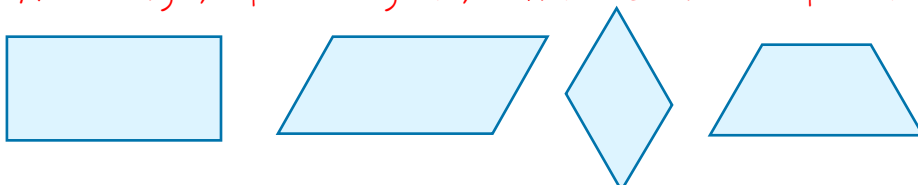
Pentagons have five straight sides and five angles




A heptagon has seven straight sides and seven angles

Polygons with four straight sides are called quadrilaterals.

A rectangle, a parallelogram, a rhombus and a trapezium are all quadrilaterals

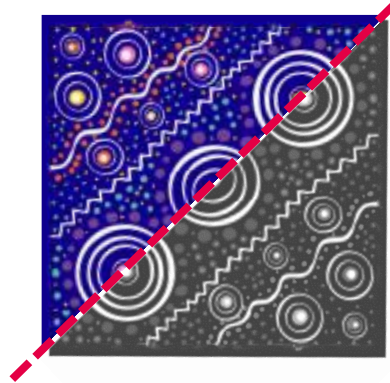
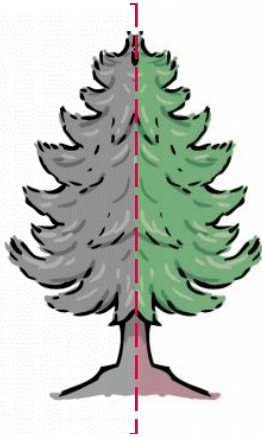


<b>Pack 2 Symmetry</b>	
<b>Session C:</b> Reflection symmetry	
<b>Resources needed:</b> Scissors, ruler, mirror (if possible), pictures of Taj Mahal	
The purpose of this session is for you to find out what learners know about symmetry and explore different ways to explain what reflection symmetry means.	
<p><b>Talk Task</b></p> <p>Experiences with symmetry in primary school focus on mirror lines and seeing how images and shapes reflect onto themselves. Examples of this type of reflection symmetry can be seen everywhere from insects and plants to the buildings we build and the symbols and logos we use.</p> <p>Ask learners to talk about their experiences with symmetry and use the items on the sheet to think about the details of what we mean when we say an image, pattern or shape is symmetrical. The human body and in particular the face is a useful place to start a discussion. The owl, the leaf and the snowflake are there to prompt thoughts about the places in nature that symmetry can be found.</p> <p>Identify lines of symmetry and think about different ways that you can explain how you know that this is a line of symmetry. This could include showing that everything is on one side is also on the other and folding or using a mirror to see how one half reflects exactly onto the other half.</p> <p>The picture of a building is a drawing of the Taj Mahal complex in India. This building and the surrounding gardens are rich in symmetry. The angle of the drawing stops you folding and lining up; however, you can see the symmetry in the gardens and the building. Use the internet to find other images and discuss the line of symmetry that can be seen. Extend the discussion by thinking of other buildings that learners know that have reflection symmetry. Extend further by thinking of other examples of symmetry in the world around us.</p> <p>Cut up the tiles at the end of the page and play around with creating examples and non-examples of patterns with line symmetry. Identify lines of symmetry encouraging learners to explain how they know. What is the greatest number of lines of symmetry you can find in a pattern you create?</p>	
<p><b>Activity</b></p> <p>The activity sheet provides experiences with completing symmetrical images and identifying lines of symmetry, then creating patterns with different lines of symmetry by shading in squares on a grid. You can provide squared paper for learners to explore further.</p>	<p><a href="#"><u>Video guidance</u></a></p> 



**Activity:** Reflection symmetry

1) Complete the other side of the symmetrical images.



2) Draw on the lines of symmetry onto these flags. Ignore the colours.



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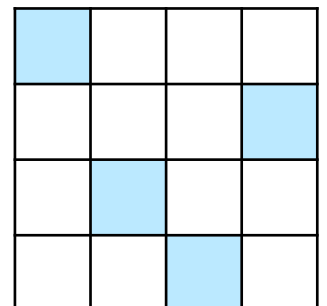
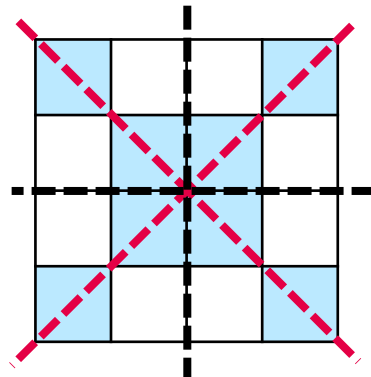
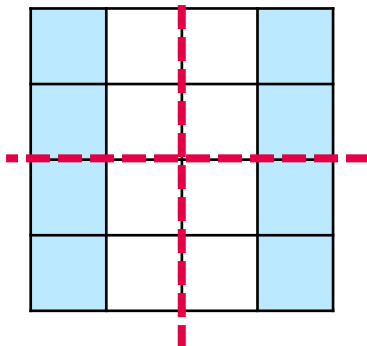
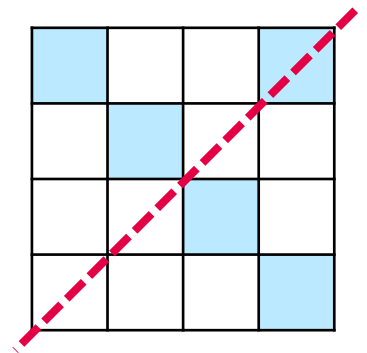
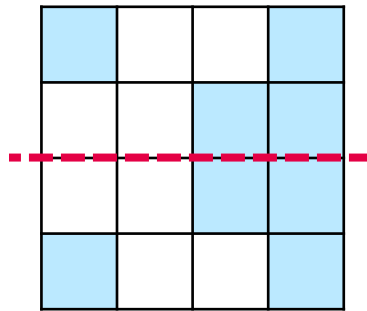
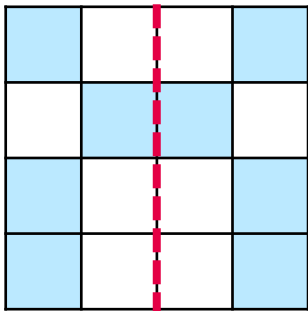
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3) Shade in parts of the grids to make patterns with given lines of symmetry.

There is more than one way to complete these.



Notice any extra lines of symmetry in the patterns – some here shown in black

**Pack 2:** Symmetry

**Session D:** Symmetry of regular polygons

**Resources needed:** Scissors, ruler, tracing paper

The purpose of this session is to use reflection symmetry to identify that each shape has sides of the same length and angles of the same size and use the words regular and irregular to describe polygons

**Talk Task**

Use two copies of the Talk Task sheet and cut out the shapes on one of them. Review the meaning of the word polygon (a shape with three or more straight sides). Take the time to explain why the shapes on the sheet are polygons and discuss and explore the symmetry these shapes have.

Focus on reflection symmetry, noticing when the lines of symmetry are already marked on the shape. Use these to discuss if the statement at the top of the sheet is true or false. The lines of symmetry already marked all pass through a vertex, however for most of the shapes there are more lines of symmetry.

Returning to this after the activity allows you to notice that the regular polygons with all lines of symmetry passing through a vertex have an odd number of sides.

You may wish to explore rotation symmetry by holding the cut-out shape in place with a pencil at the centre mark and rotating. This is not necessary but interesting to compare with reflection symmetry. To describe how many times the shape fits onto itself when rotating you say its order of rotational symmetry.

*The triangle has rotational symmetry of order 3.*

*The square has rotational symmetry of order 4.*

Throughout the discussion, draw attention to what the symmetry tells you about the properties of the shape. *How can you convince me that every side is the same length and every angle is the same size?* These shapes are called regular. Sketch some irregular examples of each polygon.

Notice the connection between the number of sides and the number of lines of symmetry for each. Is it the same for all regular polygons? This is continued in the activity.

**Activity**

The activity sheet provides a table for learners to complete with the name of each regular polygon and information about symmetry. Write in the information for the shapes explored in the Talk Task and cut out the shapes to fold and explore in order to complete the table.

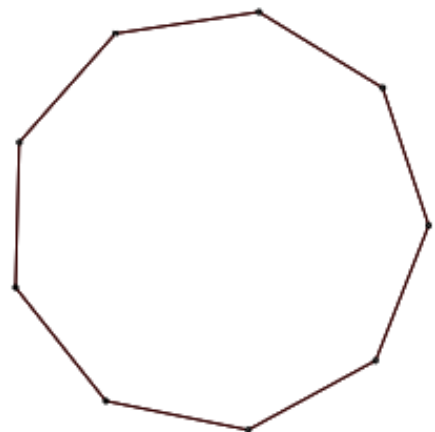
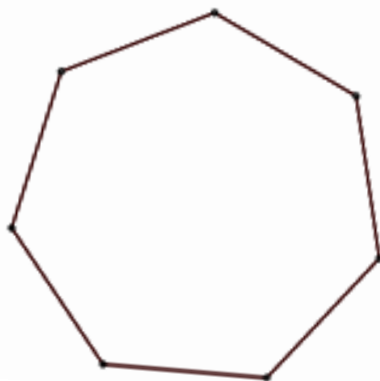
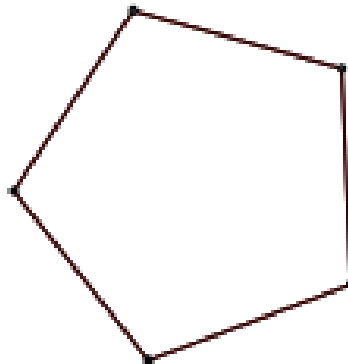
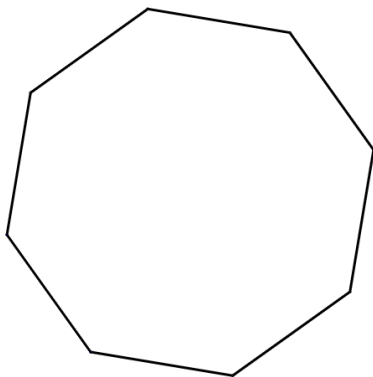
[Video guidance](#)




**Activity:** Symmetry of regular polygons

Complete the table with information about each regular polygon. Cut out, fold and rotate the shapes to check the pattern is correct.

Regular polygon	Number of sides	Number of lines of symmetry	Rotational symmetry of order ...
Triangle	<b>3</b>	<b>3</b>	<b>3</b>
Quadrilateral (square)	<b>4</b>	<b>4</b>	<b>4</b>
Pentagon	<b>5</b>	<b>5</b>	<b>5</b>
Hexagon	<b>6</b>	<b>6</b>	<b>6</b>
Heptagon	<b>7</b>	<b>7</b>	<b>7</b>
Octagon	<b>8</b>	<b>8</b>	<b>8</b>
Nonagon	<b>9</b>	<b>9</b>	<b>9</b>
Decagon	<b>10</b>	<b>10</b>	<b>10</b>



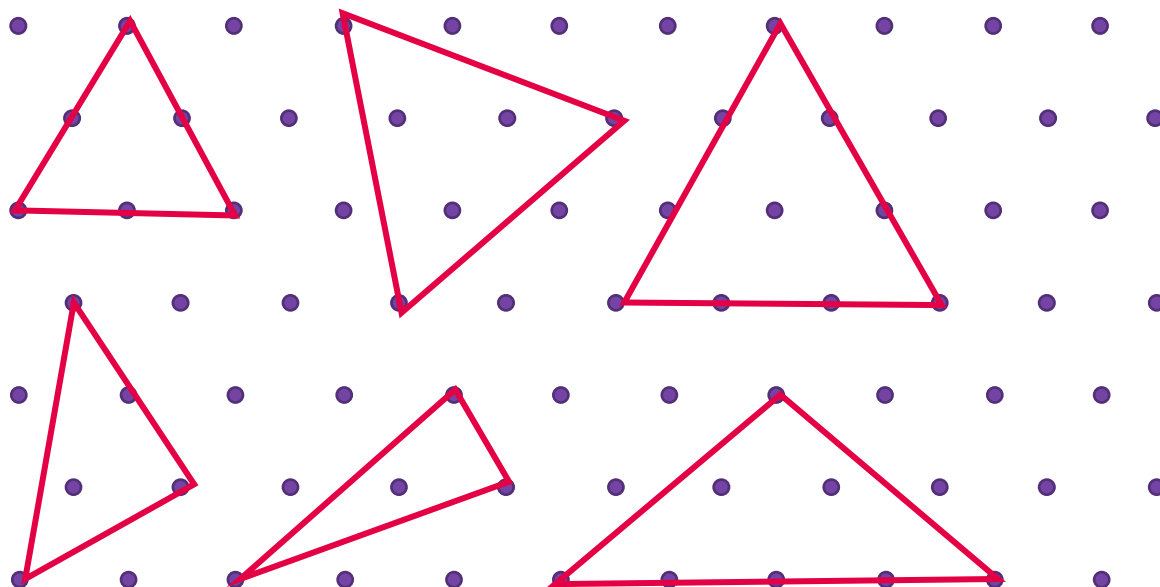
<b>Pack 3:</b> Triangles	
<b>Session A:</b> Creating triangles	
<b>Resources needed:</b> Ruler, large pieces of paper, scissors	
The purpose of this session is to create and describe the properties of lots of different triangles using a variety of language.	
<p><b>Talk Task</b></p> <p>Introduce triangles by asking learners to think about the statement at the top of the sheet. Try out lots of examples to decide if it is sometimes, always or never true. Use this as an opportunity to focus on the skill of using a ruler to accurately draw straight lines. Pay attention to how the ruler is being positioned and held and work with learners to find a position that allows them to be accurate.</p> <p>Provide large sheets of paper and longer rulers and encourage lots of different triangles to be created. By thinking about the different ways to arrange three dots, learners might realise that if all of the dots are in line then a triangle will not be made and instead a straight line is formed. Therefore the statement is sometimes true.</p> <p>Use the triangles created and the ones on the sheet to discuss the properties of triangles and any words that learners have prior experience with e.g. <i>sides, vertices, angles,...</i> There are some non-examples on the sheet to discuss why they are not triangles. Triangles have three straight sides. The three sides meet to make three angles. Talk about the angles within the different triangles and identify them as acute, obtuse or right angles.</p> <p>Extend the experience with a ruler by measuring some of the side lengths of some of the triangles. Ask learners to describe and compare the side lengths. E.g. <i>The same length, nearly the same length, one short and two long, ...</i></p> <p>If they have not come up in discussion, introduce the words, equilateral, isosceles and scalene and talk about what they mean, finding examples of each.</p> <p>Equilateral triangle – all sides are equal length, all angles are equal size          Isosceles triangle – two side are equal length, two angles are equal size          Scalene triangle – no sides are equal length, no angles are equal size</p>	
<p><b>Activity</b></p> <p>The activity sheet provide a grid of dots for learners to create different triangles. Then they describe angle within triangles and you can prompt them to write down other properties such as symmetry. Extend the activity by practising using a protractor to measure some of the angle within triangles.</p>	<p><a href="#"><u>Video guidance</u></a></p> 



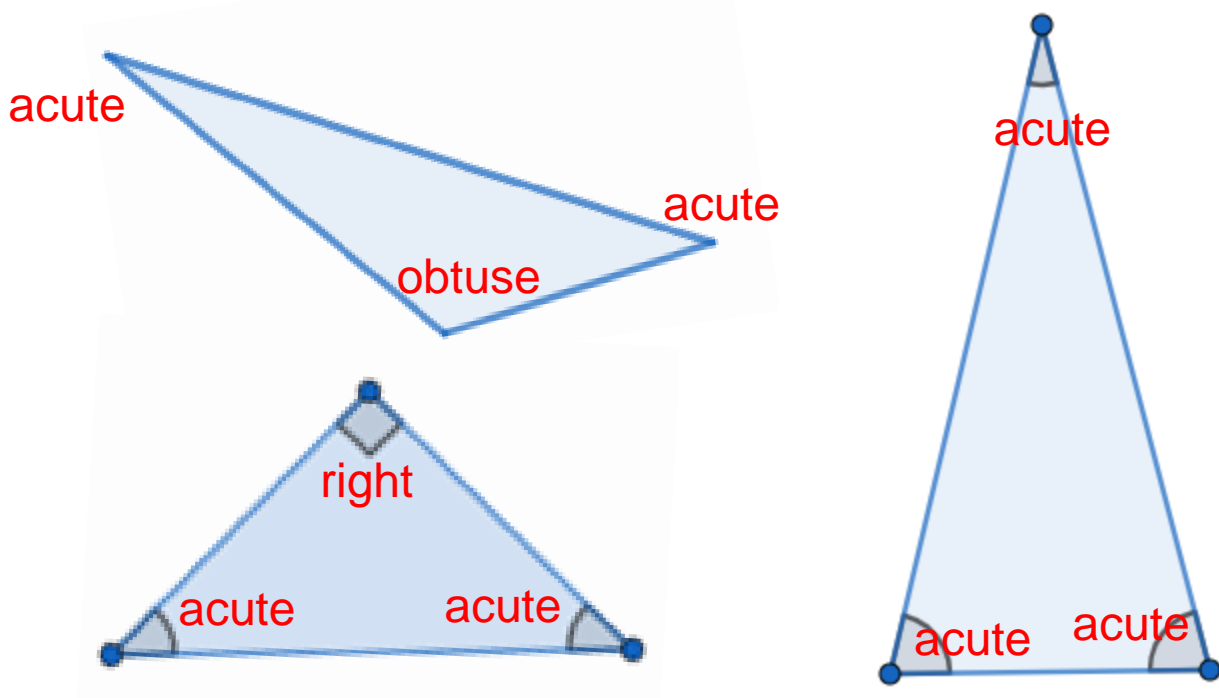



**Activity:** Creating triangles

- 1) Use a ruler to join dots to create triangles. How many different ones can you make?



- 2) Describe the angles as acute, obtuse or right angle.

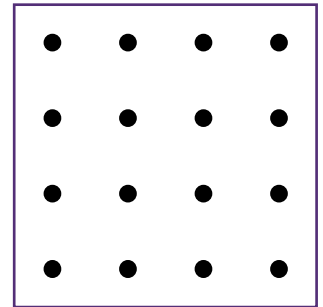
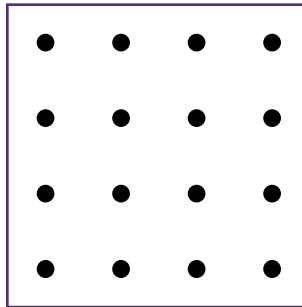
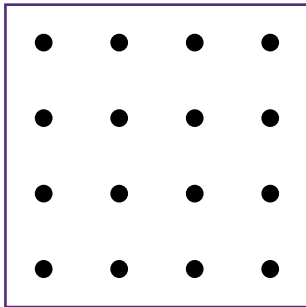


<b>Pack 3:</b> Triangles	
<b>Session B:</b> Describing triangles	
<b>Resources needed:</b> Geoboards	
The purpose of this session is to create, describe and classify triangles using a variety of language.	
<p><b>Talk Task</b></p> <p>Challenge learners to use geoboards to create as many different triangles as they can. There are often two sides to a geoboard, one with pegs arranged in a square grid and another with pegs arranged in triangles. Different triangles can be made on each side and both should be explored. The sheet provides some examples to discuss or recreate and uses the triangular side because it is possible to make equilateral triangles. Across the session, prompt learners to think about why it is hard to make an equilateral triangle on a square grid.</p> <p>Ask learners to describe the properties of the triangles as they create them. By this session, they have experience with a range of language and properties and you should take the time to ensure learners use the vocabulary lots. Build on the previous session and identify triangles that are isosceles and those that are equilateral. Discuss the word we use to describe triangles that are neither (scalene) and identify lots of examples of these.</p> <p>Create a triangle that is identical to one already made but in a different orientation and ask learners to decide if this is a different triangle. Challenge them to create a triangle in a different orientation thinking about how to make sure it is the same. These experiences link to future learning on transformations such as reflection and rotation.</p> <p>Focus on angles within triangles, reviewing the language acute, obtuse and right angles. Find examples of triangles that have right angles and talk about why an equilateral triangle cannot have a right angle. The shapes at the bottom of the sheet can help with this. The regular hexagon is made up of six equilateral triangles that meet to make a full turn of <math>360^\circ</math>. This can be used to identify that the equilateral triangles have <math>60^\circ</math> angles. The square shows that two right angles will not meet to make a third angle. Work out the angles of the triangles within.</p>	
<p><b>Activity</b></p> <p>The activity sheet provides dots grids for learners to create different triangles and classify them. Encourage learners to mark on any other properties they can identify. Then learners complete a two-way grid, drawing triangles into each section to demonstrate their understanding of types of triangles.</p>	<p><a href="#">Video guidance</a></p> 

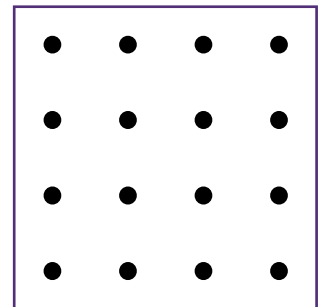
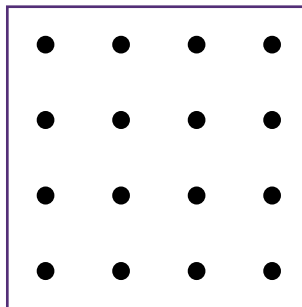
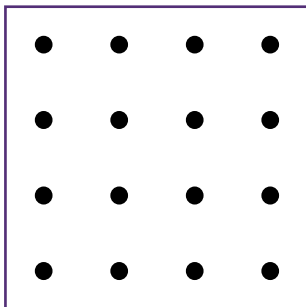


**Activity:** Describing triangles


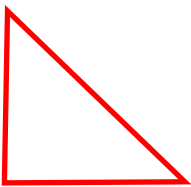
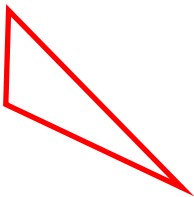
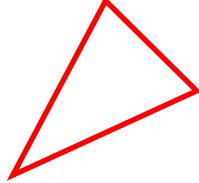
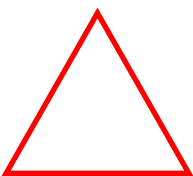
- 1) Join dots to make different triangles. Write isosceles or scalene to describe each triangle.



Check that triangles are labelled correctly.  
Check that each is a different triangle.



- 2) Try to draw a triangle for each section of the table.

	Scalene	Isosceles	Equilateral
Has a right angle			Not possible
No right angle			

**Pack 3:** Quadrilaterals

**Session C:** Creating quadrilaterals

**Resources needed:** Scissors, paper to sketch shapes on

The purpose of this session is to use triangles to create a range of quadrilaterals and describe their properties using a variety of language.

**Talk Task**

Cut up the two equilateral triangles and use symmetry to convince yourselves that they are equilateral triangles. Fold along lines of symmetry and rotate one triangle on top of the other to show equal angles and sides.

Cut each triangle along the dotted line and talk about the properties of the triangles you now have. Challenge learners to move the triangles around to create as many different shapes as they can. Make sketches of the shapes, naming them and describing their properties.

Focus attention on examples that have four sides and discuss the word quadrilateral. A quadrilateral is a polygon with four straight sides and four angles. Connect to other words with 'qua' or 'quad' that have a connection with four. A quad bike has *four* wheels, a quarter is one of *four* equal parts.

Take the time to find out which special quadrilaterals learners know the names of and what properties they can identify about these shapes. The Talk Task in session D has descriptions that you can use to support you in finding out how familiar learners are with these shapes.

- Side lengths - when they are all equal, when there are pairs of equal sides
- Parallel or perpendicular sides
- Angle size. For angle size you can write on the angles for each triangle linking to knowledge of equilateral triangles to identify them as 60, 90 and 30. This can deepen discussions of angles beyond saying if they are acute, obtuse or right angles.
- Symmetrical properties are the focus of a later session (it might be tricky to discuss here as the shapes are in bits)

Repeat the experience with the rectangle.

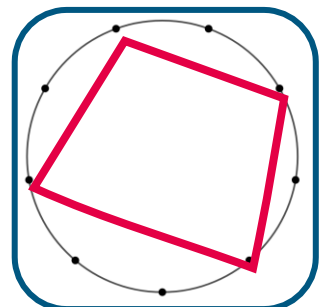
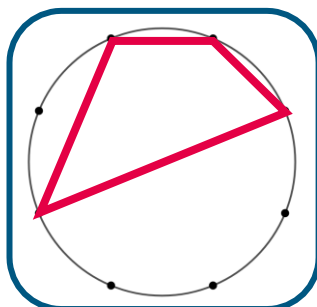
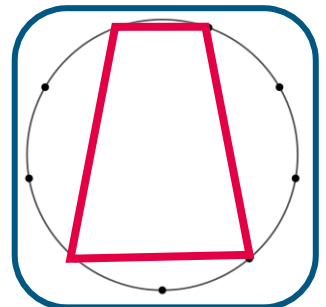
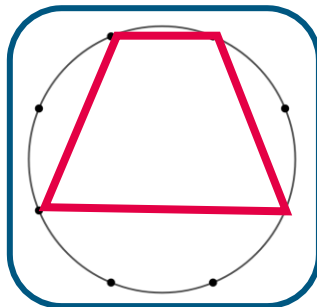
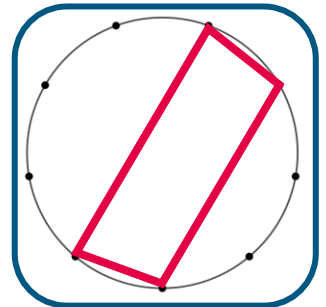
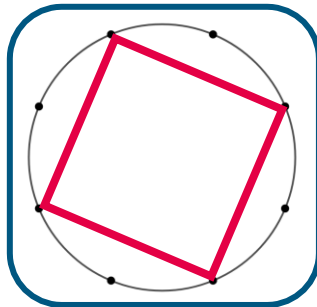
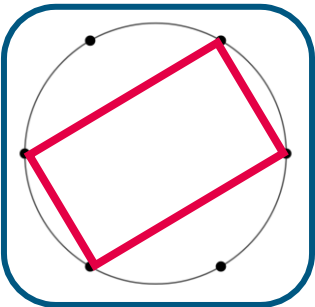
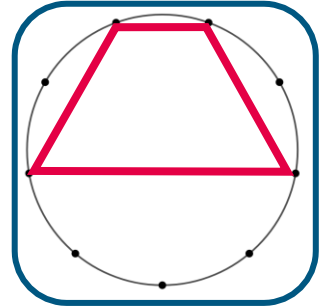
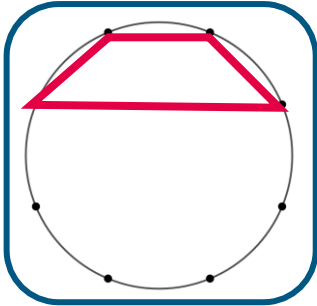
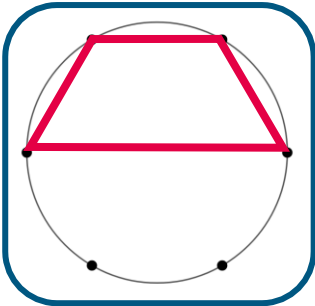
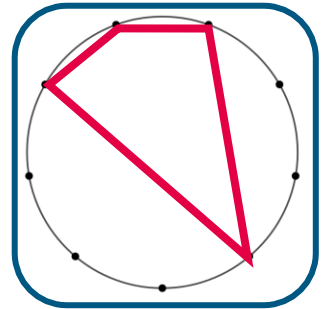
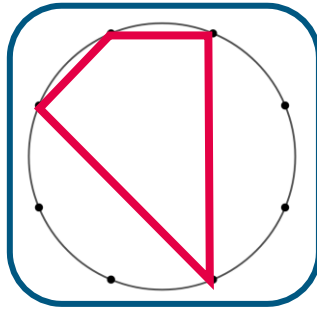
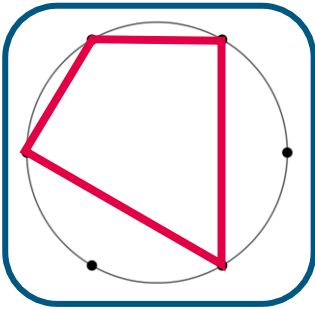
**Activity**


The activity sheet provides circles with equally spaced dots for learners to join and create different quadrilaterals. Encourage them to name as many as they can and record properties they can identify. Explore how the different number of dots can change which quadrilaterals you can make.

**Video guidance**




Activity: Creating quadrilaterals



<b>Pack 3:</b> Quadrilaterals	
<b>Session D:</b> Describing quadrilaterals	
<b>Resources needed:</b> Ruler	
The purpose of this session is to bring together the sessions in this pack by describing and defining special quadrilaterals, noticing connections.	
<p><b>Talk Task</b></p> <p>The names we use to label special quadrilaterals do not reveal the connections between them. For example, a square is a rectangle. It is a rectangle that has equal length sides. We give a different name to this group of rectangles.</p> <p>There are lots of other examples of this and discussing definitions provides great opportunities for learners to think about the importance of precise language.</p> <p>Read the short description of a rectangle and use this to discuss the least amount of information that is needed to define a special quadrilateral. Identify other properties of a rectangle that could be included in a description (opposite sides are parallel, opposite sides are equal, two lines of symmetry, rotation symmetry of order two) and talk about if you need any of that. Do you even need to know if there are four right angles? Is it enough to know that there are three?</p> <p>Read the other descriptions, sketching a few examples of each and identifying other properties that could be included in the description. Language to clarify: equilateral, like with triangle, means equal sides; adjacent means 'next to'.</p> <p>Discuss if the speech bubble statements are always true, sometimes true or never true, thinking about what information you need to help you decide.</p> <ul style="list-style-type: none"> <li>• As already discussed above, a square is a rectangle.</li> <li>• A square has two pairs of parallel sides and equal opposite angles and so it is a parallelogram. It is a parallelogram with right angles and equal sides.</li> <li>• A rhombus is an equilateral parallelogram. A square is a rhombus. It is a rhombus with all angles equal.</li> <li>• As above, a rectangle (square) is always a parallelogram. This statement is sometimes true because a parallelogram is not always a rectangle.</li> </ul>	
<p><b>Activity</b></p> <p>The activity sheet provides space for learners to return to the activity in session A, building quadrilaterals with triangles. This time there is more choice as they are using dots on circles as their options. Encourage them to explore options and record information about the shapes they create.</p>	<p><a href="#">Video guidance</a></p> 



<b>Pack 4:</b> Time	
<b>Session A:</b> Measuring time	
<b>Resources needed:</b> Tools for measuring time: clocks, stopwatch, sand timer,...	
The purpose of this session is to find out how familiar learners are with different units of time and the tools used to measure time.	
<p><b>Talk Task</b></p> <p>Discuss the units of time shown on the sheet, talking about when each of these units might be used thinking of examples from life. Decide the order from smallest to largest and describing the relationships between different units. Some points to include:</p> <ul style="list-style-type: none"> <li>• 60 seconds is a minute, 60 minutes is an hour, 24 hours is a day, 7 days is a week</li> <li>• A day is the amount of time it takes the earth to make one turn on its axis</li> <li>• A month is not a set number of days and can range from 28 to 31 days</li> <li>• A year is the amount of time it takes the earth to travel around the sun</li> <li>• There are 52 weeks in a year</li> <li>• 365 days in a year unless it is a leap year and 29<sup>th</sup> February is an extra day</li> </ul> <p>Knowing where words come from can support with understanding. For example:</p> <ul style="list-style-type: none"> <li>• ‘Dec’ means 10, ‘cent’ means 100, and ‘mille’ means 1000 in Latin</li> <li>• Fortnight is Old English for fourteen nights</li> </ul> <p>Extend the discussion by talking about other units of time that they might experience in their lives. For example, the school year is not a full year. It is made up of three terms. <i>How long is half a term?</i> (5 to 8 weeks) <i>How long is half term?</i> (a week off school)</p> <p>Next think about ways that time is measured. Use the images to discuss what learners know about tools and devices (recent and historical) for measuring time. <i>Do they have a watch? Is a stopwatch the same as a clock? Have they heard of candle clocks or water clocks? Can they think about how water or a burning candle could be used to mark the passing of time?</i></p> <p>Think about other measuring tools they have used and think about what is the same and what is different between these. Highlight the scales you can see on the tools and discuss different units the tools use.</p>	
<p><b>Activity</b></p> <p>The activity sheet prompts learners to think about how units of time are used. They must select a suitable unit and then consider something that would be measured in a given unit. The true or false question challenges learners to compare units of time.</p>	<p><b>Video guidance</b></p> 





Pack 4 Session A  
**Activity:** Measuring time

*Answers*

1) Which unit of measure would you use to describe each of the following

a) Age of an adult      Years

b) Age of a baby      Months

c) Length of a film      Minutes

2) Choose something that you would measure with each of these units:

a) Hours

b) Weeks      **Check answers  
are suitable**

c) Seconds

3) Decide if each statement is true or false.

a) The half term break is longer than 4 days.      ~~True~~ False

b) 15 days is shorter than a fortnight.      True ~~False~~


c) The summer holidays are longer than 3 weeks      ~~True~~ False

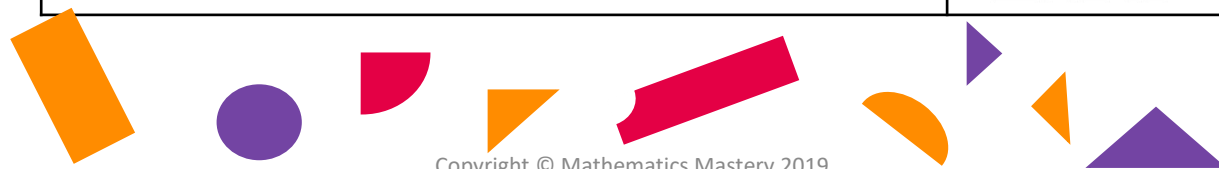
d) Half a year is shorter than a school term      True ~~False~~

Write a true statement and a false statement:

**Check answers are suitable**



<b>Pack 4:</b> Time	
<b>Session B:</b> Time across a day	
<b>Resources needed:</b> Geared clock / online teaching clock <a href="https://mathsframe.co.uk/en/resources/resource/406/ITP-Clock">https://mathsframe.co.uk/en/resources/resource/406/ITP-Clock</a>	
The purpose of this session is to provide an experience of watching a clockface for a whole day and looking at how the hands move as time passes.	
<p><b>Talk Task</b></p> <p>A geared clock is a useful tool because changing from one time to the next involves winding the hands through time rather than separately changing their positions.</p> <p>Use the visual description of a day in the life provided on the sheet to talk through the person's day. This a chance to explore the different ways to say the time as you talk through the events of the day. For example, they woke up at <i>six thirty</i> and travelled to work at <i>half past seven</i>.</p> <p>Use the clock alongside to start at midnight and wind the hands through time counting the hours. Pause at each event in the description of a day and notice the position of the hour hand and the minute hand. The details of how the clock works and how to read it will be the focus of later sessions and so most of the times chosen are on the hour or half past as these are easily recognised on a clock face. Encourage learners to watch the clock hands move and pay attention to how much more the minute hand moves compared to the hour hand. Thinking and talking about the length of time between events brings this into focus and strengthens understanding that 60 minutes is one hour.</p> <p>Give learners time to think about a day in their life and what events they would choose to record. Encourage them to use a clock and wind the hands through time, talking about events that happen on a 'normal' day. You may need to pick a particular day, e.g. yesterday.</p> <p>Discuss the similarities and differences with the example on the sheet. <i>Do they get up earlier or later? Do they eat lunch at a different time?</i></p> <p>These conversations should lead into the activity and get them ready to record.</p>	
<p><b>Activity</b></p> <p>The activity sheet provides space for the learners to record the details of a day in their life. Provide a clock for them to wind as they think through and write down the time of each event. Encourage learners to sketch images of the clockface for each part of their day.</p>	<p><b>Video guidance</b></p> 




Pack 4 Session B

**Activity:** Time across a day

*Answers*

Activities from across a day recorded with an arrow pointing to when they happen

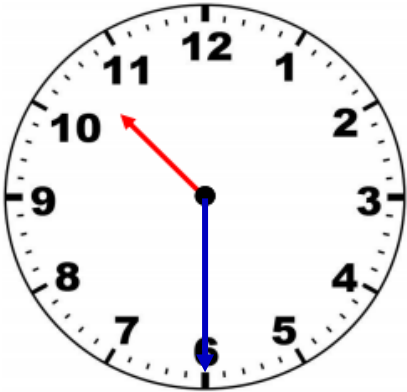
The times should be made with a clock and these can be sketched on the sheet or the time written in words or numbers.

<b>Pack 4:</b> Time	
<b>Session C:</b> Hour hand	
<b>Resources needed:</b> Geared clock / online teaching clock	
The purpose of this session is to highlight that a clock has two scales, the hours and the minutes, and to focus on reading the hour hand only.	
<p><b>Talk Task</b></p> <p>Reading a clock face is complicated. There are two hands pointing to two different scales. This session identifies this and then focuses on the hour hand and reading the hour scale with the next session focusing on the minute hand.</p> <p>Look at a clock and talk about what the numbers mean. Some clocks, including teaching clocks show the minutes as well as the hours. Highlight that the same position means different things depending on which hand is pointing to it.</p> <p>Focus on the curved scales around the edge of the clockface by turning them into straight number lines. Stick a strip of paper around the outside of the clock and mark off the intervals. Take off the strip of paper and lay it flat to see that the scale around the outside of a clock can be thought in the same way as a number line or a ruler.</p> <p>Repeat this to create two scales labelled with minutes and hours as shown on the sheet. Ask learners to think about how these scales fit together and to explain the third image on the sheet. 60 minutes is one hour and so the minute scale fits within each interval of the hour scale. As the hour hands moves one interval, the minute hand makes a full turn.</p> <p>The fact that a clockface has two scales is one of the reasons it can be difficult to understand. Explain that we are going to think about each one in turn, starting with the hours. Ask learners if they think they would be able to read the time if only the hour hand was shown. Images are provided on the sheet to guide this discussion. Building on the previous session where they wound a geared clock through time, focus on the movement of the hour hand between each interval on the clock. By exploring lots examples, conclude that from the position of the hand, you can tell the time with some accuracy. This discussion should highlight the need for a minute hand in order to be more accurate in reading the time.</p>	
<p><b>Activity</b></p> <p>The activity sheet provides further tasks involving only the hour hand. Learners select the correct time shown by the hour hand and then draw the position of the hour hand for a given time. Extend the task by challenging them to draw on the minute hand as this will be the focus of the next session.</p>	<p><b>Video guidance</b></p> 



**Activity:** Hour hand

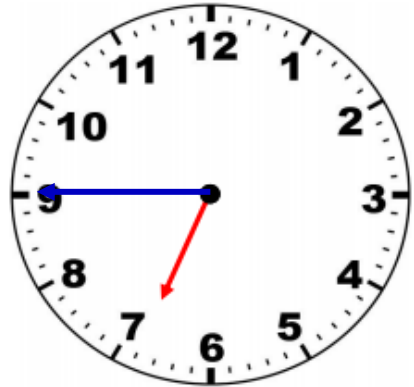
1) Select the correct time. Where would the minute hand be?



Quarter past 10

**Half past 10**

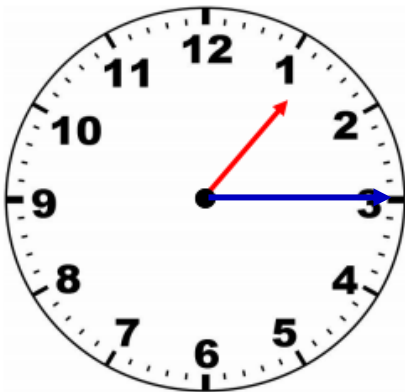
Quarter to 11



7 o'clock

Quarter past 7

**Quarter to 7**



**Quarter past 1**

Half past 1

Quarter to 2



2:10

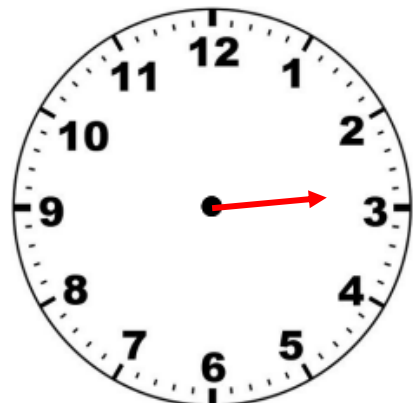
**2:40**

2:55


2) Choose where to draw the hour hand to show the given time.



Half past 8

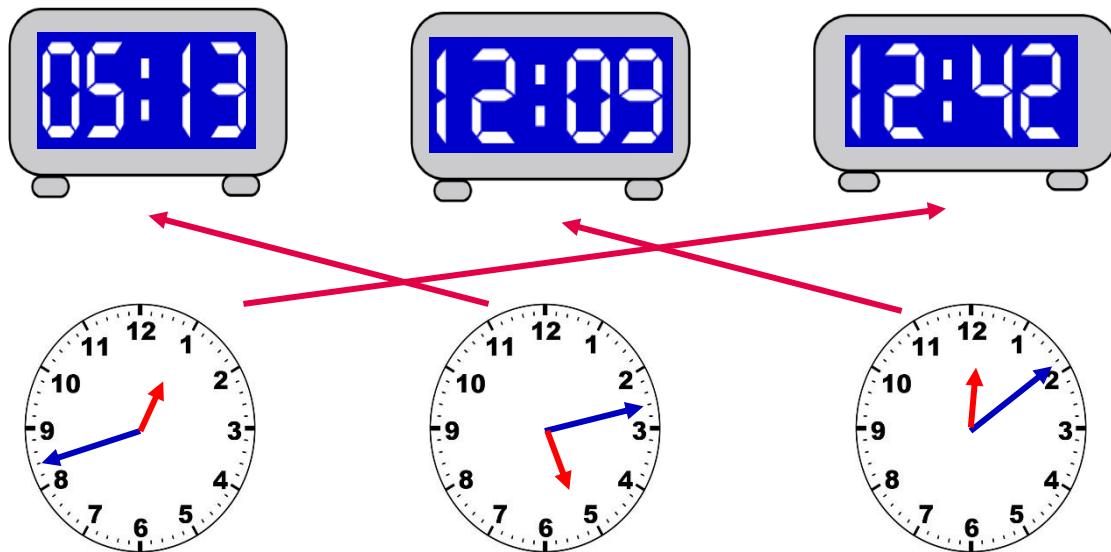


Ten to three

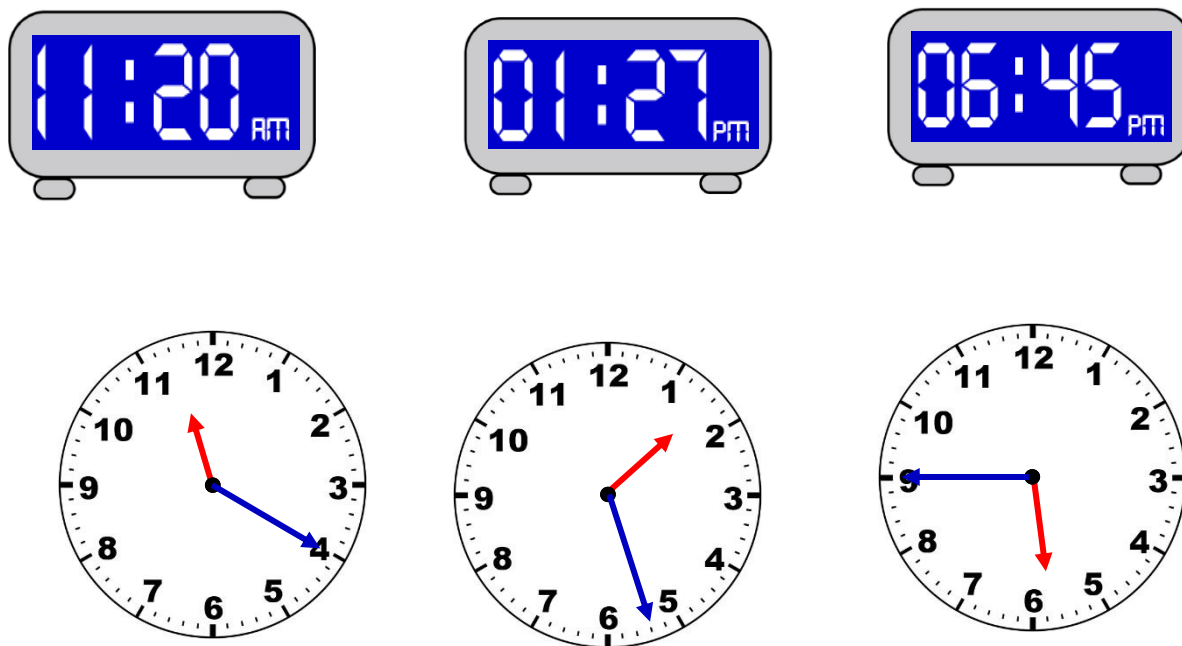
<b>Pack 4:</b> Time	
<b>Session D:</b> Minute hand	
<b>Resources needed:</b> Geared clock / online teaching clock	
The purpose of this session is to focus on the minute hand, exploring the language available to describe its position	
<p><b>Talk Task</b></p> <p>Review the previous session that highlighted the two different scales on a clockface and that each hand gives different information. The hour hand was the focus of the previous session and now we shift attention to the minute hand.</p> <p>Use a clock to wind the minute hand through an hour and discuss the different language used to say the time. Write down some key words and phrases.</p> <p>A few clocks are shown on the sheet to prompt discussion. Talk about when we choose to say <b>'past</b> the hour' and when we choose to say <b>'to</b> the hour'. It is interesting to think about the fact that you can say both at any time. 'Ten past three' is also 'fifty to four' but we don't tend to say that. Explore other examples of saying the time both ways. Conclude that we say 'past' for time up to half past and after that we say how long to the next hour.</p> <p>Talk about the fraction language quarter and half and when we use them for time. We could also say 'a third past seven' when it is 7:20 or 'a third to nine' when it is 8:40 but we don't. Challenge learners to think of other examples and to play with the language.</p> <p>The minutes can also be read as just the number as this is often the way a digital clock display is read. The hour first then the number of minutes. Four fifteen.</p> <p>In the previous session the hour hand alone was used to tell the time. Discuss if it is possible to tell the time with only the minute hand. It is possible to tell something about the time, but not what hour of the day it is and so conclude that it is not possible.</p> <p>Use the clocks at the end of the sheet to get learners to explain why the minute hand is in the correct place to match the time shown on the digital clock and how they know. Challenge them to draw the hour hand onto each.</p>	
<p><b>Activity</b></p> <p>The activity sheet has digital clocks to be matched to clocks with only a minute hand. The hour hand can then be drawn in to show the time. Then the task is reversed so that the hour hand is provided and the minute hand needs to be drawn in to match times on a digital clocks.</p>	<p><b>Video guidance</b></p> 




1) Match the clocks and draw in the hour hand.



2) Draw the minute hand in the correct position to show each time.





<b>Pack 5:</b> Telling the time	
<b>Session A:</b> Rewind to o'clock	
<b>Resources needed:</b> Geared clock / online teaching clock	
<p>The purpose of this session is to read the time on a clock using the strategy of rewinding to o'clock and following the hands round from there to make sense of the position of the hands and accurately read the time.</p>	
<p><b>Talk Task</b></p> <p>The previous time pack looked at each hand in turn highlighting that a clock has two scales with each hand pointing to a different one. This session brings the hands together pulling together lots of different elements that have been looked at in turn.</p> <p>It is worth spending some time thinking about the difference in the lengths of the hands. The minute hand is longer. Often it goes through the numbers showing the hours. This is because those numbers are not for the minute hand.</p> <p>A useful strategy when trying to make sense of the information on the clockface is to use easily recognisable times, such as o'clock, as a benchmark and working from there to work out the time.</p> <p>Using a geared clock, show a time and discuss how to work out what time is shown. Rewind time to the o'clock position and count through the minutes until you get back to the shown time.</p> <p>Repeat with lots of examples exploring different ways to count through the minutes, in fives, in tens, skipping forward to half past then count on in fives or one. Or even by fast forwarding time to the next hour and working backwards from there. Use the digital clock display to show the time on a clock by starting at o'clock and moving from there.</p> <p>By exploring telling the time like this, you are exposing learners to lots of different times and there are also lots of opportunities to say the time in different ways and explore the language options. To simplify the process you can focus on writing time in numbers and say the time by reading the numbers, leaving the alternative language structures (past, to, quarter,) to be developed later.</p>	
<p><b>Activity</b></p> <p>The activity sheet provides the o'clock time, a digital display and blank clocks for learners to draw in the hands to show the time. Extend the task by asking learners to write down the times they could count through in order to get from o'clock to the shown time.</p>	<p><b>Video guidance</b></p> 

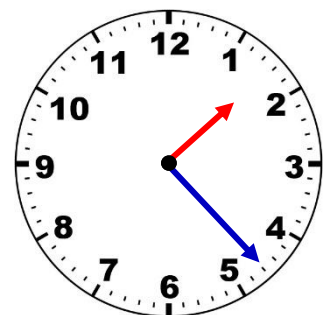
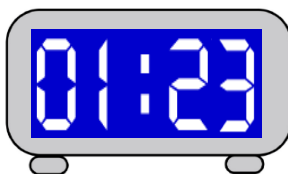
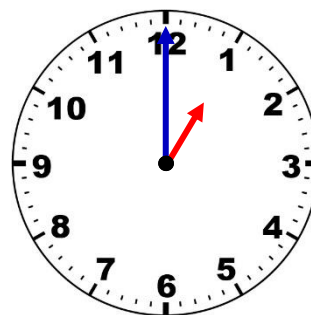
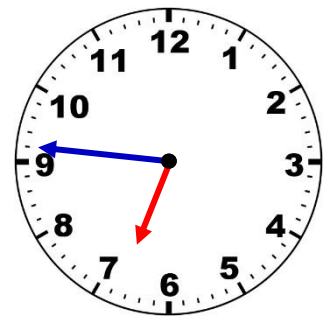
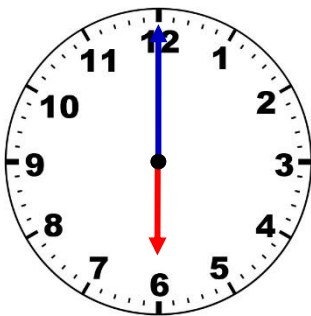
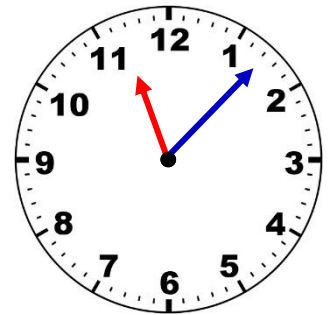
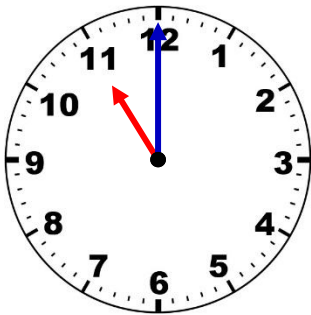


Pack 5 Session A

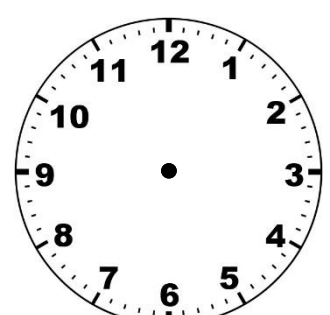
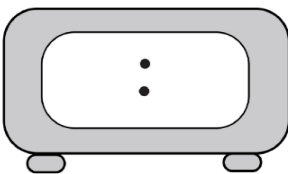
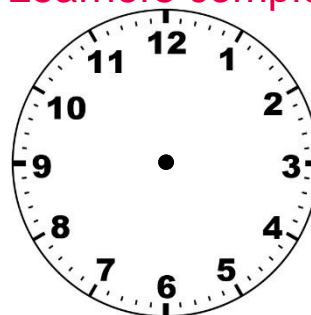
*Answers*

**Activity:** Rewind to o'clock

Use the o'clock image to draw the hands to show each time. Be precise. Then create your own example.



Learners complete their own example



**Pack 5:** Telling the time

**Session B:** Hour hand confusion

**Resources needed:** Geared clock / online teaching clock

The purpose of this session is to explore the common error of misreading the hour hand when it is close to the next hour.

**Talk Task**

The clock and speech bubble on the sheet are there to prompt a discussion about why it is easy to make mistakes like this.

Discuss what has gone wrong and notice that the mistake is made because the hour hand looks like it is on the four. Link to the previous session by showing the time on a clock, rewinding to three o'clock and counting through the hour to explain how you know that the time is actually 3:55.

Explore other times when a similar error could be made and notice that they are all times when the minute hand is between 45 and o'clock.

The underlying cause of this mistake is linked to understanding the movement of the hour hand. Learners may think that the hour hand stays on three for all the times between 3 o'clock and 4 o'clock. Sessions in the previous pack have focused on this aspect but the fact that we say the hour number makes it easy to forget that the hour hand may not actually point directly to that number.

To focus attention on the movement of the hour hand, explore when the hands are on top of each other. Lots of the times have been chosen because you might think the hands would be pointing to the same place. You can understand why you could think that at six thirty the hour hand would be on six and the minute hand would be in the same position. Explore why this is not the case.

It is true for midnight and at approximately these times:

1:06 2:11 3:17 4:22 5:27 6:33 7:38 8:44 9:49 10:54

Summarise the session by reviewing some times when it would be easy to misread the hour hand.

**Activity**

The activity sheet provides errors to correct and a prompt to explore when the hands make a straight line.

Challenge learners to write down (or say) some advice for the person who made these errors to help them understand.

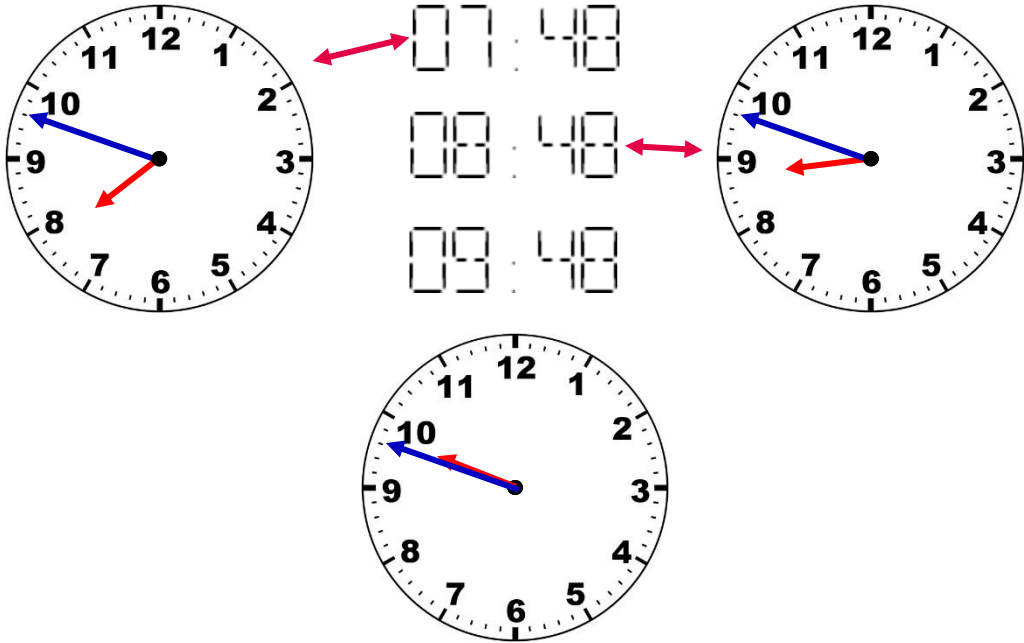
Encourage them to use a clock and make sketches to support their explanations.

**Video guidance**

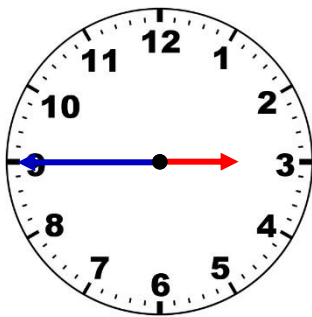


**Activity:** Hour hand confusion

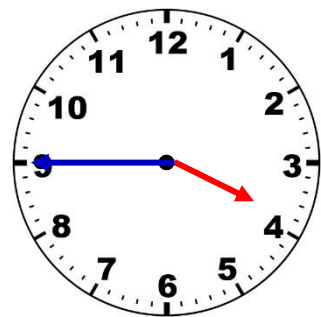
1) Which clock shows which time? Draw the hands to show the missing one.



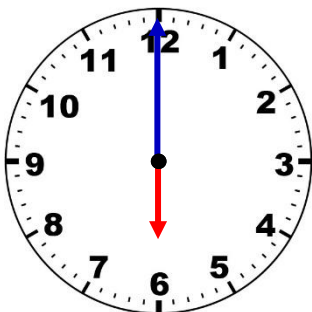
2) Correct the error



I have drawn  
3:45



3) Find some times when the hands make a straight line.  
e.g. six o'clock




*Approximately at*

*7:06, 8:11, 9:16, 10:22,*

*11:27, 12:33, 1:38,*

*2:44, 3:49 and 4:54*

<b>Pack 5:</b> Telling the time	
<b>Session C:</b> Hand mix up	
<b>Resources needed:</b> Geared clock/online teaching clock	
The purpose of this session is to practice telling the time by exploring the error of mixing up the hour and minute hand.	
<p><b>Talk Task</b> Exploring common errors and thinking about why they happen as well as how to correct them is a potential way to avoid them happening.</p> <p>The previous session focused on errors related to misreading the hour hand. This session looks at errors made when confusing which hand is which.</p> <p>The clocks and speech bubbles on the sheet are there to prompt discussion not only of which answer is correct but also of why the other answer has happened. Making sense of the incorrect answer and diagnosing what has gone wrong should lead learners to notice that the hour hand is being read as the minute hand and the minute hand is being read as the hour hand.</p> <p>Discuss each example and use a clock to show what the incorrect time would actually look like.</p> <p>At some point during these discussions, clarify which hand is which and how you know. The minute hand is the longer hand and rather than expecting this to be memorised, attach it to understanding why. The large numbers on a clockface are not for the minute hand. The minute hand is longer because it is designed to go through the hour numbers and point to the little marks between the hour markers.</p> <p>Ask learners to imagine that you are the person who made these errors and to think about what advice they would give you. Encourage them to create their own examples to guide you through correcting your errors.</p> <p>Link back to the previous session to think about examples where this mix up would not matter – this only happens when the hands are in the same position.</p>	
<p><b>Activity</b> The activity sheet asks learners to record the time each clock shows and the time you would think it shows if you mix up the minute hand and the hour hand. The final clock is left blank for learners to draw in the hands for a time of their choice.</p>	<p><b>Video guidance</b></p> 



**Activity:** Hand mix up

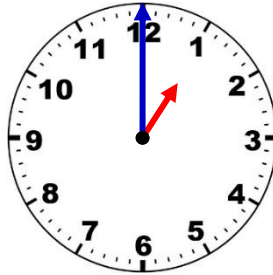
Write the time each clock shows and the time you would think it shows if you mixed up the hour and minute hand.

**Actual time**

**Hand mix up time**

*One o'clock*

*01:00*

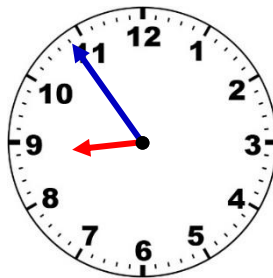


*Five past 12*

*12:05*

*Five to nine*

*8:55*

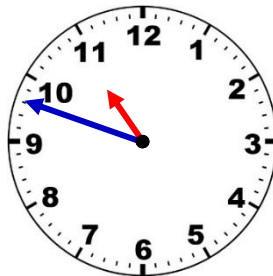


*Quarter to eleven*

*10:45*

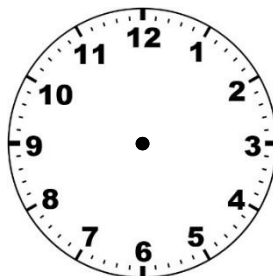
*Twelve minutes to eleven*


*10:48*



*Five to ten*

*9:55*



<b>Pack 5:</b> Telling the time	
<b>Session D:</b> Telling errors	
<b>Resources needed:</b> Geared clock or an online teaching clock	
<p>The purpose of this session is to practice telling the time by exploring errors that could happen and thinking about why they happen and how to correct them. The concept of 24 hour time is also included.</p>	
<p><b>Talk Task</b></p> <p>Start the session by writing down some times in the way they would appear on a digital clock and asking learners to use a clock to create them. Discuss errors that could be made linking back to the previous two sessions e.g. mixing up the minute and hour hands or incorrectly placing the hour hand.</p> <p>The examples on the sheet show some other errors that could come when linking digital displays and clockfaces. Ask learners to think about what has gone wrong and how to correctly show the time. In the first example, only the hour hand scale has been used for both hands and in the second example, only the minute scale has been used for both hands.</p> <p>It is worth highlighting that the times shown on the clock are not possible. Discuss how the movement of the hour hand means that the hands would never be in this position. If it was quarter to twelve, the hour hand would be just before the 12. If it was twenty past six, the hour hand would not be exactly on the 6.</p> <p>The second examples includes time shown in the 24-hour format which might be unfamiliar to learners. Discuss the concept of a.m. and p.m. being used to say if it is the morning or the afternoon. Connect this with the idea that across a full 24 hour day, the hour hand moves twice round the clockface. Create a table to show the hour numbers for 12-hour time and 24-hour time focusing on the change that happens from 1 p.m. onwards.</p> <p>Explore some other examples using 24-hour time format and you could spend another session repeating experiences from across the time packs with examples using this format. Developing confidence telling the time happens over time and reviewing the experiences across these packs at regular intervals will be needed.</p>	
<p><b>Activity</b></p> <p>The activity sheet provides similar errors and learners are to write the correct time shown by each clock. They then show what the incorrect time looks like on a clock by drawing hands onto blank clocks. The final one is left blank to challenge learners to create their own error and correction.</p>	<p><b>Video guidance</b></p> 





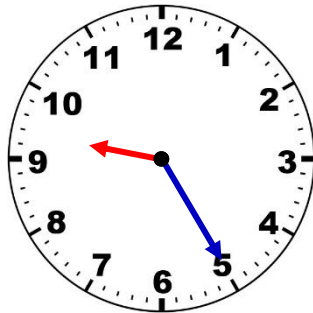
**Activity:** Telling errors

Errors have been made reading the clock. Write the time each clock shows then draw the hands to show what the incorrect time looks like

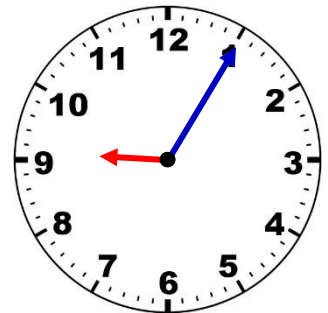
**Actual time**

**The incorrect time**

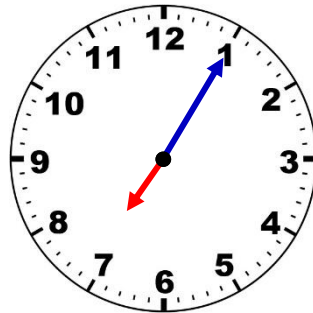
Twenty five  
past nine  
9:25



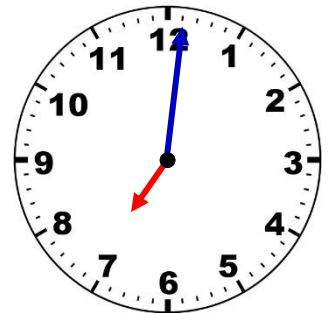
It's five past nine



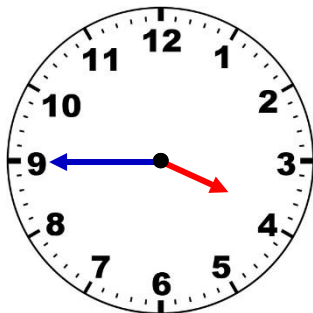
Five past  
seven  
7:05



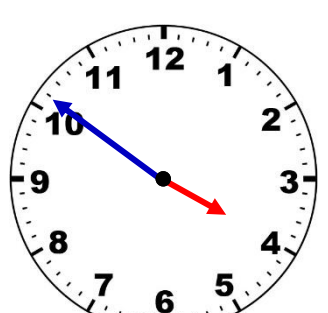
It's one past seven



Quarter to  
four  
3:45



It's nine to four



\_\_\_\_\_

\_\_\_\_\_

