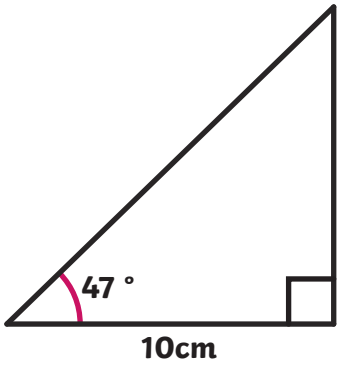
Drawing 2D Shapes Activity

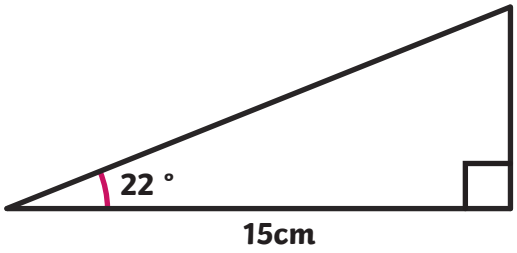
Question 1

Here is a sketch of a triangle which is not drawn to scale. Can you draw the full sized triangle accurately?



Question 2

Here is a sketch of a triangle which is not drawn to scale. Can you draw the full sized triangle accurately?



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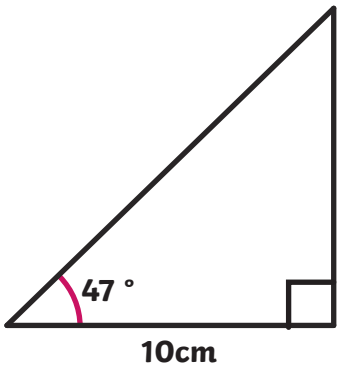
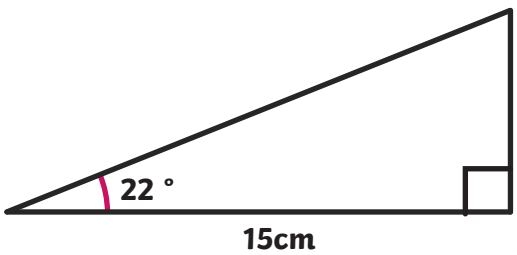
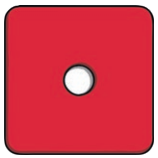
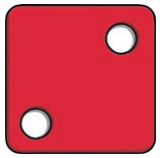
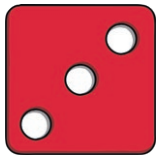
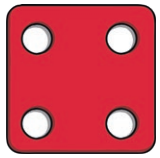
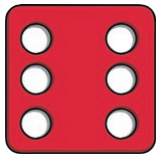


Question 2

Here is a sketch of a triangle which is not drawn to scale. Can you draw the full sized triangle accurately?



Drawing Shapes Three in a Row Game

	Draw a square with sides that are 6cm long.	Draw a 24° angle.	Draw an irregular pentagon with a 32° angle.	Draw a rectangle with a width of 9.7cm and a length of 22mm.
	Draw a 110° angle.	Draw an irregular hexagon with a 30° angle.	Draw a square with sides that are 82mm long.	Draw a right-angled triangle with a base of 14cm and a 24° angle.
	Draw a rectangle with a width of 6cm and a length of 10cm.	Draw a right-angled triangle with a base of 8.2cm and a height of 93mm.	Draw a 75° angle.	Draw an irregular pentagon with a 48° angle.
	Draw a right-angled triangle with a base of 5.6cm and a height of 100mm.	Draw a 115° angle.	Draw a rectangle with a width of 42mm and a length of 7cm.	Draw an irregular hexagon with a 17° angle.
	Draw an irregular hexagon with a 42° angle.	Draw a 51° angle.	Draw a right-angled triangle with a base of 13cm and a 31° angle.	Draw a square with sides that are 11.2cm long.
	Draw a square with sides that are 4.5cm long.	Draw a right-angled triangle with a base of 42mm and a height of 6cm.	Draw a 123° angle.	Draw an irregular pentagon with a 50° angle.

	Name:			Date:	
Same-Day Intervention Assessment	**Child A**	**Child B**	**Child C**	**Child D**	**Child E**
Draw 2D shapes using given lengths on grid paper.					
Draw 2D shapes using given lengths on plain paper.					
Draw an angle using a protractor.					
Draw a 2D shape to scale from a diagram.					
Additional Notes					

Same-Day Intervention: **Drawing 2D Shapes Accurately**

Children will learn how to draw 2D shapes accurately on grid and plain paper.

Pre-Intervention Check

To access this intervention, can the children...

*Tick as appropriate.

...use a ruler to draw straight lines of a given size?*

...use a protractor to draw an angle of a given size?*

Explaining the Misconception in Mathematical Understanding

Common Misconception:

Not being able to apply their drawing skills to draw a 2D shape accurately to given criteria.

For example, if asked to draw a triangle with a given length and angle on plain paper, a child may not know where to start to ensure their drawing is accurate, such as drawing the base first.

This intervention will help prepare children to solve geometry problems in key stage 3.

Summary of Intervention

Draw 2D shapes using given lengths on grid paper.

Draw 2D shapes using given lengths on plain paper.

Draw an angle using a protractor.

Draw a 2D shape to scale from a diagram.

Preparation	Key Vocabulary
• Square-centimetre paper or **1cm Grid Paper**	• Base, height, width
• Plain paper	• Millimetres (mm), centimetres (cm)
• Ruler (1 per child)	• Right angle, obtuse, acute
• Protractor (1 per child)	• Degrees (°)
• **Drawing 2D Shapes Activity**	• Parallel lines
• **Drawing Shapes Three in a Row Game** (1 per pair)	• Vertex
• Dice (1 per pair)	• Regular, irregular
	• Protractor

Key Questions for Deepening Understanding

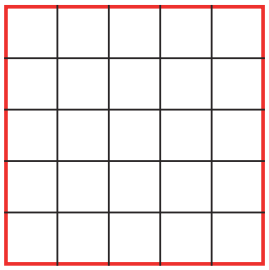
Draw 2D shapes using given lengths on grid paper.

Hand each child a sheet of square-centimetre paper or **1cm Grid Paper.**

Explain that they are going to work through how to draw a square with sides which are 5cm long.

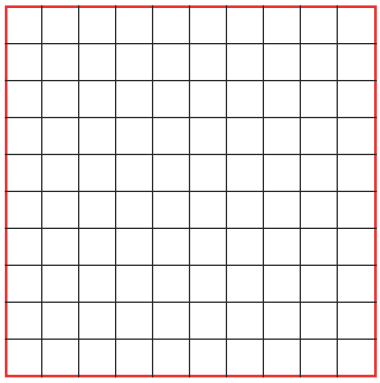
- **What are the properties of a square?** (four right angles, four sides of equal length)
- **How long will each side of the square be?** (5cm)
- **How long is each square on the grid paper?** (1cm)
- **How many squares long on the grid paper will each side of our shape be? How do you know?**
- **How can we use the grid paper to accurately draw our square?** (start at the vertex, draw the side of the shape accurately on the line of the grid)

Children draw their square (as shown).



- **Can you draw a square which is double the length and height of the previous square?**

Repeat the above questions to support children in drawing the new square (as shown).



Draw 2D shapes using given lengths on plain paper.

Hand each child a sheet of plain paper. Explain that they are going to work through how to draw a rectangle which has a width of 82mm and a height of 4.6cm. Write these measurements on a whiteboard.

- **What are the properties of a rectangle?** (four sides, opposite sides are parallel and equal in length, four right angles)

Explain that they are going to start by drawing the width of the rectangle.

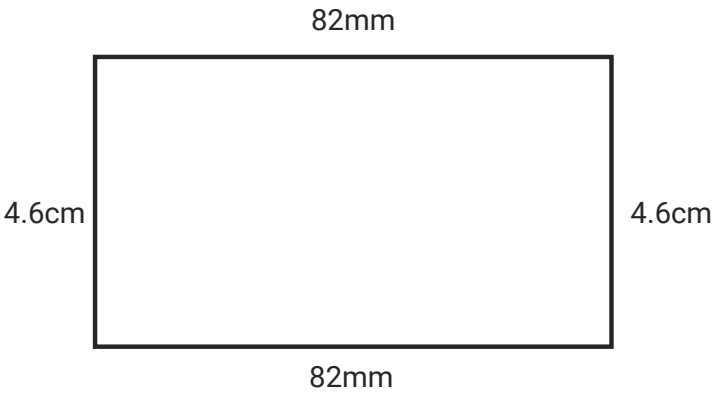
- **How long is the width of the rectangle?** (82mm)
- **How many millimetres are equivalent to one centimetre?** (10mm)

Children repeat, '10mm is equivalent to 1cm.'

- **What is 82mm in centimetres?** (8.2cm)
- **How do you know?**
- **Can you draw the width of the rectangle?**

Check that children are using their rulers accurately

- **Which side should we draw next?** (the length)
- **What is the length of the rectangle?** (4.6cm)
- **Can you draw the length of the rectangle?**
- **Can you complete your rectangle ensuring that both sets of parallel lines are the same length?** (as shown)

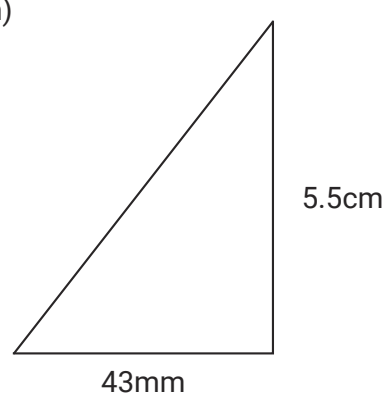


Key Questions for Deepening Understanding (Continued)

- **Can you draw a right-angled triangle with a base of 43mm and a height of 5.5cm?**

Write these measurements on a whiteboard.

- **What are the properties of a right-angled triangle?** (three straight sides, one right angle)
- **Which side should we draw first?** (the base)
- **How long is the base in cm?** (4.3cm)
- **How do you know?**
- **Can you draw the base of the triangle?**
- **What is the height of the triangle?** (5.5cm)
- **What other properties do we need to remember when drawing the height of a right-angled triangle?** (It has a right angle.)
- **Can you draw the height of the right-angled triangle?**
- **Can you complete your right-angled triangle?** (as shown)

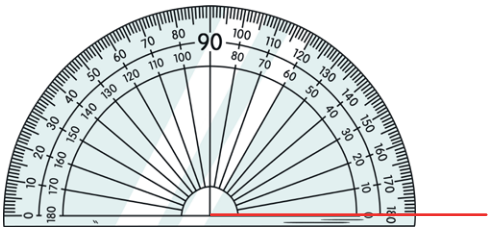


Draw an angle using a protractor.

Hand each child a protractor.

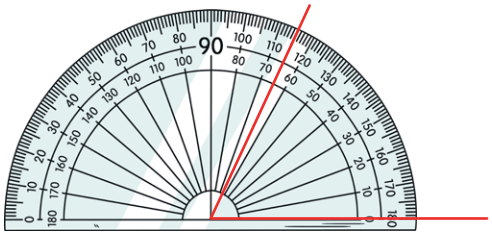
- **Can you draw a 65° angle on your plain paper?**
- **What type of angle is a 65° angle?** (acute)
- **How do you know?** (It is smaller than 90°.)
- **What can we use to draw an angle accurately?**
- **What do we need to do first when drawing an angle?** (Draw a straight line with a ruler.)
- **How do we use a protractor to draw the angle?**

Demonstrate how to put the centre of the protractor on to the vertex of the angle and line the horizontal line of the angle up with the 0° marker. Children line up their protractors (as shown).



- **What do you notice about the scales on the protractor?** (there are two scales)
- **Which should we use and why?** (the inner scale if we are drawing our angle anticlockwise, the outer scale if we are drawing our angle clockwise)
- **Can you draw your 65° angle by carefully counting the scale?**

Children complete the angle (as shown).



Repeat the above questions for a 143° angle.

- **Can you draw an irregular hexagon where one angle measures 23°?**
- **What are the properties of an irregular hexagon?** (It is a six-sided shape that does not have equal sides or angles.)
- **How should we start drawing our shape?** (Draw the 23° angle.)
- **What do we need to do first when drawing an angle?** (Draw a straight line with a ruler.)
- **Can you line your protractor up accurately?**

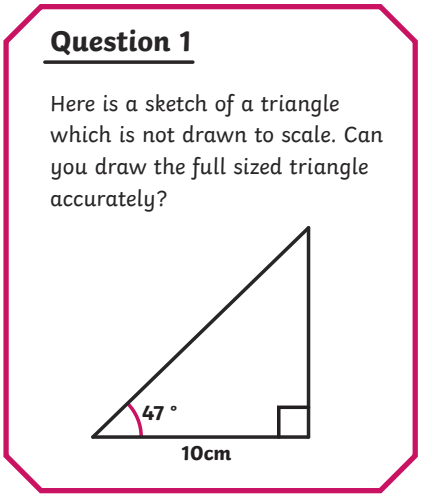
Key Questions for Deepening Understanding (Continued)

- **Can you draw the 23°angle?**
- **How can we complete the irregular hexagon?** (Draw five more sides.)
- **Do we need to measure the remaining angles or sides? Why?** (No, it is an irregular hexagon and no further measurements have been given.)

Children complete their irregular hexagon with a ruler.

Draw a 2D shape to scale from a diagram.

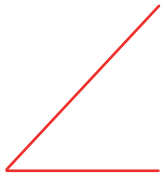
Hand children a copy of and focus on question 1. Explain that this image is not drawn to scale.



- **What shape is this?**
- **What are the properties of a right-angled triangle?**
- **What part of the right-angled triangle should we draw first?** (the base)
- **How long should the base of the triangle be?**
- **Can you draw a line which is 10cm long?**
- **What should we do next?** (Draw the 47° angle.)
- **Can you line your protractor up accurately?**
- **Which scale on the protractor should we use? Why?**

  (the inner scale as the image shows that we will need to draw the angle anticlockwise)
- **How long should this side be?** (This side should end directly above the vertex where the right angle will go.)

Model this on the board (as shown).



Children draw the angle using a protractor.

- **What should we do to complete our triangle?** (Draw the third side, ensuring there is a right angle.)

Repeat the above questions for question 2.

Additional Opportunities to Reinforce Learning

Play the **Drawing Shapes Three in a Row Game**. Children should work in pairs, taking it in turns to roll the dice. Whichever number they land on, they should choose one of the questions to complete in that row. If they complete the question correctly, they can cross off that question. The first player to get three in a row either horizontally, vertically or diagonally wins.

Home Learning Slip

Today, at school, your child has been learning to draw shapes accurately using a ruler and protractor. To support their learning further, you could complete this activity together at home. Your child will need a ruler and a protractor.

Wassily Kandinsky was a famous artist. His work often included maths. Can you research some of his work online? Can you create your own version? In your maths art, include the following:

- A square with sides that are 56mm long.
- A rectangle with a width of 45mm and a height of 7.8cm.
- A 56° angle and a 98° angle.
- A right-angled triangle with a base of 76mm and a height of 9.1cm.
- An irregular hexagon with a 46° angle.

Thank you for your support with this. Your help will really make a difference to your child.

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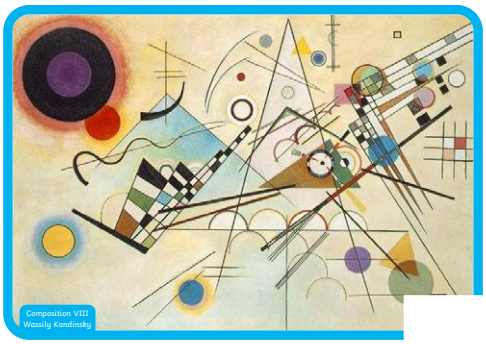

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