Maths and Me: 1st Class – Short-Term Plan, Unit 6: Shapes (November: Weeks 3&4)

Strand(s) > Strand unit(s)	Shape and Space > Shape.
Learning Outcome(s)	Through appropriately playful and engaging learning experiences children should be able to examine, categorise and model 3-D and 2-D shapes.

Lesson	Focus of Learning (with Elements)	CM	Learning Experiences	Assessment
1	**Exploring Shapes:** Compares properties (faces, sides, corners, vertices) of shapes (U&C); Compares and contrasts shapes and shape families based on their properties (R)		D Notice & Wonder L1, 7 D C Think-Pair-Share L1–8 D C Reason & Respond L1–8 D Write-Hide-Show L1 D C Would This Work? L2 P C Maths Eyes L4–5 C Changing Shapes L5 C Same-But-Different Challenge L6 C Stations L8 **Print resources** Pupil Book pages 38–44 Home/School Links Book pages 16–17 PCMs 26, 27, 28, 29, 30	**Intuitive Assessment:** responding to emerging misconceptions **Planned Interactions:** responding to insights gleaned from children's responses to learning experiences **Assessment Events:** information gathered from completion of the unit assessment in the Progress Assessment Booklet pages 14–15
2	**Properties of 2-D Shapes:** Analyses and discusses the results of shape-sorting activities using appropriate mathematical language (C); Describes the key differences and similarities of 2-D shapes according to their properties (C)			
3	**2-D Shapes: Sides and Corners:** Compares and contrasts shapes based on their properties (R); Describes the key differences and similarities of 2-D shapes according to their properties (C)			
4	**Classifying 2-D Shapes:** Sorts an increased range of shapes according to at least two properties (R)			
5	**Shapes in Shapes:** Sorts 2-D shapes according to whether they contain right angles or not (A&PS); Combines and partitions 2-D shapes (for example: using tangrams/pattern blocks) (A&PS)			
6	**Naming and Sorting 3-D Shapes:** Presents a wide range or purposes for the potential use of 3-D shapes (A&PS); Compares and contrasts shapes and shape families based on their properties (R); Sorts an increased range of shapes according to at least two properties (R)			
7	**3-D Shapes: Faces, Surfaces, Edges and Corners:** Compares properties (faces, sides, corners, vertices) of shapes (U&C); Describes the key differences and similarities of shapes according to their properties (C)			
8	**Building with 3-D Shapes:** Deconstructs and reconstructs everyday items (for example: using containers or packaging) (A&PS); Compares properties (faces, sides, corners, vertices) of shapes (U&C); Models 2-D and 3-D shapes using materials or through drawing (U&C)			
9	**Review and Reflect:** Reviews and reflects on learning (U&C)			

Key: Elements: (U&C) Understanding and Connecting; (C) Communicating; (R) Reasoning; (A&PS) Applying and Problem-Solving. **CM: Cuntas Míosúil:** please tick when you have completed the focus of learning. **Learning Experiences:** C concrete activity; D digital activity; P activity based on printed materials, followed by lesson numbers.

Additional information for planning

Progression Continua	See '1st Class *Maths and Me* Progression Continua Overview' for a detailed breakdown of how all progression continua are covered.
Maths Language	See '1st Class *Maths and Me* Maths Language Overview', individual lesson plans and Unit 6 Maths Language Cards.
Equipment	See '1st Class *Maths and Me* Maths Equipment Overview' and individual lesson plans.
Inclusive Practices	• See Let's Strengthen and Let's Deepen suggestions throughout lesson plans. • See Unit 6 Let's Strengthen Suggestions for Teachers. (These address the Common Misconceptions and Difficulties listed below.) • See Unit 6 Let's Strengthen PCM. • See Unit 6 Let's Deepen PCM.
Integration	See individual lesson plans.

Background and rationale

- 'Shape' is the first Shape and Space unit in *Maths and Me* for 1st Class. It is designed to revise and develop the content of Shape in *Maths and Me* for Senior Infants, as well as prepare the children to apply their understanding to Transformation, and Spatial Awareness and Location, which are combined as Unit 9 Location and Transformation.
- Maths Eyes and concrete activities are particularly important in this unit where the overarching theme is Shapes in the World Around Us – the natural world, the classroom and the home. This allows the children to frequently handle the physical representations and therefore to flexibly visualise shapes.
- Faces: Traditionally in Ireland, and in Irish textbooks, a cylinder was recorded as having three faces. However, this is not mathematically correct, as strictly speaking a face is flat and is a 2-D shape, so therefore a cylinder has in fact only two faces (both circles) and one curved surface. It may be argued that a cylinder has a third face, i.e. the rectangular shape you see when you disassemble the net of the 3-D object. However, in this disassembled state it is no longer a cylinder, since it can no longer roll – a specific property of the cylinder. Similarly, a sphere has no faces and only one continuous curved surface.
- Another way to think about the faces of 3-D objects is to consider the number and shape of the resulting outlines of tracing around, or printing, each surface of the 3-D object. It is only possible to trace around the opposite ends/bases of the cylinder, since only these are flat, and thus it has only two faces, both of which are circular in shape. Similarly, it is only possible to trace around one surface on a cone, which therefore means it has only one face (a circle) and one curved surface.
- Edges: Edges are specific to 3-D shapes and therefore should not be used to describe the outsides of 2-D shapes, which are sides. When considering edges, how many edges does a cylinder have? Officially none, because an edge is where two flat faces meet, whereas the faces on a cylinder are on opposite sides and do not touch/meet. However, that leaves the problem of how to describe the place where each face meets the curved surface. In *Maths and Me*, as typically occurs in primary textbooks in other countries, a distinction is made between straight edges (which are in fact true edges) and curved edges (which strictly speaking are not edges).
- Vertices (corners): Note that in *Maths and Me* for 1st Class the term 'corners' is used, but some classes may be able for the term 'vertices'. A vertex is formed where two or more straight edges or straight sides meet. Therefore, a cone does not have a vertex; instead, its tip can be referred to as a 'point' or 'tip' (or an 'apex' in older classes).

The theme of this unit is **Shapes in the World Around Us**.

Common misconceptions and difficulties

- The children may apply the names of 2-D shapes to 3-D shapes or vice versa (e.g. confuse circle and sphere, or square and cube).
- They may fail to recognise a shape when its orientation changes and may focus on superficial differences such as colour or size.
- They may be confused about surfaces (3-D) and faces (2-D).
- When they are trying to find the missing part of a pattern, they may focus only on the missing section and fail to look before or beyond to see how the pattern continues. This can mean that children do not gather enough information to complete the pattern. Ask:
  - How do you know what the missing shape is?
  - Which parts of the pattern did you look at to help you?
- The children may recognise equilateral triangles only, and fail to recognise other types of triangles as being triangles.
- They may refer to 'upside down' triangles to describe representations of triangles which are not those of an equilateral triangle standing on one side.
- They may confuse key language (e.g. faces, corners).
- They may miscount the number of edges, sides, corners or faces and need encouragement to develop a systematic way of doing this (see the Unit 6 Let's Strengthen Suggestions for Teachers).
- They may struggle to recognise that categories of shapes often have subsets of shapes within them. For example: They may not recognise that squares also belong to rectangles (i.e. that a square has all the properties of a rectangle, as well as having four sides the same length).

The Unit 6 Let's Strengthen Suggestions for Teachers address the common misconceptions and difficulties listed above.

Mathematical models and representations

- Physical and pictorial representations of 2-D and 3-D shapes
- 'Real-life' shapes
- Tangrams
- Various construction materials from which shapes can be made

'Real-life' 2-D shapes

Triangle

Square

Rectangle

Circle

Oval

Semi-circle

'Real-life' 3-D shapes

Sphere

Cube

Cuboid

Cylinder

Cone

Teaching tip

2-D Shapes and Tangrams manipulative printables are available to support this unit. Click on the resources icon on the *Maths and Me* book cover on **edcolearning.ie**

Day 1, Lesson 1

Exploring Shapes

Focus of learning (with Elements)

- Compares properties (faces, sides, corners, vertices) of shapes (U&C)
- Compares and contrasts shapes and shape families based on their properties (R)

Learning experiences

- (D) Digital activity: Shapes in Nature ***MAM* Routines: Notice & Wonder, with Think-Pair-Share**
- (D) (C) Digital activity: Shapes in Nature ***MAM* Routines: Reason & Respond, with Think-Pair-Share**
- (D) Digital activity: Which Shape Has Monty Hidden? ***MAM* Routines: Reason & Respond, with Write-Hide-Show**

Equipment

- Sets of 2-D and 3-D shapes (at least one of each type): circle, semi-circle, triangle, square, rectangle, oval, cube, cuboid, sphere, cylinder, cone

Maths language

- flat, 2-D, 3-D, sides, straight, curved, shape family, square, rectangle, circle, triangle, oval, semi-circle, cube, cuboid, sphere, cylinder, cone, face, edge, corner, vertex, roll, stack

Warm-up

(D) **Digital activity: Shapes in Nature**
***MAM* Routines: Notice & Wonder, with Think-Pair-Share**

Play the slideshow and, using Think-Pair-Share, click to play or ask:

- What do you notice?
- What do you wonder?

Record the children's responses to both questions on the board. Allow the children the opportunity to respond to (agree/disagree with or query) others' responses, but do not confirm or reject any of the ideas. Note any 'wonderings' that could become the basis for a subsequent maths investigation.

If the children have not discussed it already, say/ask:

- Use your Maths Eyes. What do you think this unit is about?

Main event

(D) (C) **Digital activity: Shapes in Nature**
***MAM* Routines: Reason & Respond, with Think-Pair-Share**

Distribute sets of 2-D shapes and 3-D shapes to the class. Play the slideshow from the warm-up again. Use Think-Pair-Share and pause at each slide to discuss, compare and contrast the properties of the shapes, using relevant questions. For example, for 2-D shapes, ask/say:

Assessment Opportunity

- What shape can you see on the board?
- Can you see an example of this shape on your table?
- Would you describe this shape as flat (2-D)?
- Try standing a flat (2-D) shape on the palm of your hand. Is it possible? (No.)
- Try standing a shape that is not flat (3-D) on the palm of your hand. Is it possible? (Yes.)
- Are the sides of this 2-D shape straight or curved?
- On your table, group all of the 2-D shapes with straight sides into a shape family.
- On your table, group all of the 2-D shapes with curved sides into a shape family.
- What do you notice?

- Can you name each 2-D shape? (The oval and semi-circle are new in 1st Class. Some children may know the names – use revoicing to embed.)
- How does your hand move along a straight side?
- How does your hand move along a curved side?

Teaching tip

If holding shapes up to the class, ensure that you show the shapes rotated, so that the children do not develop the misconceptions that some triangles are 'upside down' or that a rotated square is a 'diamond'.

For 3-D shapes, ask/say:

- Can you name each 3-D shape? (The cone is new to 1st Class. Some children may know the name – use revoicing to embed.)
- How many faces does this shape have? (A face must be flat.)
- Does the shape have a curved surface?
- Move your hand over the curved surface. How does it feel?
- In the air, show me the movement of your hand over a curved surface.
- Group the shapes with a curved surface into a shape family.
- Does any shape have both a flat face/flat faces and a curved surface?
- Group the shapes that have both a flat face/flat faces and a curved surface into a shape family.
- How many straight edges does this 3-D shape have? (A straight edge is where two flat surfaces meet.)
- Do the straight edges meet in a corner?
- How does a corner feel?

Teaching tip

Use the terms 'corner' and 'vertex' interchangeably if you think your class is ready.

- Would this shape roll down a hill?
- Group the shapes that can roll into a shape family.
- Can you stack this shape, one on top of the other?
- Group the shapes that can stack into a shape family.

Note that this activity provides an opportunity to informally introduce the following vocabulary: *circular*, *triangular*, *rectangular*.

Teaching tip

Compare a 2-D and a 3-D shape. Draw attention to the 'flatness' of the 2-D shape. In comparison to the 3-D shape, it has no depth.

D **Digital activity: Which Shape Has Monty Hidden? *MAM* Routines: Reason & Respond, with Write-Hide-Show**

Display the flipcards activity, in which Monty has hidden various shapes under his cushion. Using the visual clues, ask the children to figure out which shape is hidden on each card. Ask them to draw all possible answers on their MWBs. Flip each card to reveal the answer.

Let's strengthen

The Unit 6 Let's Strengthen PCM can be used for a matching activity to reinforce the shape names. The cards should be cut up so that the pictures and names are separate.

Let's deepen

Ask the children to sort a variety of shapes according to different properties.

Optional consolidation and extension possibilities

Story Read *Math Fair Blues* by Sue Kassirer, or listen to a reading at: edco.ie/4sr5

Visual Arts Create art by using 3-D shapes to print 2-D shapes.

STEM Provide playdough and lollipop sticks for the children to recreate 2-D and 3-D shapes.

Investigation Station Free-play with building blocks of different shapes and sizes.

Games Bank Play 'What Shape Am I?'

Day 2, Lesson 2

Properties of 2-D Shapes

Focus of learning (with Elements)

- Analyses and discusses the results of shape-sorting activities using appropriate mathematical language (C)
- Describes the key differences and similarities of 2-D shapes according to their properties (C)

Learning experiences

- D C Toolkit: Shape of the Day
  MAM Routines: Reason & Respond, with Think-Pair-Share
- D C Digital activity: 2-D Shapes
  MAM Routine: Would This Work?
- P Pupil's Book page 38: Properties of 2-D Shapes

Equipment

- Sets of 2-D and 3-D shapes (at least one of each type): circle, semi-circle, triangle, square, rectangle, oval, cube, cuboid, sphere, cylinder, cone
- Sorting circles or containers for sorting

Maths language

- lines, width, length, sorting, same, different

Warm-up

D C Toolkit: Shape of the Day *MAM* Routines: Reason & Respond, with Think-Pair-Share

This is a teacher-led activity. Distribute sets of 2-D shapes and 3-D shapes to the class. Open the Shapes tool from the Manipulatives e-Toolkit and display all the relevant 2-D and 3-D shapes on the IWB. Choose a shape to describe, e.g. the square, and give clues to gradually eliminate all the other shapes.

Using Think-Pair-Share, begin with the first shape and ask/say:

- I am a 2-D shape. What could I be?
- Discuss with your partner and choose all the possible answers from the shapes in front of you.
- Share your answers with the class. Explain your choices.

Eliminate all the 3-D shapes from the IWB display. Continue to use Think-Pair-Share in each subsequent round. When the children have shared their answers and explained their reasoning, eliminate the shapes that have been ruled out from the IWB display. Then, the children choose the possible answers from the shapes in front of them.

Clues for a square, for example, could include:

- My sides are straight lines only.
- I have four sides altogether.
- My opposite sides are the same width apart, like train tracks.
- My opposite sides are the same length.
- All my sides are the same length.

Teaching tip

If the shape of the day is 2-D, use one 2-D shape to make a picture frame for a picture of Monty.

Main event

D C Digital activity: 2-D Shapes *MAM* Routine: Would This Work?

The children need concrete examples of each 2-D shape, including the oval and the semi-circle. Ask the children to consider the shape-sorting rule suggested by the characters and to attempt to sort their shapes by that rule. Ask/say:

Assessment Opportunity

- What is the sorting rule?
- Name the shapes in each group.

- What is the same? What is different?
- Are any shapes not in either group? Why? Name them.

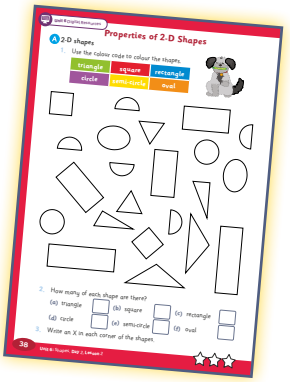
Let's strengthen

Provide children with support in sorting the shapes, which will allow them to focus on the discussion. Use the shape-naming cards (with names still attached to pictures) from the Unit 6 Let's Strengthen PCM to further support some children.

Let's deepen

Ask the children to use their Maths Eyes and their MWBs to sort and draw 2-D shape families they can see around them.

P **Pupil's Book page 38: Properties of 2-D Shapes**



Optional consolidation and extension possibilities

Maths Journal The children draw or write the results of the shape-sorting activity from the Main Event section. They could also cut out images of 2-D shapes in the everyday world from newspapers and magazines and paste them in their Maths Journals.

Estimation Station Provide a transparent bag of a variety of 2-D shapes of different colours (up to 30) and ask the children to estimate how many altogether, how many of each shape, and how many of each colour.

Day 3, Lesson 3

2-D Shapes: Sides and Corners

Focus of learning (with Elements)

- Compares and contrasts shapes based on their properties (R)
- Describes the key differences and similarities of 2-D shapes according to their properties (C)

Learning experiences

D **C** Toolkit: Shape of the Day
MAM **Routines: Reason & Respond, with Think-Pair-Share**

D Digital activity: Which One Doesn't Belong? (2)
MAM **Routines: Reason & Respond, with Think-Pair-Share**

P Pupil's Book page 39: 2-D Shapes: Sides and Corners

Equipment

- Sets of 2-D and 3-D shapes (at least one of each type): circle, semi-circle, triangle, square, rectangle, oval, cube, cuboid, sphere, cylinder, cone

Maths language

- round

Warm-up

D C Toolkit: Shape of the Day *MAM* Routines: Reason & Respond, with Think-Pair-Share

Distribute sets of 2-D shapes and 3-D shapes to the class. Open the Shapes tool and display all the 2-D and 3-D shapes on the IWB. Choose a 2-D shape to describe, e.g. the oval, and give clues to gradually eliminate all the other shapes.

Using Think-Pair-Share, begin with the first shape and ask/say:

- I am a 2-D shape. What could I be?
- Discuss with your partner and choose all the possible answers from the shapes in front of you.
- Share your answers with the class. Explain your choices.

Eliminate all the 3-D shapes from the IWB display.

Continue to use Think-Pair-Share in each subsequent round. When the children have shared their answers and explained their reasoning, eliminate the shapes that have been ruled out from the IWB display. Then, the children choose the possible answers from the shapes in front of them.

Clues for an oval, for example, could include:

- I have no corners.
- I have no straight sides.
- I am not a perfectly round shape.

Teaching tip

A child may be ready to lead this activity. This could also be done in pairs or small groups.

Main event

D Digital activity: Which One Doesn't Belong? (2) *MAM* Routines: Reason & Respond, with Think-Pair-Share

The children explore key differences and similarities in 2-D shapes. Play the slideshow, one slide at a time, and focus attention on each of the shapes. Using Think-Pair-Share, ask:

Assessment Opportunity

- Which one doesn't belong? Why?

Tell the children to record their answers on their MWBs.

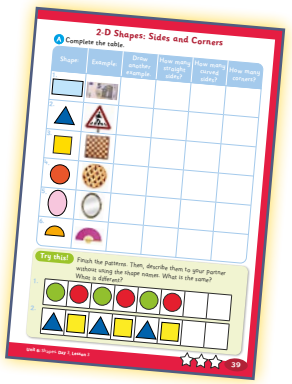
Teaching tip

This activity also presents opportunities to notice and discuss pattern. Multiple answers are possible, based on colour, orientation, whether regular/irregular shapes and, importantly, shape properties.

Let's strengthen

Use the shape-naming cards from Lesson 1 (see the Unit 6 Let's Strengthen PCM) to further support the children.

P Pupil's Book page 39: 2-D Shapes: Sides and Corners



Optional consolidation and extension possibilities

Story Read *Three Pigs, One Wolf, and Seven Magic Shapes* by Grace Maccarone, or listen to a reading at: edco.ie/2c8c

The children can use tangrams to recreate the shapes.

Investigation Station Use shape pieces to create patterns.

Shape Display Ask the children to bring photos or drawings from home to show real-life examples of 2-D shapes.

Day 4, Lesson 4

Classifying 2-D Shapes

Focus of learning (with Elements)

- Sorts an increased range of shapes according to at least two properties (R)

Learning experiences

(D) (C) Toolkit: What Shape Am I?
MAM Routines: Reason & Respond, with Think-Pair-Share

(D) Digital activity: Describing Shapes
MAM Routines: Reason & Respond, with Think-Pair-Share

(P) (C) Concrete activity: Maths Eyes

(P) Pupil's Book page 40: Classifying 2-D Shapes

Equipment

- 2-D and 3-D shapes
- PCM 26

Maths language

- There is no new maths language for this lesson.

Warm-up

(D) (C) **Toolkit: What Shape Am I? *MAM* Routines: Reason & Respond, with Think-Pair-Share**

Distribute sets of 2-D shapes and 3-D shapes to the class. Open the Shapes tool and display all the 2-D and 3-D shapes on the IWB. Choose a 3-D shape to describe, e.g. the cylinder, and give clues to gradually eliminate all the other shapes.

Assessment Opportunity

Using Think-Pair-Share, begin with the first shape and ask/say:

- I am a 3-D shape. What could I be?
- Discuss with your partner and choose possible answers from the shapes in front of you.
- Share your answers with the class. Explain your choices.

Eliminate all the 2-D shapes from the IWB display. Continue to use Think-Pair-Share in each subsequent round. When the children have shared their answers and explained their reasoning, eliminate the shapes that have been ruled out from the IWB display. The children choose the possible answers from the shapes in front of them.

Clues for a cylinder, for example, could include:

- I have a curved surface.
- I have a flat face too.
- My flat face is circular.

Teaching tip

As children 'share', use revoicing to reinforce the vocabulary.

Main event

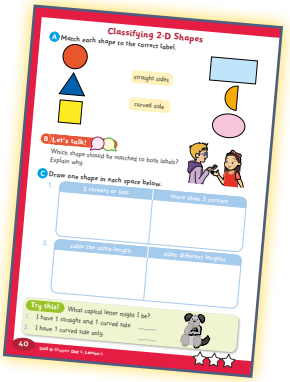
(D) **Digital activity: Describing Shapes *MAM* Routines: Reason & Respond, with Think-Pair-Share**

Play the slideshow, in which the children must describe different shapes using two words from a set of suggested words. Click to play the audio question for each slide. Use Think-Pair-Share for feedback.

(P) (C) **Concrete activity: Maths Eyes**

Distribute copies of PCM 26: Shape Hunt. Go on a 3-D shape hunt in the classroom, school or playground.

(P) **Pupil's Book page 40: Classifying 2-D Shapes**



Optional consolidation and extension possibilities

Tangram Station Create a Tangram Station and provide sets of the 7 tangram pieces and printouts of tangram puzzles (see Tangrams manipulative printable).

Home/School Links Book Page 16 can be completed at any stage after this lesson.

Guess the Shape Provide a non-transparent bag and shapes. The children work in pairs. One child secretly puts a shape inside the bag and challenges their partner to guess the shape by touch only.

Let's Investigate Make 2-D shape patterns.

Day 5 and 6, Lesson 5

Classifying 2-D Shapes

Focus of learning (with Elements)

- Sorts 2-D shapes according to whether they contain right angles or not (A&PS)
- Combines and partitions 2-D shapes (for example: using tangrams/pattern blocks) (A&PS)

Learning experiences

- (D) Digital activity: Sorting Shapes
  ***MAM* Routines: Reason & Respond, with Think-Pair-Share**
- (C) Concrete activity: Changing Shapes
- (D) Toolkit: Shapes
  ***MAM* Routines: Reason & Respond, with Think-Pair-Share**
- (D) Video: Square Corners
  ***MAM* Routines: Reason & Respond, with Think-Pair-Share**
- (C) Concrete activity: Maths Eyes
- (P) Pupil's Book page 41: Shapes in Shapes

Equipment

- 2-D shapes
- PCM 27

Maths language

- square corner, right angle

Warm-up

(D) Digital activity: Sorting Shapes *MAM* Routines: Reason & Respond, with Think-Pair-Share

The children need 2-D shapes to hand. Play the interactive game, in which the children will sort sets of shapes into two groups. Display the first set of shapes and ask:

- What is the same?
- What is different?

Using Think-Pair-Share, tell the children:

- Think of a rule to sort the shapes.
- Discuss the rule with your partner. Will it work?
- Share the rule with the class. Can the class guess your sorting rule?

Repeat the activity with the other sets of shapes.

Main event

(C) Concrete activity: Changing Shapes

Distribute scissors, glue and copies of PCM 27: 2-D Shape Cut-outs to each child. The children investigate the shapes in pairs or small groups by tracing, drawing, cutting, gluing and folding them.

Remind the children that there may be more than one correct answer. Sample investigations:

- Can triangle 1 become a square?
- Can a square become a triangle?

- How many triangles can you make from one whole square?
- Can a square become a rectangle?
- Can a rectangle become a square?
- How many squares can you make from one whole rectangle?
- Can triangle 2 become a square?
- Can an oval become a circle?
- Can triangle 3 become a square?
- Can a circle become a semi-circle?
- How many semi-circles can you make using one whole circle?

Showcase the children's best practice to the class. For example, highlight that a square can become two triangles with no pieces left over, and a rectangle can become two squares with no pieces left over.

Teaching tip

Redistribute the cut-up shapes and ask the children to combine them into different shapes.

Let's strengthen

Pre-prepared cut-out shapes and pattern blocks can also be used for combining and partitioning of shapes.

Let's deepen

Make irregular 2-D shapes by combining two or more cut-outs (PCM 27). You can give criteria, e.g. an irregular shape with seven corners. When sorting shapes, the children may be ready to use the 'right angle' criteria.

Use the Unit 6 Let's Deepen PCM and ask the children to make regular shapes out of irregular shapes.

D **Toolkit: Shapes *MAM* Routines: Reason & Respond, with Think-Pair-Share**

From the Shapes tool, display a square on the IWB. Ask/say:

- Can you name this shape?
- Describe this shape using two of these words: *corner*, *side*, *straight*, *curved*, *three*, *four*.

From the Shapes tool, dsplay an equilateral triangle alongside the square. Ask/say:

- Can you name this shape?
- Describe this shape using two of these words: *corner*, *side*, *straight*, *curved*, *three*, *four*.

Now ask/say:

- What is the same and what is different about these two shapes? Use two of these words: *corner*, *side*, *straight*, *curved*, *three*, *four*.
- On your MWB, draw a corner of a square, then a corner of this triangle.
- What do you notice?

Explain to the children that the corner of a square is a 'square corner'.

D **Video: Square Corners *MAM* Routines: Reason & Respond, with Think-Pair-Share**

Distribute 2-D shapes. Play the video. Using Think-Pair-Share, the children answer the questions. Along with the video, the children identify the square corners/right angles on the shapes.

C **Concrete activity: Maths Eyes**

Assessment Opportunity

Go on a 'square corner' hunt around the classroom, school or playground. Each child has a square. On their MWBs, each child draws three objects that have square corners, and three objects that do not have square corners.

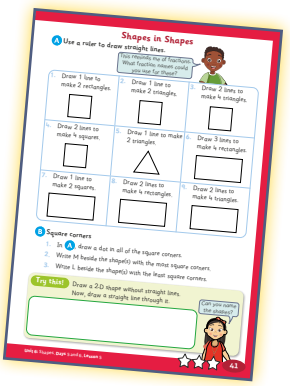
Let's strengthen

Provide sticky dots for children to put in right-angled corners of 2-D shapes.

Let's deepen

The children might be ready to use the term 'right angle'.

P **Pupil's Book page 41: Shapes in Shapes**



Optional consolidation and extension possibilities

Let's Investigate Provide cut-outs or models of triangles of varying types. Ask the children to find two triangles which, together, have a square corner.

Games Bank Play '2-D Shape Headbands'.

Day 7, Lesson 6

Naming and Sorting 3-D Shapes

Focus of learning (with Elements)

- Presents a wide range of purposes for the potential use of 3-D shapes (A&PS)
- Compares and contrasts shapes and shape families based on their properties (R)
- Sorts an increased range of shapes according to at least two properties (R)

Learning experiences

- D C Digital activity: 3-D Shapes *MAM* Routines: Reason & Respond, with Think-Pair-Share
- C Concrete activity: Same-But-Different Challenge
- P Pupil's Book page 42: Naming and Sorting 3-D Shapes

Equipment

- 3-D shapes in different sizes and colours: cube, cuboid, sphere, cylinder, cone
- Real-life 3-D shapes (e.g. balls, beads, packaging)
- 1–6 spinners

Maths language

- There is no new maths language for this lesson.

Warm-up

D C Digital activity: 3-D Shapes *MAM* Routines: Reason & Respond, with Think-Pair-Share

The children need concrete examples of cubes, cuboids, cylinders, cones and spheres.

Play the slideshow, one slide at a time. For each slide, ask the children to pick out the relevant shape from their concrete selection. The children then name each shape. The last image is new to 1st Class – the cone.

For each slide, ask:

- Where else might you see this shape?
- Can you see this shape in the classroom?
- Can it roll? Prove it!
- Can it slide? Prove it!
- Can it stack? Prove it!

Assessment Opportunity

Teacher note: A cone can stack once onto another shape or surface, but cannot have another item stacked onto it, unlike a cube, cuboid or cylinder.

Main event

C Concrete activity: Same-But-Different Challenge

The children work in pairs or small groups. They need a 1–6 spinner and examples of 3-D shapes in different sizes and colours. Include real-life shapes (e.g. balls, beads, packaging).

The children take turns to spin the spinner and find two or more shapes for which they can name and discuss that number of similarities/differences in the properties (including roll, stack, slide).

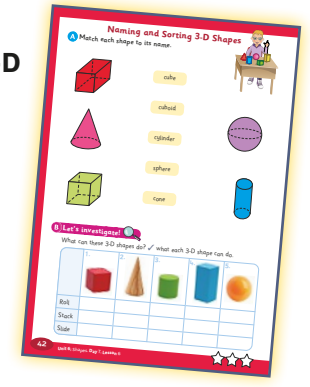
Let's strengthen

The children can focus on finding one or two similarities and differences.

Let's deepen

The children can include finding similar real-life examples of the shapes.

P Pupil's Book page 42: Naming and Sorting 3-D Shapes



Optional consolidation and extension possibilities

Investigation Station Free-play with building blocks of different shapes and sizes.

Which One Doesn't Belong? The children work in pairs or small groups and use their MWBs to play their own version of 'Which One Doesn't Belong?' Set these ground rules: (1) Only three shapes are allowed; (2) There can be more than one answer; (3) The answer cannot be changed once the round has begun.

Printing Station At the Printing Station, the children print the faces of 3-D shapes. Alternatively, you could set up a station for deconstructing and reconstructing 3-D shapes.

Investigation Station Provide a deconstructed 3-D shape and ask the children to reconstruct it. 'Forget' to give them one piece.

Day 8, Lesson 7

3-D Shapes: Faces, Surfaces, Edges and Corners

Focus of learning (with Elements)

- Compares properties (faces, sides, corners, vertices) of shapes (U&C)
- Describes the key differences and similarities of shapes according to their properties (C)

Learning experiences

- (D) Digital activity: Faces, Edges and Corners *MAM* Routines: Notice & Wonder; Reason & Respond, with Think-Pair-Share
- (P) Pupil's Book page 43: 3-D Shapes: Faces, Surfaces, Edges and Corners

Equipment

- 3-D shapes including real-life examples (e.g. balls, beads, packaging)

Maths language

- There is no new maths language for this lesson.

Warm-up

(D) **Digital activity: Faces, Edges and Corners**
***MAM* Routine: Notice & Wonder**

Display the poster and ask:

- What do you notice?
- What do you wonder?

Record the children's responses to both questions on the board. Allow the children the opportunity to respond to (agree/disagree with or query) others' responses, but do not confirm or reject any of the ideas. Note any 'wonderings' that could become the basis for a subsequent maths investigation.

Main event

(D) (C) **Digital activity: Faces, Edges and Corners**
***MAM* Routines: Reason & Respond, with Think-Pair-Share**

Ensure the children have a selection of 3-D shapes to hand, including real-life examples (e.g. balls, beads, packaging). Display the poster. Using Think-Pair-Share, click to play or ask:

Assessment Opportunity

- Which objects have the same shape?
- Which shape has no flat face?
- Which shapes have 8 vertices or corners?
- Which shapes have a curved and a flat face?
- Which shapes have straight edges only?
- Which shapes can roll? Why?
- Which shapes can slide? Why?
- Which shapes can stack? Why?
- Which shapes have no corners?
- Can you name three shapes that you can see in the classroom?

You can also ask the following questions:

- Are there shapes that are the same or similar in the poster?
- How are they the same?
- How are they different?
- What maths words do you think of when looking at this poster?

If not mentioned by the children, ask (using the cuboid as an example):

- Do you know the name of these parts of the cuboid? (faces)
- Find an example of a cuboid on your table. Count the faces. How many are there?

Repeat, identifying and counting the faces of the various shapes. Do this again for the edges and corners.

Teaching tip

Use 'corner' and 'vertex' interchangeably, if your class is ready.

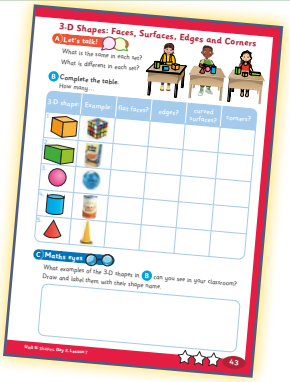
Let's strengthen

The children can focus on one property of a shape.

Let's deepen

Some children will be ready to use the terms 'vertex' and 'vertices'.

(P) **Pupil's Book page 43: 3-D Shapes: Faces, Surfaces, Edges and Corners**



Optional consolidation and extension possibilities

My Maths Fact File Complete page 126 of the Pupil's Book at any stage after this lesson.

Games Bank Play 'Gatekeeper'.

Day 9, Lesson 8

Building with 3-D Shapes

Focus of learning (with Elements)

- Deconstructs and reconstructs everyday items (for example: using containers or packaging) (A&PS)
- Compares properties (faces, sides, corners, vertices) of shapes (U&C)
- Models 2-D and 3-D shapes using materials or through drawing (U&C)

Learning experiences

(D) Digital activity: What Shape Comes Next?
MAM **Routines: Reason & Respond, with Think-Pair-Share**

(C) Concrete activity: Stations

(P) Pupil's Book page 44: Building with 3-D Shapes

Equipment

- 2-D shapes and 3-D shapes (including small real-life examples such as dice, Rubik's cubes, beads, balls)
- Opaque bag
- 0–9 spinner
- 1–6 spinner
- Counters
- PCM 28

Maths language

- There is no new maths language for this lesson.

Warm-up

D Digital activity: What Shape Comes Next?
***MAM* Routines: Reason & Respond, with Think-Pair-Share**

Play the slideshow, pausing on each slide to elicit answers from the children, who will decide what shape comes next in each pattern. Extend the activity by asking the children to copy each pattern onto their MWBs, and incorporating colour patterns.

Main event

C Concrete activity: Stations

Station 1: 3-D Challenge

Assessment Opportunity

The children work individually and/or in pairs to complete the building tasks. Use the prompt cards below.

Work in pairs. Build with three cubes and a cuboid. Get different results.	Use cubes or cuboids to build a rectangular base.
Use cubes or cuboids to build a square base.	Use cubes or cuboids to build a tower with a rectangular window.
Use cubes or cuboids to build a tower with a square window.	Use cubes or cuboids to build a tower that is wider than it is tall.
Use cubes or cuboids to build a tower that is taller than it is wide.	Use cubes or cuboids to build a tower with six sides.
Use cubes or cuboids to build a tower, inside which you will place three small spheres, one on top of the other.	Work in pairs. Build with cubes, cuboids, cylinders and cones. Get different results.
Work in pairs. Build with six cubes, a cuboid, a cone and a cylinder. Get different results.	Work in pairs. Build with three cylinders, a cone and a cuboid. Get different results.

Station 2: Spin and Build

Working in pairs, the children spin the 0–9 spinner twice. They add the numbers to find the total. Each child builds a different structure using that number of 3-D shapes.

Station 3: Pick from the Mix

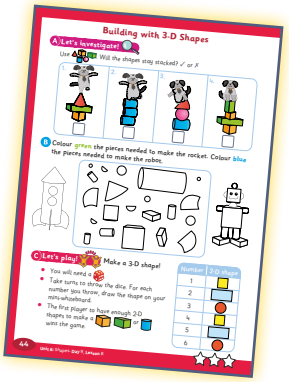
The children need a 1–6 spinner; an opaque bag containing a mixture of 2-D and 3-D shapes of different colours and sizes, and some real-life items (e.g. dice, Rubik's cubes, small balls, beads).

- Each child blind-picks two items from the bag, and then spins the spinner.
- 1 = Score 1 point if the colours match.
- 2 = Score 2 points if both are 2-D shapes or both are 3-D shapes (e.g. a triangle and a square, or a cube and a cone).
- 3 = Score 3 points if both shapes have edges.
- 4 = Score 4 points if the shapes have a matching face (e.g. both have a square face).
- 5 = Score 5 points if the shapes match (e.g. both are cubes – the colour and size do not matter).
- 6 = Spin again!
- Return the items to the bag. Collect a counter for each point. When time is up, the player with the most counters wins the game.

Station 4: Shape Bingo

See PCM 28: 3-D Shape Bingo. The children play in pairs or small groups. Each player draws six 3-D shapes on their card. Taking turns, they spin the spinner and cross out the shape for that number on their card. The first player to cross out all of their shapes wins the game.

Pupil's Book page 44: Building with 3-D Shapes



Optional consolidation and extension possibilities

Maths Journal Draw pictures of the structures built in Station 1.

Investigation Station Make patterns using 3-D shapes.

Home/School Links Book Page 17 can be completed at any stage after this lesson.

Day 10, Lesson 9

Review and Reflect

Focus of learning (with Elements)

- Reviews and reflects on learning (U&C)

Warm-up

Carry out a warm-up activity of your choice from one of the lessons in this unit.

Main event

Use this menu of activity ideas to choose how best to structure this last lesson of the unit to suit your needs and the needs of your class.

Let's talk!	Let's play!
Review and Reflect Poster: Use Think-Pair-Share alongside the prompt questions to review the unit.	Model this activity with one child. The child secretly puts a shape in a sensory bag. You try to work out which shape is in the bag using exaggerated movements and holding the bag up so that the children can see it. Use touch, and describe aloud. Say, for example: • I think it is a shape with a flat surface because my hand is not curving as I touch it. • I feel corners – let me count them. • I'm checking now if all the surfaces are the same shape, etc. The children work in pairs or small groups. Distribute a sensory bag and a set of small 3-D shapes to each pair or group. One child places a 3-D shape into the bag without the others seeing. Another child closes their eyes and identifies the shape by touch. Encourage the children to use the following key terms: *corner*, *edge*, *curved*, *flat*, *face*, *surface*, *point*, *tip*.

Maths language	Let's investigate!
Ask the children to explain key terms (perhaps using examples or drawings on their MWBs). Choose the terms your class might still need to consolidate, e.g. cuboid, corners/vertices, curved, straight, roll, stack, surface, straight, line, flat. Ask the children to sketch and show an example of a shape or shape property. Challenge them to give a real-life example of the shape. Ask: • Have you something of this shape in your bedroom/car/garden? Use the Unit 6 Maths Language Cards to revise the key terms. For example: if the image and text are cut apart, can the children match them?	Are shapes really all around us? Distribute copies of PCM 29: 2-D Shape Reference Guide and PCM 30: 3-D Shape Reference Guide, and a clipboard to each child. The children work in pairs or small groups and go on a nature shape hunt (an indoor shape hunt would also work). Encourage the children to focus on key vocabulary and concepts during the task.
Progress Assessment Booklet	**Maths Eyes**
Complete Questions 24–26 on pages 14–15. Alternatively, these can be left to do as part of a bigger review during the next review week.	In pairs or small groups (indoors or outdoors) the children play 'Shape I Spy'.
Let's strengthen	**Let's deepen**
Identify children who might benefit from extra practice with some of the key concepts or skills in this unit. Use the Unit 6 Let's Strengthen PCM. Consult the Unit 6 Let's Strengthen Suggestions for Teachers.	Use the Unit 6 Let's Deepen PCM.

Notes