Maths and Me: Senior Infants – Short-Term Plan, Unit 6: Shape (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 explore and recognise properties of 3-D and 2-D shapes.

Lesson	Focus of Learning (with Elements)	CM	Learning Experiences	Assessment
1	**Shapes:** Selects appropriate criteria for shape sorting (R); Explains how shapes have been sorted (R)		(D) Notice & Wonder L1, 3 (D) Reason & Respond L1–7 (D) Think-Pair-Share L1, 3 (C) Build it; Sketch it; Write it L1 (D) Write-Hide-Show L2, 4–7 (D) Shapes Are Everywhere L2 (C) Building a Tower with 3-D Shapes L4 (D) Concept Cartoon L2, 5 (D) Three-Act Task L6 (C) Building Shapes L6 (C) Sensory ('Feely') Bag L6 (C) Shape Hunt L7 (P) Game: I Spy L7 (D) Would This Work? L7 **Print resources** Pupil's Book pages 31–36 Home/School Links Book pages 16–17 PCMs 1, 15–19	**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:** Identifies and describes the properties of 2-D shapes, including the number of sides and corners (U&C); Sorts, compares and classifies 2-D shapes into logical categories according to their attributes, size and geometric properties (R)			
3	**Sorting 2-D Shapes:** Sorts using simple Venn and Carroll diagrams (C); Compares and sorts common 2-D shapes (C)			
4	**3-D Shapes:** Discusses similarities and differences between shapes (C); Recognises and names common 3-D and 2-D shapes in different orientation and sizes (U&C)			
5	**Properties of 3-D Shapes:** Identifies and describes simple properties and capabilities of some regular shapes (U&C); Discusses similarities and differences between shapes (C)			
6	**Making 2-D and 3-D Shapes:** Selects appropriate materials to represent shapes (C); Solves tasks and problems involving shapes (A&PS)			
7	**Shapes Around Us:** Sorts, compares and classifies 2-D and 3-D objects into logical categories according to their attributes, size and geometric properties (R); Asks questions about the properties of shapes to determine their identity (C); Solves tasks and problems involving regular shapes (A&PS)			
8	**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 'Senior Infants *Maths and Me* Progression Continua Overview' for a detailed breakdown of how all progression continua are covered.
Maths Language	See 'Senior Infants *Maths and Me* Maths Language Overview', individual lesson plans and Unit 6 Maths Language Cards.
Equipment	See 'Senior Infants *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 Senior Infants. It is designed to revise and develop the content of Shape in *Maths and Me* for Junior Infants, as well as prepare the children to apply their understanding to Transformation, Spatial Awareness and Location, which are combined in Unit 9 Location and Transformation. The overarching theme of The City provides a meaningful context for shape, and encourages the children to develop their Maths Eyes as they appreciate and make connections with the shapes in their environment.
- During each lesson in this unit, when discussing/naming shapes, the teacher can question the children about why a certain shape is a square/cube/circle. For example: 'How do you know it is a sphere? Prove it!'
- Rectangle: In *Maths and Me*, we want to move away from the description of a rectangle as two long sides and two short sides, which causes confusion later when children learn that a square is a type of rectangle. It is more accurate to describe a rectangle as a four-sided shape where the opposite sides are equal.
- 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 its 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.
- 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).

The theme of this unit is **The City**.

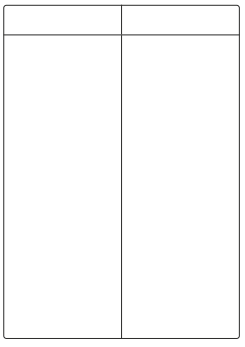
Common misconceptions and difficulties

- The children may confuse and/or misname 2-D and 3-D shapes, generally and specifically. For example: confuse circle and sphere because the drawn representation of a sphere is a circle; confuse cube with cuboid as they sound similar; confuse cylinder with sphere as they both start with a soft 'c' sound, etc.
- The children may use a common object to refer to a shape rather than the name of the shape (e.g. 'ball' instead of sphere).
- The children may incorrectly assume that a rotated version of the shape is a different shape, e.g. that a rotated square is now a 'diamond', a rotated triangle is now an 'arrow'.
- They may confuse key language (e.g. faces, corners, edges, sides).
- They may miscount the number of edges, sides, corners or faces. Encourage them to develop a systematic way of doing this.
- The children may incorrectly assume that all of the surfaces of any 3-D shape are faces – whereas, strictly, a face is a flat surface. (For example, the children may not recognise that a sphere has no faces, only one curved surface; and a cylinder has two faces and one curved surface.) The children will benefit from the additional experiences of printing with the 3-D shapes and/or pushing 3-D shapes into sand and/or play dough to see the imprints created. Show the children how the curved surfaces of the 3-D shapes do not create clear prints/imprints like those of the faces.
- For the children to be able to flexibly visualise shapes, they must get plenty of experience manipulating the physical representations. Therefore, experiences with concrete materials and equipment are vital and should happen as often as possible.
- The children may also benefit from PCM 18: 2-D Shape Reference Guide and PCM 19: 3-D Shape Reference Guide. These guides to the basic shapes include their names, features and representations in various orientations. The children can use these PCMs to help them identify specific shapes and they should keep them handy throughout the entire unit. As the children gain confidence, encourage them to become less reliant on the reference guides.

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
- Various construction materials from which shapes can be made
- Sorting circles
- Venn diagrams
- Carroll diagrams



Carroll diagram

Teaching tip

2-D Shapes, Sorting Circles and Carroll Diagram 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

Shapes

Focus of learning (with Elements)

- Selects appropriate criteria for shape sorting (R)
- Explains how shapes have been sorted (R)

Learning experiences

- D Digital activity: The City *MAM* Routines: Notice & Wonder; Reason & Respond, with Think-Pair-Share
- C Sorting activity: Sorting Shapes
  MAM Routine: Reason & Respond
- C Concrete activity: Building a City
  MAM Routine: Build it; Sketch it; Write it

Equipment

- All available 2-D and 3-D equipment, including wooden building blocks, magnetic blocks, polydrons, tangrams, pattern blocks, geostrips, attribute blocks, materials from classroom/home
- Sorting circles
- PCM 15

Maths language

- Focus on the children's own maths language to describe shapes (prior knowledge).

Warm-up

D Digital activity: The City
MAM Routine: Notice & Wonder

Display the poster and click to play or ask:

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

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.

Teaching tip

The children do not need to name all of the 2-D and 3-D shapes. The purpose is to find out what they may know already.

Main event

D Digital activity: The City *MAM* Routines: Reason & Respond, with Think-Pair-Share

Display the poster again and click to play or ask:

- What shapes can you see? Can you name them?
- What shapes make up the sun?
- What shape is the window of the van?
- What shape is the orange building?
- What shape is the roof of the café?
- What shape is the pink building?
- What shape is the church window?
- How many triangles can you see?
- How many squares can you see?
- Are any of the shapes like some shapes you know?

C Sorting activity: Sorting Shapes
MAM Routine: Reason & Respond

Assessment Opportunity

Use this activity to establish the children's prior knowledge of shapes from Junior Infants. Provide them with concrete 2-D shapes (or use the 2-D shapes from PCM 15, printed on card), 3-D shapes and sorting circles. Ask them to sort the shapes as they wish (according to their own criteria). When they have completed the task, ask:

- How have you organised the shapes?
- Why did you do it this way?
- What is the same in each group?
- What is different about the groups?
- How many different ways can you sort your collection?

Let's deepen

Challenge some children to sort their shapes again (or another set, if available) according to different criteria.

C Concrete activity: Building a City
***MAM* Routine: Build it; Sketch it; Write it**

Ask the children to work in small groups and to use any available resources to build a scene of a city (or a village/town). The children could include representations of 2-D and 3-D shapes found in the classroom (e.g. a lunch box, a pencil case, a toilet roll). Expand and continue this activity throughout the unit as a STEM project, if you wish.

Optional consolidation and extension possibilities

Integration Geography: Buildings, traffic, travel. Language: Gaeilge: Ag siopadóireacht.

Shape Display Set up a Shape display in the classroom. Include various 2-D and 3-D real-life shapes, as well as appropriate labels (see Unit 6 Maths Language Cards). The children could contribute samples of their own work from this lesson and label them.

Visual Arts Set up a printing table for shape-printing activities.

Play Constructive play: Use construction materials to create buildings or a street scene.

STEM Project Design and Make a City (Village/Town): Use the design-and-make process of explore, plan, make and evaluate.

- In Lesson 1, the children simply explore the materials and imagine them as buildings.
- In Lessons 2 and 3, they draw their plan, using 2-D shapes as representations.
- In Lessons 4–6, they build their model.
- In Lesson 7, they evaluate their model.

Day 2, Lesson 2

Properties of 2-D Shapes

Focus of learning (with Elements)

- Identifies and describes the properties of 2-D shapes, including the number of sides and corners (U&C)
- Sorts, compares and classifies 2-D shapes into logical categories according to their attributes, size and geometric properties (R)

Learning experiences

- D Animation: Shapes Are Everywhere
  ***MAM* Routine: Reason & Respond**
- D Digital activity: Same But Different – Shapes (1)
  ***MAM* Routine: Reason & Respond**
- D Digital activity: Agree or Disagree?
  ***MAM* Routine: Concept Cartoon**
- C Sorting activity: Sorting Shapes
  ***MAM* Routines: Reason & Respond, with Write-Hide-Show**
- P Pupil's Book page 31: Properties of 2-D Shapes

Equipment

- All available 2-D and 3-D equipment, including wooden building blocks, magnetic blocks, polydrons, tangrams, pattern blocks, geostrips, attribute blocks, materials from classroom/home
- Sorting circles

Maths language

- square, circle, rectangle, triangle, side, corner, curved, straight, opposite

Warm-up

D **Animation: Shapes Are Everywhere**
***MAM* Routine: Reason & Respond**

Play the animation, which explores the properties of 2-D shapes. Encourage the children to name and discuss the shapes.

Main event

D **Digital activity: Same But Different – Shapes (1)**
***MAM* Routine: Reason & Respond**

Play the slideshow, in which each slide has two sets of 2-D shapes. For each slide, ask:

- What is the same?
- What is different?

D **Digital activity: Agree or Disagree?**
***MAM* Routine: Concept Cartoon**

Display the Concept Cartoon, in which the characters describe a set of shapes using the following statements:

Assessment Opportunity

- 'A square has only three sides.'
- 'A circle has one curved side.'
- 'All triangles look the same.'
- 'A rectangle has five corners.'

Ask the children whether they agree or disagree with each statement. They can record their responses on their MWBs. Ask them to give reasons why.

C **Sorting activity: Sorting Shapes *MAM* Routines: Reason & Respond, with Write-Hide-Show**

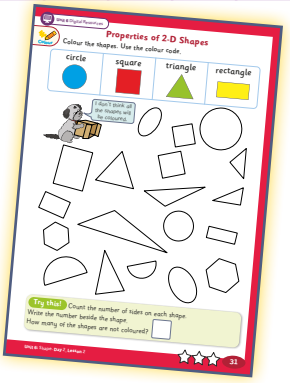
Distribute a set of attribute blocks and sorting circles to each group. Ask them to sort the shapes as they wish (according to their own criteria). When they have completed the task, ask:

- How have you organised the shapes?
- Why did you do it this way?
- What is the same in each group?
- What is different about the groups?
- Could you have sorted them differently? How?

Let's strengthen

The children will benefit from the additional support of PCM 18: 2-D Shape Reference Guide. This guide to the basic 2-D shapes includes their names and representations in various orientations. The children can use this PCM to help them identify specific shapes and they should keep the guide handy throughout the entire unit. As the children gain confidence, encourage them to become less reliant on the reference guide.

P **Pupil's Book page 31: Properties of 2-D Shapes**



Teaching tip

Encourage the children to think about whether changing the size or orientation of a shape changes the shape itself.

Let's strengthen

Some children may need attribute blocks to assess whether the orientation of a shape changes the shape.

Let's deepen

Discuss the shapes that were not coloured in.

Optional consolidation and extension possibilities

Integration Geography: Buildings, traffic, travel. Language: Gaeilge: Ag siopadóireacht.

Shape Display Set up a Shape display in the classroom. Include various 2-D and 3-D real-life shapes, as well as appropriate labels (see Unit 6 Maths Language Cards). The children could contribute samples of their own work from this lesson and label them.

Story Read *Mouse Shapes* by Ellen Stoll Walsh, or listen to a reading at: edco.ie/dy5u

Patterns Carry out pattern-building activities with 2-D shapes.

Visual Arts Create artwork using pre-cut shapes.

STEM Project The children draw their plan, using 2-D shapes as representations.

Day 3, Lesson 3

Sorting 2-D Shapes

Focus of learning (with Elements)

- Sorts using simple Venn and Carroll diagrams (C)
- Compares and sorts common 2-D shapes (C)

Learning experiences

- (D) Digital activity: The Art Gallery ***MAM* Routines: Notice & Wonder; Reason & Respond, with Think-Pair-Share**
- (C) Sorting activity: Sorting Shapes
  ***MAM* Routine: Reason & Respond**
- (D) Digital activity: Sort the Shapes
  ***MAM* Routine: Reason & Respond**
- (P) Pupil's Book page 32: Sorting 2-D Shapes

Equipment

- All available 2-D and 3-D equipment, including wooden building blocks, magnetic blocks, polydrons, tangrams, pattern blocks, geostrips, attribute blocks, materials from classroom/home
- Sorting circles
- Scissors
- Glue
- PCM 1

Maths language

- Venn diagram, Carroll diagram

Warm-up

(D) Digital activity: The Art Gallery
***MAM* Routine: Notice & Wonder**

Display the poster, which shows a gallery with artwork framed in various 2-D shapes. Click to play or ask:

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

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) Digital activity: The Art Gallery *MAM* Routines: Reason & Respond, with Think-Pair-Share

Using Think-Pair-Share to collect feedback, click to play or ask:

- What 2-D shapes can you see?
- What shape is Lexi looking at in the painting?
- What shape is the rug that Jay is sitting on?
- What shape is the cushion that Mia is sitting on?
- What shape is the doorway that Monty is in?
- What shape is Dara looking at in the painting?
- What shapes can you see on the tiles?
- What shape is the green sign on the wall?
- What shape is the man holding?
- Are there any shapes that you do not know the name of?

(C) Sorting activity: Sorting Shapes
***MAM* Routine: Reason & Respond**

Distribute two sorting circles and a collection of 2-D shapes to each group.

Sort 1: The sorting circles overlap like a two-ring Venn diagram. Ask the children to sort the shapes according to the following criteria: (1) has curved sides; (2) has straight sides; (3) has both curved and straight sides.

Sort 2: The sorting circles do not overlap. Ask the children to sort the shapes according to the following criteria: (1) has three sides; (2) has four sides.

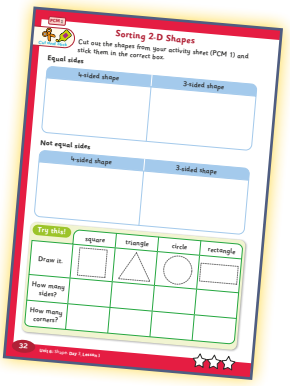
D Digital activity: Sort the Shapes
***MAM* Routine: Reason & Respond**

This can be carried out as a whole-class activity or in stations, with each group working directly with the interactive tool. Ask the children to sort the 2-D shapes and to discuss their reasoning.

Assessment Opportunity

P Pupil's Book page 32: Sorting 2-D Shapes

Cut and Stick: Distribute scissors, glue and a copy of PCM 1 Sorting 2-D Shapes to each child.



Optional consolidation and extension possibilities

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

Maths Journal The children draw any shape that they know and describe it using the vocabulary they have used and have on the Maths Language Cards.

Patterns Carry out pattern-building activities with 2-D shapes.

Visual Arts Create artwork using pre-cut shapes or tangrams.

STEM Project The children continue working on their plan, using 2-D shapes as representations.

Collaborative Art As an alternative to the STEM project, the children could work in groups to design a collaborative street scene. Distribute a large sheet of paper, scissors, glue and copies of PCM 15: 2-D Shapes to each group. The children colour, cut and paste the 2-D shapes onto the sheet of paper.

Day 4, Lesson 4

3-D Shapes

Focus of learning (with Elements)

- Discusses similarities and differences between shapes (C)
- Recognises and names common 3-D and 2-D shapes in different orientation and sizes (U&C)

Learning experiences

- D Digital activity: What Shape Am I? ***MAM* Routines: Reason & Respond, with Write-Hide-Show**
- C Sorting activity: Sorting Shapes
  ***MAM* Routine: Reason & Respond**
- D Digital activity: Slow Shape Reveal (1)
  ***MAM* Routines: Reason & Respond, with Write-Hide-Show**
- C Concrete activity: Building a Tower with 3-D Shapes
- P Pupil's Book page 33: 3-D Shapes

Equipment

- All available 2-D and 3-D equipment, including wooden building blocks, magnetic blocks, polydrons, tangrams, pattern blocks, geostrips, attribute blocks, materials from classroom/home
- Sorting circles
- Counting supports such as bears, rekenreks or ten frames

Maths language

- cube, cylinder, cuboid, sphere

Warm-up

D Digital activity: What Shape Am I? ***MAM* Routines: Reason & Respond, with Write-Hide-Show**

Play the slideshow, in which the children guess the hidden shape. Click the audio buttons to hear clues as to what the hidden shape might be. Give the children time to record their ideas and responses on their MWBs. Continue to provide the children with clues, via the audio buttons, until they can answer the question: *What shape am I?* Then click to flip the card and reveal the shape.

Main event

C Sorting activity: Sorting Shapes
***MAM* Routine: Reason & Respond**

Distribute two sorting circles and a collection of 3-D shapes to each group. The children sort the shapes according to their own choice of criteria. Ask:

- How have you organised the shapes?
- Why did you do it this way?
- What is the same in each group?
- What is different about the groups?
- Could you have sorted them differently? How?

Challenge some children to sort their shapes again (or another set, if available), according to different criteria.

D Digital activity: Slow Shape Reveal (1)
***MAM* Routines: Reason & Respond, with Write-Hide-Show**

Distribute sets of 3-D shapes to the class. Open the activity, in which various shapes are slowly revealed. Ask the children to work out what each shape is, using the 3-D shapes on their table. They then sketch the shape on their MWBs. If, as the shape is revealed further, a child wishes to change their mind, they can draw their new shape. They justify why they changed their mind.

Assessment Opportunity

C Concrete activity: Building a Tower with 3-D Shapes

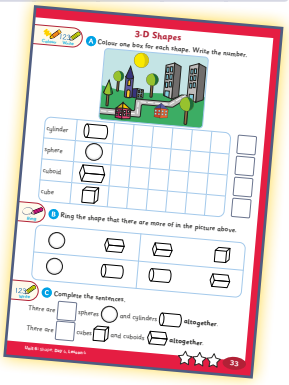
Distribute sets of 3-D shapes to the class (a variety of sizes within the sets is preferable, if possible). In pairs or groups, the children build the tallest tower they can, using their 3-D shapes. When they have completed the task, ask:

- Which shape did you use as the base?
- Did any group try a different shape for the base? Did it work?
- Did any group need to change their mind with their choice of shape? Why?
- Which was the trickiest shape to use? Why?
- Do you think builders would use this shape often? Why or why not?
- Where might this shape be useful?

Teaching tip

Draw attention to the orientation and size of different shapes in the tower. Does it matter what orientation/size we use? Does it change the name of the shape?

P Pupil's Book page 33: 3-D Shapes



Encourage the children to use counting supports such as bears, a rekenrek or a ten frame.

Optional consolidation and extension possibilities

Visual Arts Set up a printing table for printing with 3-D shapes. Given a 2-D pattern, what 3-D shapes could be used to print the rest of the pattern?

Sensory ('Feely') Bag Use a sensory bag and mini 3-D shapes to reinforce ways to identify 3-D shapes: 'It could be a ... because I feel a ...'

Patterns Carry out pattern-building activities with 3-D shapes.

STEM Project The children start building their model. They explore what 3-D shapes would be useful in the construction, and revise their plan if needed.

Maths Journal Draw a 3-D shape. Discuss: Is this easier or harder than drawing a 2-D shape?

Day 5, Lesson 5

Properties of 3-D Shapes

Focus of learning (with Elements)

- Identifies and describes simple properties and capabilities of some regular shapes (U&C)
- Discusses similarities and differences between shapes (C)

Learning experiences

- (D) Digital activity: What Comes Next? (1)
  ***MAM* Routines: Reason & Respond, with Write-Hide-Show**
- (C) Sorting activity: Sorting Shapes
  ***MAM* Routine: Reason & Respond**
- (D) Digital activity: Slow Shape Reveal (2)
  ***MAM* Routines: Reason & Respond, with Write-Hide-Show**
- (D) Digital activity: Tower Building ***MAM* Routine: Concept Cartoon**
- (P) Pupil's Book page 34: Properties of 3-D Shapes

Equipment

- All available 2-D and 3-D equipment, including wooden building blocks, magnetic blocks, polydrons, tangrams, pattern blocks, geostrips, attribute blocks, materials from classroom/home
- Sorting circles

Maths language

- face, side, corner, roll, stack, slide, round, flat, surface, edge

Warm-up

(D) Digital activity: What Comes Next? (1)
***MAM* Routines: Reason & Respond, with Write-Hide-Show**

Play the interactive game, in which children must select the shape that comes next in the pattern. If this is done as a whole-class activity on the IWB, ask the children to sketch the shape on their MWBs.

Main event

(C) Sorting activity: Sorting Shapes
***MAM* Routine: Reason & Respond**

Distribute two sorting circles and a collection of 3-D shapes to each group.

Assessment Opportunity

Sort 1: The sorting circles overlap like a two-ring Venn diagram. Ask the children to sort the shapes according to the following criteria: (1) has a flat face; (2) has a curved face; (3) has a curved and a flat face.

Sort 2: The sorting circles overlap like a two-ring Venn diagram. Ask the children to sort the shapes according to the following criteria: (1) will roll; (2) will stack; (3) will stack and roll.

Sort 3: The sorting circles do not overlap. Ask the children to sort the shapes according to the following criteria: (1) has edges; (2) has no edges.

Teaching tip

The children may use the word 'side' for the edge of a 3-D shape. While at Senior Infants, we're not telling them they are wrong, we can revoice it using 'edge' instead. If a child uses the word 'edge', draw attention to this excellent use of maths language.

(D) Digital activity: Slow Shape Reveal (2)
***MAM* Routines: Reason & Respond, with Write-Hide-Show**

Distribute sets of 3-D shapes to the class. Open the digital activity, in which various 3-D shapes are slowly revealed. The shapes are not always in the traditional orientation. Ask the children to work out what each shape is, using the 3-D shapes on their table. They then sketch the shape on their MWBs. If, as the shape is revealed further, a child wishes to change their mind, they can draw their new shape. They justify why they changed their mind.

D Digital activity: Tower Building
***MAM* Routine: Concept Cartoon**

Following on from the children's attempts at tower building in Lesson 4, the *Maths and Me* characters now try to build the tallest tower. Play the Concept Cartoon in which each of the characters is holding a different shape. Each character thinks their shape will build the the tallest tower. Ask:

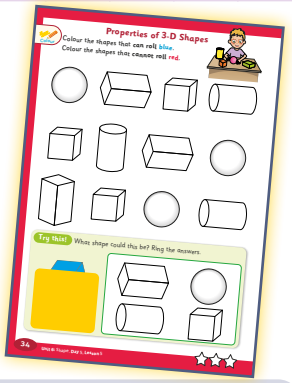
- Who do you agree with? Why?
- What properties of the shapes can tell us if he/she will succeed or not?
- Will anyone find it too difficult?
- Does anyone else have a good suggestion?
- If we gave each character only five shapes, who would build the tallest tower?

Let's strengthen

The children will benefit from the additional support of PCM 19: 3-D Shape Reference Guide. This guide to the basic 3-D shapes includes their names and representations in various orientations.

The children can use this PCM to help them identify specific shapes and should keep the guide handy throughout the entire unit. As the children gain confidence, encourage them to become less reliant on the reference guide.

P Pupil's Book page 34: Properties of 3-D Shapes



Teaching tip

In *Try this!* the children should be able to give a mathematical reason for their answer. They should also be made aware that there are two possible answers (cube and cuboid) because the properties are similar and we cannot see the entire shape.

Optional consolidation and extension possibilities

Shape Display Set up a Shape display in the classroom. Include various 2-D and 3-D real-life shapes, as well as appropriate labels (see Unit 6 Maths Language Cards). Any new language can be added to the table if you have set it up already. The children could contribute samples of their own work from this lesson and label them.

Visual Arts Set up a printing table for printing with 3-D shapes. Given a 2-D pattern, what 3-D shapes could be used to print the rest of the pattern?

Sensory ('Feely) Bag Use a sensory bag and mini 3-D shapes to reinforce ways to identify 3-D shapes: 'It could be a ... because I feel a ...'

Patterns Carry out pattern-building activities with 3-D shapes.

STEM Project The children continue building their model.

Games Bank Play 'The Gate Game'.

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

Days 6 and 7, Lesson 6

Making 2-D and 3-D Shapes

Focus of learning (with Elements)

- Selects appropriate materials to represent shapes (C)
- Solves tasks and problems involving shapes (A&PS)

Learning experiences

- (D) Digital activity: Slow Shape Reveal (3) ***MAM* Routines: Reason & Respond, with Write-Hide-Show**
- (D) Digital activity: Which One Doesn't Belong? (6) ***MAM* Routines: Reason & Respond, with Write-Hide-Show**
- (D) Digital activity: Slippery Shapes ***MAM* Routine: Three-Act Task**
- (C) Concrete activity: Building Shapes
- (C) Concrete activity: Sensory ('Feely') Bag
- (P) Pupil's Book page 35: Making 2-D and 3-D Shapes

Equipment

- All available 2-D and 3-D equipment, including wooden building blocks, magnetic blocks, polydrons, tangrams, pattern blocks, geostrips, attribute blocks, materials from classroom/home
- Geoboards, geostrips, pegs and pegboards, lollipop sticks
- Play dough
- Scissors
- Paper
- Glue
- Small 3-D shapes
- Sensory bag made of opaque fabric and large enough to fit 3-D shapes and allow a child's hand to move around inside
- PCM 16

Maths language

- There is no new maths language for this lesson.

Warm-up

Do one of these warm-up activities on each day.

(D) **Digital activity: Slow Shape Reveal (3)**
***MAM* Routines: Reason & Respond, with Write-Hide-Show**

Distribute sets of 2-D and 3-D shapes to each group. Play the slideshow and use the slow-reveal feature. The shapes are not always in the traditional orientation. Ask the children to work out what each shape is, using the shapes on their table. They write or draw their guess on their MWBs. As they eliminate a choice, they place the shape back into the box, so that the shapes remaining on the table are the possible answers. If they wish to put a shape back on the table, they must justify why it belongs there (properties).

(D) **Digital activity: Which One Doesn't Belong? (6)**
***MAM* Routines: Reason & Respond, with Write-Hide-Show**

Play the slideshow and ask the children to suggest reasons why each of the shapes does not belong.

Main event

Choose to carry out some or all of the activities over the two days.

(D) **Digital activity: Slippery Shapes**
***MAM* Routine: Three-Act Task**

Act 1: Notice & Wonder

Play the video, in which the teacher is carrying a box of 3-D shapes back to the Maths press (cupboard) when she trips over Monty, dropping the box of shapes on the floor. Click to play or ask:

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

Reveal the focus question.

- What shape **rolled** under the press?

Assessment Opportunity

Teaching tip

There is an equal amount of each shape and colour, but do not reveal this until the children have engaged in rich discussion about what shape could be missing. (See later Teaching tip).

Act 2: Productive Struggle

Look at the image and click to play or ask:

- What shapes can we rule out/eliminate? (the shapes that cannot roll)
- What do you know? (the shapes that do roll)
- To get an answer, what needs to be done?
- How might we do this?

Once the children explain that they need to organise the shapes into ones that can roll and ones that cannot roll, click to reveal the close-up of the shapes on the floor. Then give each pair a copy of PCM 16 Slippery Shapes to work out how to find the missing shape. Ask:

- What strategy can you use to make sure all the cubes are there? (Count the cubes. How many are there?)
- What strategy can you use to work out the missing colour? (How many yellows can you see?)
- What can you do together to help answer the question? (The children might suggest sorting them by shape or by colour.)

Teaching tip

The children might suggest that there is the same amount of each shape. At this point, confirm that Monty (the puppet) has told you there is the same amount of each shape. If they don't suggest this, let them know before they move on to the Build it; Sketch it; Write it.

Using Build it; Sketch it; Write it, the children choose their preferred way to mathematically model their strategies/solution(s).

Act 3: The Big Reveal

The children share and discuss their strategies and solutions. Click to play or ask:

- What answer did you get?
- How did you get that answer?
- Was it difficult? Was it easy?

Let's strengthen

You could also ask:

- How did you know it couldn't be a cube? How many cubes are on the floor?
- How did you know it couldn't be a cuboid? How many cuboids are on the floor?
- Was there more than one possible shape that rolled?
- How many spheres are on the floor?
- How many cylinders are on the floor?

Next, click to flip the image and play the video, in which the shape that was under the press is revealed. Click to play or ask:

- Is that the answer you expected? Why or why not?
- What 'I wonder' questions did you answer?
- Do you have any new 'I wonder' questions?

C Concrete activity: Building Shapes

Distribute geoboards, geostrips, pegs and pegboards, lollipop sticks, play dough, scissors, paper and glue to the class. Ask the children what shapes they are going to make (e.g. a square, a triangle or a cube). After they have completed the task, ask:

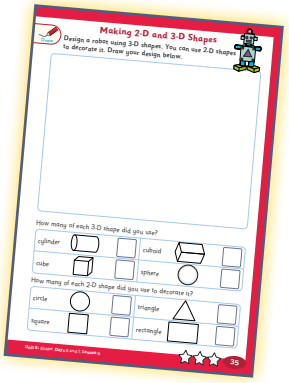
- What shape did you make? How can you prove it?

Discuss which shapes are easy to build and which are harder to build. Add the completed shapes to the Shape display. Alternatively, this activity could be done using the e-manipulatives or a geoboard app.

C Concrete activity: Sensory ('Feely') Bag

Use a sensory bag and mini 3-D shapes to reinforce ways to identify 3-D shapes: 'It could be a ... because I feel a ...'

P Pupil's Book page 35: Making 2-D and 3-D Shapes



Let's strengthen

For further support with Pupil's Book page 35, use the Unit 6 Let's Strengthen PCM.

Optional consolidation and extension possibilities

Let's Deepen Use the Unit 6 Let's Deepen PCM (1 of 2).

Visual Arts Set up a printing table for printing with 3-D shapes. Given a 2-D pattern, what 3-D shapes could be used to print the rest of the pattern?

Maths Journal The children create a 'shape person' using all of the 2-D shapes they have discussed. Add 3-D shapes if you wish.

STEM Project The children continue building their model.

Games Bank Play 'The Gate Game'.

Days 8 and 9, Lesson 7

Shapes Around Us

Focus of learning (with Elements)

- Sorts, compares and classifies 2-D and 3-D objects into logical categories according to their attributes, size and geometric properties (R)
- Asks questions about the properties of shapes to determine their identity (C)
- Solves tasks and problems involving regular shapes (A&PS)

Learning experiences

- (D) Digital activity: Same But Different – Shapes (2)
  ***MAM* Routine: Reason & Respond**
- (D) Digital activity: What Comes Next? (2)
  ***MAM* Routines: Reason & Respond, with Write-Hide-Show**
- (D) Digital activity: Sorting Slippery Shapes
  ***MAM* Routine: Would This Work?**
- (C) Concrete activity: Shape Hunt
- (P) Game: I Spy
- (P) Pupil's Book page 36: Shapes Around Us

Equipment

- All available 2-D and 3-D equipment, including wooden building blocks, magnetic blocks, polydrons, tangrams, pattern blocks, geostrips, attribute blocks, materials from classroom/home
- Spinners or dice
- Counters
- PCM 17

Maths language

- There is no new maths language for this lesson.

Warm-up

Do one of these warm-up activities on each day.

(D) Digital activity: Same But Different – Shapes (2)

***MAM* Routine: Reason & Respond**

Play the slideshow, in which each slide has two sets of either 2-D or 3-D shapes. Ask:

- What is the same?
- What is different?

(D) Digital activity: What Comes Next? (2)

***MAM* Routines: Reason & Respond, with Write-Hide-Show**

Play the complete-the-pattern activity. Ask the children what shape comes next. Can they draw the shape on their MWBs?

Main event

(D) Digital activity: Sorting Slippery Shapes

***MAM* Routine: Would This Work?**

Display the activity. Begin by distributing sets of 2-D and 3-D shapes to the class and ask the children to demonstrate how they would sort the shapes. Allow time for the children to show how they did it. Then, click to reveal the approaches of the characters. Ask:

Assessment Opportunity

- How did Dara sort the shapes?
- How did Lexi sort the shapes?
- How did Mia sort the shapes?
- How did Jay sort the shapes?

(C) Concrete activity: Shape Hunt

(Recommended for Day 8.)

Tell the children to go on a circle hunt in the classroom. They search for the biggest/smallest circle they can find. Remind the children that it might be a face on a 3-D object (e.g. a plate, a cup, a globe base). Repeat the activity with other 2-D and 3-D shapes. The children add some of the items they find to the Shape display.

Game: I Spy

(Recommended for Day 9.)

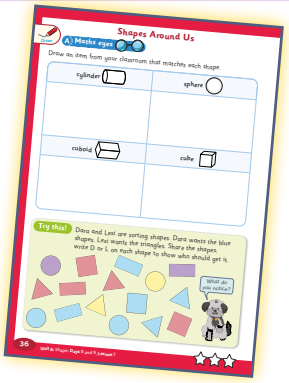
Distribute a copy of PCM 17 Shape Spinners with a paper clip for spinning to each group. When a player lands on a shape, they must give a clue about where that shape is found in the classroom. For example: For a square, 'I spy with my Maths Eyes a square shape near the library.' Discuss clues based on what is reasonable. For example:

- Jane couldn't have spied the jar because that has a 'circle face', not a square face.
- It's a circle because it has only one line.
- It's not a square because it doesn't have corners.
- Monty says: 'I don't believe you! Prove it!'

Let's strengthen

The children may also benefit from PCM 18: 2-D Shape Reference Guide and PCM 19: 3-D Shape Reference Guide. These guides to the basic shapes include their names, features and representations in various orientations. The children can use these PCMs to help them identify specific shapes and should keep them handy throughout the entire unit. As the children gain confidence, encourage them to become less reliant on the reference guides.

Pupil's Book page 36: Shapes Around Us



Note: These activities tie in with the Shape Hunt in the Main Event section.

Optional consolidation and extension possibilities

Integration Geography: Buildings, traffic, travel. Language: Gaeilge: Ag siopadóireacht.

Shape Display Set up a Shape display in the classroom. Include various 2-D and 3-D real-life shapes, as well as appropriate labels (see Unit 6 Maths Language Cards). The children could contribute samples of their own work from this lesson and label them.

Story Read *Kitten Castle* by Mel Friedman and Ellen Weiss. A reading is available at: edco.ie/eerd

Visual Arts Set up a printing table for printing with 3-D shapes. Given a 2-D pattern, what 3-D shapes could be used to print the rest of the pattern?

Patterns Carry out pattern-building activities with 3-D shapes.

STEM Project The children evaluate their model.

Day 10, Lesson 8

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

Choose from this menu of activity ideas, or choose your own way to best structure this last lesson to suit your needs and the needs of your class.

Let's talk!	Let's play!
Use Think-Pair-Share to review the unit. Groups could present their drawings/work/constructions to the rest of the class, and talk about what they have learned.	**STEM project:** Design and Make a City Street: Use this lesson to allow the children more time to complete their projects. Or this lesson could become part of the 'evaluation' phase of the design-and-make process, in which the children evaluate their project and the models they created.
Maths language	**Maths strategies and models**
• Call out a random 2-D or 3-D shape and ask the children to sketch it on their MWBs. • Use the maths language cards for this unit to revise the key terms. For example: If the image and text are cut apart, can the children match them?	Ask the children to give examples of the strategies (e.g. examining and using the concrete shapes, using Venn diagrams and Carroll diagrams to sort and classify shapes) that they used in this unit.
Progress Assessment Booklet	**Maths Eyes**
Complete Questions 23–27 on pages 14–15. Alternatively, these can be left to do as part of a bigger review during the next review week.	Go for a walk through the school and/or local area, looking for 2-D and 3-D shapes. How are they similar to/different from those looked at during this unit? Are there any buildings that are made up of more than one 3-D shape? Ask the children to make drawings or take photos to record their findings in a display when back in the classroom.
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. Consult the Unit 6 Let's Strengthen Suggestions for Teachers and/or use the Unit 6 Let's Strengthen PCM.	Use the Unit 6 Let's Deepen PCM (2 of 2).

Notes