Maths and Me: 1st Class – Short-Term Plan, Unit 3: Fractions (October: Weeks 1&2)

Strand(s) > Strand Unit(s)	Number > Fractions.
Learning Outcome(s)	Through appropriately playful and engaging learning experiences children should be able to recognise and name fractions according to their part-whole relationships; explore the concept of equivalence in terms of simple fractions; demonstrate proficiency in using and applying different counting strategies; understand that digits have different values depending on their place or position in a number; use estimation to quickly determine number values and number calculations; select, make use of and represent a range of addition and subtraction strategies.

Lesson	Focus of Learning (with Elements)	CM	Learning Experiences	Assessment
1	**Whole and Parts:** Makes explicit connections between the parts that make up one whole (U&C)		C Hokey Pokey L1 P C The Whole Pizza L1 C Reason & Respond L2, 3, 6, 7 C Role Play L2 C Build it; Sketch it; Write it L2, 5, 7 C I Do, We Do, You Do L3 D Think-Pair-Share L3, 6, 7 D Notice & Wonder L6, 7 C What Shape Am I? L4 C Fraction Stations L4 C Huggy L5 D Three-Act Task L5 C Choral Counting L6 **Print resources** Pupil's Book pages 20–25 Home/School Links Book pages 10–11 PCMs 1, 8, 12, 13, 14, 15 Unit 3 Maths Language Cards	**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 10–11
2	**A Fair Share:** Demonstrates understanding that the greater the number of portions of a whole, the smaller the size of each equal share (R)			
3	**Halves and Quarters:** Investigates halves and quarters of different geometric shapes (A&PS); Represents and records understanding of halves and quarters using manipulatives, pictorially or by using symbols (C); Explains unit fractions as one part of a whole (C)			
4	**Fraction Stations:** Represents and records understanding of halves and quarters using manipulatives, pictorially or by using symbols (C); Partitions an array of shapes into two and four equal parts (R)			
5	**Halving Sets:** Establishes and identifies half of sets up to at least 20 (U&C)			
6	**Half Price:** Establishes and identifies half of sets up to at least 20 (U&C)			
7	**Quarters of Sets:** Partitions an array of objects or a shape into four equal shares (R); Represents and records understanding of quarters using manipulatives, pictorially or by using symbols (C)			
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 '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 3 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 3 Let's Strengthen Suggestions for Teachers. (These address the Common Misconceptions and Difficulties listed below.) • See Unit 3 Let's Strengthen PCM. • See Unit 3 Let's Deepen PCM.
Integration	See individual lesson plans.

Background and rationale

- This unit is a two-week block of content for October, positioned to come after Numbers to 30, and Addition and Subtraction 1, which looked at doubles, etc.
- This chapter is specifically positioned to come before Time and 2-D Shapes. Fractioning 2-D shapes is included in this unit, using only those shapes covered to the end of Senior Infants. Partitioning and combining shapes will be further developed as part of the unit on 2-D shapes, as will Measures (halves and quarters of standardised measures) and Location and Transformation (half turns, quarter turns).
- Through playful engagement the children will focus on the part/whole concept in relation to geometric shapes and other representations of wholes and parts. They will engage with area, linear and set models (see below). The progression through the unit is from halves of shapes (with which they are familiar from Senior Infants) to quarters of shapes, and from working with sets up to at least 10, to working with sets up to at least 20. The children will understand how decomposing a shape or set into more equal parts produces parts which are smaller.
- Shopping is a task that children are familiar with from daily life, and it is where fractions and money are interconnected in a very real way. Progressively, fractions and money are interconnected in this unit, using only those denominations the children know from Senior Infants. The children will justify, represent and record their understanding using appropriate materials and language.
- The three major categories of fraction models are area model, linear model and set model. Evidence suggests that providing opportunities for students to work with all three models plays a crucial role in developing a conceptual understanding of fractions.
- **Area model:** This refers to fractions represented as parts of an area or shape, where the divisions are typically through or to the centre, in more than one direction. Examples:
  - Concrete (real objects): pie, pizza, cakes (circular, square or rectangular)
  - Concrete (manipulatives): fraction circles, pattern blocks, geoboards, tangrams, paper shapes of regular polygons, sheets of paper (e.g. paper folding)
  - Pictorial: representations of the concrete examples.
- **Linear model:** This refers to fractions represented as parts of a length, where lengths are typically horizontal and the divisions are typically vertical. Examples:
  - Concrete (real objects): ribbon, string, straws, lollipop sticks, baguette (French bread)
  - Concrete (manipulatives): fraction strips, number rods (e.g. Cuisenaire), strips of paper, connected interlocking cubes
  - Pictorial: representations of the concrete examples, plus fraction wall, number line, part–whole bar model.

- **Set model:** This refers to fractions as subsets of a whole set of objects, people, etc. Examples:
  - Concrete (real objects): people, buttons, muffins, sweets
  - Concrete (manipulatives): counters, cubes, bears, marbles
  - Pictorial: representations of the concrete examples, plus branching bonds.

The theme of this unit is **The Toy Shop**.

Common misconceptions and difficulties

While fractioning and sharing are very much a part of everyday life and language, they can often be spoken about and represented in an inaccurate or inexact way. For example, the children may use the term 'bigger half' and then justify it (e.g. the truck needs a bigger half of the road because it is bigger). Therefore, communicating, creating and representing fractions must be done as accurately as possible.

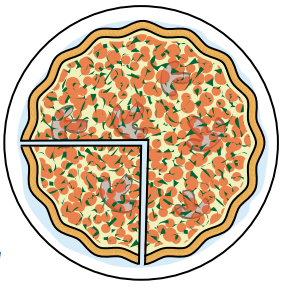
- The children may not understand the concept of equal parts.
- They may incorrectly share or divide the whole into the correct number of parts but of unequal size and label them 'half' or 'quarter'.
- They may incorrectly share or divide the whole into an incorrect number of parts.
- They may incorrectly assume that a whole or part has to be a certain size.
- They may incorrectly assume that a whole can only be one discrete object rather than a set of objects.
- They may incorrectly assume that all equal parts should look identical (have exactly the same shape, as well as size).
- They may have difficulties using the fractional notation $\frac{1}{2}$.
- They may incorrectly assume that $\frac{1}{2}$ of something is always larger than $\frac{1}{4}$ of something else.
- They may incorrectly assume that $\frac{1}{4}$ of a number is 4 because quarters are four equal parts.

The Unit 3 Let's Strengthen Suggestions for Teachers address the common misconceptions and difficulties listed above.

Mathematical models and representations

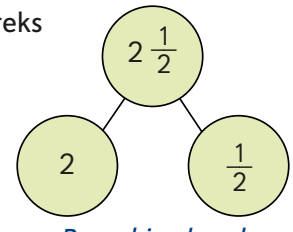
- Representations of various everyday objects (e.g. pizza, cake, sandwich)
- Diagrams of 2-D shapes, divided into various parts/fractions and/or with various parts coloured
- 2-D shapes, half shapes and quarter shapes
- Branching bonds (used to show the partitioning of mixed numbers)
- Ten frames
- Fraction number lines for comparing and ordering fractions and counting forwards and backwards in halves and quarters
- Cubes
- Number shapes
- Rekenreks

2-D shape showing half a circle

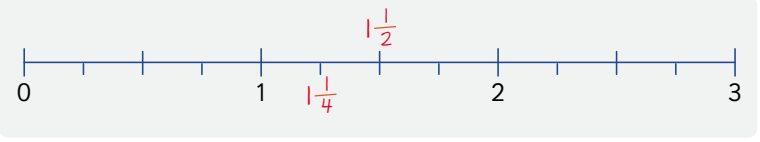


Pizza showing a quarter

Bar model



Branching bonds



Fraction number lines

Teaching tip

The following manipulative printables are available to support the unit: 2-D Shapes, Number Line 0–30, Branching Bonds, Number Shapes, Ten Frames, and Sorting Circles. Click on the resources icon on the *Maths and Me* book cover on **edcolearning.ie**

Day 1, Lesson 1

Whole and Parts

Focus of learning (with Elements)

- Makes explicit connections between the parts that make up one whole (U&C)

Learning experiences

- C Game: Hokey Pokey
- P C Game: The Whole Pizza
- P Pupil's Book page 20: Whole and Parts

Equipment

- 1–6 spinners
- PCM 12

Maths language

- share, whole, part, more than, less than

Warm-up

C Game: Hokey Pokey

Play 'Hokey Pokey', emphasising the 'whole' self. Encourage a follow-up discussion. Ask:

- What body part did we put 'in' first?
- What other body parts did we put 'in'?
- When we put 'in' all our body parts, what did we call that? (the 'whole' self)

Teaching tip

Play 'Hokey Pokey' outdoors. Draw a large circle and ask the children to stand around it. The named body part (or the 'whole' self) goes in the circle. Some children may benefit from using dolls, teddies or puppets when playing 'Hokey Pokey'.

Main event

P C Game: The Whole Pizza

Give each child a copy of PCM 12: Pizza Template. The children play in pairs or small groups. Each child cuts their paper pizza into slices. The players pool all the slices. Taking turns, each child spins the 1–6 spinner and takes that number of pizza slices. The first child to reassemble the whole pizza wins the game. The last spin must be the exact number of slices needed to finish the pizza.

Assessment Opportunity

Variations:

- Spin an even number = Miss a turn.
- Take one slice less than the number indicated on the dice.
- Assemble two pizzas to win the game.

As the children play, informally conference with them to assess their grasp of key vocabulary. Ask:

- How many parts in the whole pizza? How do you know?
- Have you won more parts or less parts of the pizza than your neighbour?
- How many more parts of the pizza do you need to make it whole?
- If you had 10 parts, would you have the whole pizza?
- Is each part of the pizza the same/equal in size?
- Is it important that the slices are the same/equal in size?
- If I give one slice to each person, between how many people could I share this pizza?

Let's strengthen

Before cutting, count the parts of the pizza. Put a counter on each part as it is counted. How many parts in the whole? Provide some children with pre-cut pizzas.

Let's deepen

Challenge the children with additional questions:

- How many parts would you need to have half the pizza?

- If you had 14 parts, would you have more or less than the whole pizza?
- How many parts in a pizza and a half?
- If twelve children share the pizza, they get one slice each. Share the pizza between six children: how many slices each?

The focus of the lesson is that a whole is made up of parts, although some children will connect that having six slices of the pizza is the same as having half.

P Pupil's Book page 20: Whole and Parts

Optional consolidation and extension possibilities

Class Display The children bring games and jigsaws from home which have 'parts' to them – or which have missing parts.

Review and Reflect Use the Prompt Questions Poster.

Maths Journal Record 'The Whole Pizza' using key words and pictures. Use the following words: first, then, next, last.

Day 2, Lesson 2

A Fair Share

Focus of learning (with Elements)

- Demonstrates understanding that the greater the number of portions of a whole, the smaller the size of each equal share (R)

Learning experiences

P C Story: *The Doorbell Rang* by Pat Hutchins
***MAM* Routine: Reason & Respond**

C Role Play: The Doorbell Rang

C Concrete activity: Let's Share!
***MAM* Routine: Build it; Sketch it; Write it**

Equipment

- *The Doorbell Rang* by Pat Hutchins
- Classroom resources such as counters, beads, marbles
- Teddies and dolls (to make up numbers in groups)

Maths language

- fair share, unfair share, altogether, next, evenly

Warm-up

P C **Story: *The Doorbell Rang* by Pat Hutchins**
***MAM* Routine: Reason & Respond**

Read the story or listen to a reading at: edco.ie/yfef, and ask the questions below. Ask the children to give reasons for their responses.

- What was this story about? What did Ma ask Victoria and Sam to do with the cookies at the beginning of the story?
- How many cookies did Victoria and Sam think they would get each? How many cookies is that altogether?

Restate to the children: 12 cookies shared between 2 means they get 6 each. Ask/say:

- That's a lot of yummy cookies each, but is it a fair share?
- What would be an unfair share?

- What happened next?
- When Victoria and Sam had to share with Tom and Hannah, did they get more cookies, less cookies or the same amount of cookies than if it was just the two of them? Why?

Restate to the children: 12 cookies shared between 2 means they get 6 each. Now, it is still 12 cookies but 4 children. Each child got 3 cookies. Ask:

- Is that a fair share? Did they get an equal number of cookies?
- What would an unfair share look like?
- Is that more cookies or less cookies than when just Victoria and Sam were sharing?

Continue in this way, working through sharing between 6 children and then 12 children.

Teacher note: *Assure the children that Ma makes super-healthy cookies with oatmeal, apples, nuts and just a few chocolate chips – although you should still never eat too many cookies!*

Teaching tip

As you work through the questions above, display the relevant page of the book on the IWB. The focus is on the diminishing size of each equal share of the cookies, as they are shared among an increasing number of children. Some children will engage with the connection between the share of the cookies and the number of cookies, e.g. that when 2 children share, they get half each. This talking point can be incorporated into the lesson. Ask:

- When 4 people share, they get less cookies each. Is that more or less than half?

Main event

C Role Play: The Doorbell Rang

Tell the children that they will act out the story *The Doorbell Rang* in groups. Elicit suggestions of healthy treats from the children (e.g. strawberries, homemade fruity ice pops). Ask:

- What will you use as the treats? (counters, cubes)
- Where will the door be? (a ruler/piece of string on the floor)
- What can you use as a doorbell? (knock on the table, clap)
- What happens first in the story?
- How many children rang the doorbell the first/next/last time?
- Did any of the visiting children ever arrive at Sam and Victoria's house on their own? (No.)
- Do you think Victoria and Sam take turns in sharing out the cookies each time visitors arrive?

Divide the children into groups of thirteen (twelve children and Ma) and distribute 12 cookies to each group. Dolls or teddies could be used to make up numbers. Some children can work in groups of six, with 6 or 12 cookies. Give the children time to decide on the role they will play. If time permits, the role play can be done again, with children playing different roles the second time.

While the children practise, circulate among the groups, checking for understanding of the key concepts. Ask:

- How many cookies altogether?
- When the cookies were shared fairly between Sam and Victoria, how many did they get each?
- When Tom and Hannah arrived, and the cookies were shared evenly, did Sam and Victoria get more cookies or less cookies than when it was just two of them? Why?
- When the cookies were shared fairly between six children, did each child get more or less than when they were shared between four children? Why?

Let's strengthen

Some children will benefit from having the story read and discussed in advance. In the role play activity, they may benefit from being part of a smaller group.

Let's deepen

Challenge the children to work out the number of cookies each person gets as the story develops. Challenge the children to explain why it is always an even number of children who ring the doorbell.

Teaching tip

Time and space may not allow for role play in your classroom. In that case, use Build it; Sketch it; Write it. Alternatively, you could divide the class into two stations: one for Role Play and one for Build it; Sketch it; Write it.

C Concrete activity: Let's Share!
***MAM* Routine: Build it; Sketch it; Write it**

Arrange the children in pairs or groups. Give each group a set of resources (e.g. marbles) to represent apples. Ask the children to represent how they might share 12 apples between 2/4/6/12 children, using at least one mathematical model in the three categories below.

- Build it! Can you use your set of marbles to represent how the apples were shared? Show us.
- Sketch it! Can you represent in a sketch how the apples were shared? Show us.
- Write it! Can you use words, branching bonds or number sentences to represent the number? Show us.

Optional consolidation and extension possibilities

Games Bank Play 'Is it a Fair Share?'

Investigation Station Set up a station using play figures, teddies, counters and cubes for children to investigate sharing.

Integration Language: Irish: Bia Slantiúil.

Concept Map Work with the children to develop a concept map on 'sharing' using words and/or pictures.

Review and Reflect Use the Prompt Questions Poster.

Day 3, Lesson 3

Halves and Quarters

Focus of learning (with Elements)

- Investigates halves and quarters of different geometric shapes (A&PS)
- Represents and records understanding of halves and quarters using manipulatives, pictorially or by using symbols (C)
- Explains unit fractions as one part of a whole (C)

Learning experiences

- D Digital activity: Which One Doesn't Belong?
  ***MAM* Routine: Reason & Respond**
- C Concrete activity: Fraction Folds ***MAM* Routine: I Do, We Do, You Do**
- D Digital activity: What is a Quarter?
  ***MAM* Routines Concept Cartoon, with Think-Pair-Share**
- P Pupil's Book page 21: Halves and Quarters

Equipment

- PCM 1

Maths language

- circle, square, rectangle, triangle, half, $\frac{1}{2}$, quarter, $\frac{1}{4}$, fold, unfold

Warm-up

D Digital activity: Which One Doesn't Belong?
***MAM* Routine: Reason & Respond**

The focus of this activity is halves and quarters. For each slide, ask the children some of the following questions and the reasons for their responses:

- What is the same?
- What is different?
- When you look at each shape, think about whole and parts. What do you see that is the same between all the shapes? What do you see that is different?
- Compare the parts of each shape. Are the parts equal?
- Which shape does not belong? Why?

- When we have a whole split into two equal parts, what do we call each part?

Write the word 'half' on the IWB and ask the children to read it. Tell them there is also a symbol of half, like there is for 'add'. Discuss this with the children:

- Instead of writing the word 'add', what symbol can I use? Write it on your MWBs.

Check the children's responses.

Tell the children that instead of writing the word 'half', it too can be written as a symbol. Write '$\frac{1}{2}$' on the IWB and ask the children to copy it onto their MWBs. Ask:

- Why do we use the numbers 1 and 2 when we write this symbol? Point to the numerator and denominator in turn as you say the numbers.

If the children do not know, explain that it is written this way because when you have half, you have *one* part out of *two*.

Ask:

- What do we call each part when a whole is split into four equal parts?
- If we have a symbol for half, should we also have a symbol for a quarter?
- If half is written as 1 over 2, because half of anything is one part out of two, how do you think the symbol for a quarter might be written?

Record the children's suggestions. If one matches the conventional symbol of $\frac{1}{4}$, draw attention to it. If not, write '$\frac{1}{4}$' on the IWB and explain that it is written this way because when you have a quarter, you have one part out of four.

Main event

C Concrete activity: Fraction Folds

***MAM* Routine: I Do, We Do, You Do**

Distribute PCM 1: Examples of Geometric Shapes and ask the children to cut out the shapes. Using I Do, We Do, You Do, show the children how to fold shapes to demonstrate halves and quarters.

I Do: Model to the children how to properly fold a shape in half, i.e. corner to corner, matching edges, creasing a fold line.

We Do:

- Work with your partner to fold each shape in half.
- Unfold and check. How many parts did the fold make? Are the parts equal?
- What symbol could you write on each equal part?
- Can you find different ways of folding the shape in half? (Invite some children to show the class the different ways of folding the shape in half.)
- Can all shapes be folded in half?

You Do:

- Can you fold each shape one more time?
- Unfold and check. How many parts are there now to the whole shape?
- Is each part equal?
- If there are four parts, and each part is equal, what is each part called?
- What symbol could you write on each equal part?
- Can you find different ways of folding the shape into quarters? (Invite some children to show the class the different ways to fold the shape into quarters.)
- Can all shapes be folded into quarters?

Conference with the children to check for understanding of the concepts of half and quarter, and the relationship between half and quarter.

Let's strengthen

Provide the children with pre-cut shapes with fold lines.

Let's deepen

Some children will be ready to make the connection between half and quarter: that two quarters make one half. Some children will be ready to make further folds and may be interested in naming related fractions.

Teaching tip

Keep the geometric shapes for use in stations later in the unit.

Teaching tip

Take photos or videos to use in the warm-up for the Review and Reflect lesson.

D Digital activity: What is a Quarter?

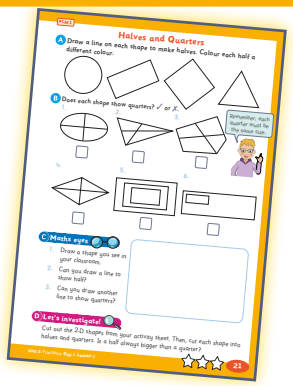
***MAM* Routines: Concept Cartoon, with Think-Pair-Share**

Display the Concept Cartoon. Click each character to hear them make a statement about what they think quarters are. Using Think-Pair-Share, ask:

Assessment Opportunity

- Do you think Dara/Mia/Lexi/Jay is correct?
- Why?
- Is he/she even a little correct in what he/she says?
- Is he/she completely correct in what he/she says?
- Can you remember which symbol is used instead of the word 'quarter'? Write it on your MWBs.

P Pupil's Book page 21: Halves and Quarters



Optional consolidation and extension possibilities

Integration STEM: Provide pegboards and geoboards for the children to experiment with halves and quarters of shapes. Art Education: Create Mondrian-style artworks using halves and quarters of shapes.

Review and Reflect Use the Prompt Questions Poster.

Home/School Links Book Page 10 can be completed at any stage after this lesson.

Days 4 and 5, Lesson 4

Fraction Stations

Focus of learning (with Elements)

- Represents and records understanding of halves and quarters using manipulatives, pictorially or by using symbols (C)
- Partitions an array of shapes into two and four equal parts (R)

Learning experiences

- C Concrete activity: What Shape Am I?
- C Concrete activity: Fraction Stations

Equipment

- Odds and ends of wool
- Glue sticks
- Scissors
- Straws
- 2-D shapes
- Pegboards
- Geoboards
- Paper
- 2-D shapes for tracing

Maths language

- fraction, sides, length, straight, corner, full-length, half-length, quarter-length

Warm-up

C Concrete activity: What Shape Am I?

This is a teacher-led activity. Provide the children with samples of all 2-D shapes: square, rectangle, circle and triangle. Images of all 2-D shapes are also shown on the IWB. Choose one 2-D shape and describe it without saying the name of the shape.

The square

- I have four sides altogether. Draw all the correct shapes on your MWBs.
- All my sides are the same length. Rub out the incorrect shapes from your MWBs.
- What shape am I?

The triangle

- I have straight sides only. Draw all the correct shapes on your MWBs.
- I have three corners. Rub out the incorrect shapes from your MWBs.
- What shape am I?

Main event

C Concrete activity: Fraction Stations

The stations give the children the opportunity to explore the linear and area models of fractions. You could set up all four stations or just one of each type (one linear and one area).

Station 1 (Linear model)
Provide the children with odds and ends of wool, glue sticks, scissors and paper. Ask the children to work in pairs to cut a length of wool that roughly measures the same as the width of their chair seat. Ask them to then find half and a quarter of that length of wool. Leave some lengths whole, cut others into halves and quarters. Repeat until they have a selection of the three lengths of wool to create wool art. This can be done freestyle, or the children can copy the examples you display on the IWB. Search online for 'wool art for children' images and choose easily copied examples such as a sun with rays of different lengths, a flower, rainbow or abstract art. Display the artwork or keep for the Review and Reflect lesson.

Station 2 (Linear model)
Provide the children with straws, scissors and a template of a rectangle that measures 2 drinking straws × 1 drinking straw. Ask the children to estimate how many full-length straws it will take to fill the rectangle. Then fill and count. Repeat with half- and quarter-lengths. Can they fill the rectangle with a selection of all three (full-length, half-length and quarter-length) in an interesting pattern? Glue the straws in place. Display the artwork or keep for the Review and Reflect lesson.

Station 3 (Area model)
Provide the children with 2-D shapes: rectangle, circle, square, triangle, other four-sided polygons (which the children do not need to name) for tracing. Using at least one of each whole shape, the children trace, draw and glue the shapes to make a robot. Ask/say:

- Trace, draw and cut each shape in half. Create a robot from these half shapes.
- Trace, draw and cut each shape into quarters. Create a robot from these quarter shapes.

Station 4 (Area model)
Provide the children with geoboards and/or pegboards. Ask them to make 2-D shapes and use different colours to show halves and quarters. Photograph the children's work for display or to use in the Review and Reflect lesson.

Assessment Opportunity

Let's strengthen

When making a robot, some children will benefit from pre-cut shapes (see PCM 1). It may be better to allow some children to work in whatever way consolidates their understanding of whole and half.

Optional consolidation and extension possibilities

Maths Eyes Go on a hunt around the classroom or school environment for whole, half and/or quarter shapes.

Investigation Station Leave examples of paper shapes for the children to further investigate halves and quarters. If available, leave physical examples of squares, rectangles, semi-circles, quarter circles and right-angled triangles for the children to use as fractions from which they create a whole.

Review and Reflect Use the Prompt Questions Poster.

Day 6, Lesson 5

Halving Sets

Focus of learning (with Elements)

- Establishes and identifies half of sets up to at least 20 (U&C)

Learning experiences

- C Game: Huggy
- D Digital activity: Team Trouble
  MAM Routine: Three-Act Task
- C Concrete activity: Whole and Half
  MAM Routine: Build it; Sketch it; Write it
- P Pupil's Book page 22: Halving Sets

Equipment

- Classroom resources such as counters, cubes, bears, branching bonds, number lines, ten frames, cubes, number shapes and rekenreks
- 0–9 spinner

Maths language

- high, low, total

Warm-up

C Game: Huggy

This game can be played outside or in the PE hall. The children run around and, on your command, stop and 'hug' in groups. For example, you call 'Three!' and the children 'hug' in groups of three.

Ask:

- Is every child in the whole class in a group?
- Is every group equal?
- Is there a group which has less/more than three children?

Repeat for other numbers.

Main event

D Digital activity: Team Trouble
MAM Routine: Three-Act Task

Display the Three-Act Task, Team Trouble, to explore a variety of strategies for halving sets.

Act 1: Notice & Wonder

Begin by playing the video, which shows a group of children preparing for a football match. Click to play or ask:

- What do you notice?
- What do you wonder?
- (Reveal the focus question.) How can the teams be split to make it a fair number of players?

The focus here is on the relative size of each team and, from what can be seen, it is an unfair distribution of players between the two teams. Record the children's responses to the 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.

Act 2: Productive Struggle

Look at the image, and using Think-Pair-Share and Write-Hide-Show, click to play or ask:

- Write an estimate for the number of children for each team that is too high on your MWB.
- Write an estimate for the number that is too low.
- Write a reasonable estimate.

If necessary, prompt the children. Click to play or ask:

- Do you have enough information? What else do you need to know?

The children should point out that they do not know the total number of children who will play. There could be more in the dressing rooms, yet to arrive, etc. Click to reveal the second image, which shows 18 children (players) lined up on the pitch. Pause to allow the children to work towards an answer. Click to play or ask:

- What information do you have now?
- To get an answer, what needs to be done?
- What strategies can you use?

Ask the children to choose their preferred way to mathematically model their solution using Build it; Sketch it; Write it.

Act 3: The Big Reveal

The children share and discuss their strategies, models and solutions. If they do not use the key language – *half* and *whole* – model it to them. Say/ask:

- There are 18 children altogether: that is the whole. Half the children are on one team and half are on the other. Half of 18 is 9. That is an equal share.

Click to play or ask:

- What answer did you get?
- How did you get that answer?
- What do you think was the best strategy?

Then click to flip the image and reveal how the players are distributed fairly on each team. Click to play or ask:

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

C Concrete activity: Whole and Half

***MAM* Routine: Build it; Sketch it; Write it**

Ask the children to work in pairs or small groups. Provide the children with counting collection sets and ask them to find half of the set using at least one mathematical model from those below. The pairs/groups can work on different quantities.

Assessment Opportunity

- Build it! Can you use classroom resources to represent the whole set and half the set? Show us.
- Sketch it! Can you represent the whole set and half the set as a sketch? Show us.
- Write it! Can you use words, branching bonds, ten frames, number shapes, the number line or number sentences to represent whole set and half the set? Show us. Use the symbol $\frac{1}{2}$.

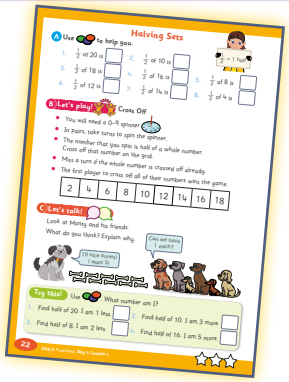
Let's deepen

Some children will be ready to establish and identify half of numbers more than 20.

Let's strengthen

Some children will consolidate their learning by working with numbers in the lower range.

P Pupil's Book page 22: Halving Sets



Optional consolidation and extension possibilities

Games Bank Play 'Spinner Fractions'. Use PCM 13: Spinner Card and the 0–9 spinner.

Estimation Station Using classroom resources, make a variety of sets (in bags or jars) and ask the children to estimate half of each set.

Integration Language: Gaeilge: Imir 'Cén Uimhir atá i gCeist?' Bain usáid as: níos mó, níos lú, leath an uimhir.

Review and Reflect Use the Prompt Questions Poster.

Day 7, Lesson 6

Half Price

Focus of learning (with Elements)

- Establishes and identifies half of sets up to at least 20 (U&C)

Learning experiences

- C Concrete activity: Counting in 1s ***MAM* Routine: Choral Counting**
- D Digital activity: The Pre-loved Toy Shop ***MAM* Routines: Notice & Wonder, with Think-Pair-Share; Reason & Respond**
- D Digital activity: Branching Bond with Coins ***MAM* Routine: Reason & Respond**
- D Toolkit: Ten Frames ***MAM* Routine: Reason & Respond**
- P Pupil's Book page 23: Half Price

Equipment

- Ten frames
- 1c, 2c, 5c and 10c coins
- PCM 8 (per pair)

Maths language

- highest, lowest, price, half price, full price

Warm-up

C Concrete activity: Counting in 1s
***MAM* Routine: Choral Counting**

See it, then say it! Using the 100 square (first 30 squares only) on the inside front cover of their Pupil's Book, ask the children to practise counting forwards in unison in 1s to 30.

Let's deepen

As the children get more confident and competent, challenge them further:

- Ask them to count forwards from various starting points.
- Ask them to count backwards from various starting points.

Let's strengthen

Provide some children with individual counting aids for choral counting.

Main event

Teaching tip

Shopping is a task that children are familiar with from daily life, and it is where fractions and money are interconnected in a very real way. Make time to speak to the children about shopping, half price sales, etc. This lesson uses only the coin denominations the children know from Senior Infants.

D Digital activity: The Pre-loved Toy Shop
***MAM* Routines: Notice & Wonder, with Think-Pair-Share; Reason & Respond**

Display the poster. This toy shop is a pre-loved toy shop. This means that other children have owned and enjoyed these toys but no longer want them. The price for each toy is very low.

Using Think-Pair-Share, ask:

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

Record the children's responses to both questions on the class 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.

Then ask the children to use their MWBs and to give reasons for their responses to the following questions. Click to play or ask:

- What is the full price of the train set?
- What is the full price of the ball?
- What is the full price of the tractor?
- What does the symbol $\frac{1}{2}$ mean?
- Is half price more or less than the full price?
- Two tubs of playdough have a full price of 12 cents. How can we work out what half of 12 cents is?
- What is the price of the train set if it is in the $\frac{1}{2}$ price sale?
- What is the price of the ball if it is in the $\frac{1}{2}$ price sale?
- What is the price of the tractor if it is in the $\frac{1}{2}$ price sale?
- What is the price of the teddy if it is in the $\frac{1}{2}$ price sale?

Many children will inevitably give the correct answer; however, the focus is to have them voice or demonstrate their strategy – how did they work out half price? Use revoicing to deepen the knowledge of strategies. If not suggested by the children, share your strategy through modeling.

Let's strengthen

Provide coins for some children. Some children will need more time to work out half.

D Digital activity: Branching Bond with Coins
***MAM* Routine: Reason & Respond**

Open the resource and select twelve 1c coins to appear on the top circle/plate of the branching bond. Ask:

- How many cents altogether? How do you know?
- What are the two smaller circles/plates in the branching bond to be used for?

Use the 'one in this half, then one in that half' method to halve the amount. As you work, ask:

- Why did I drag one coin onto this circle and then one coin onto that circle? (Point to each of the smaller circles in turn.)

Continue until all twelve coins have been shared between the two circles. Ask:

- How many cents in each half?
- Finish this sentence: I have shown on the IWB that $\frac{1}{2}$ of 12 is ____.

Optional

- What if I use 2c coins? How many coins will make 12c?
- In what part of the branching bond will I put the 2c coins?
- How will I make half and half? ('one in this half, then one in that half' method)
- How much is half of 12c?
- How many is half the coins?

D Toolkit: Ten Frames
***MAM* Routine: Reason & Respond**

Demonstrate how the 'one in this half, then one in that half' method could also be done with a ten frame. Open the Manipulatives e-Toolkit and select the Ten Frames tool. Using 12 counters, distribute the counters using the 'one in the top row, then one in the bottom row' method. Ask:

- Why did I use two ten frames?
- Why did I put one counter in the top row and then one in the bottom row?
- Can you write the number sentence on your MWBs? What is $\frac{1}{2}$ of 12? Use the symbol $\frac{1}{2}$. (Write it on the IWB.)

Give each pair a copy of PCM 8: Branching Bond Template and 1c and 2c coins. The children work through halving the price of more items and recording the number sentences on their MWBs.

Let's strengthen

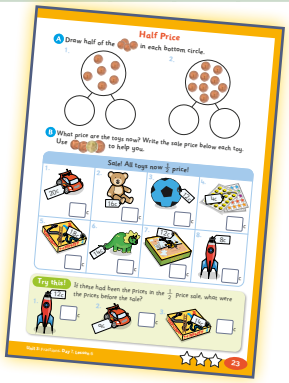
Some children will benefit from advance work with the SET on halves and branching bonds.

Let's deepen

Challenge the children with additional questions, such as: If 4c is $\frac{1}{2}$ price, what is the full price?

Some children will be ready to halve prices above 20c. Challenge them to make price tags for the items which are 'less than $\frac{1}{2}$ price'.

P Pupil's Book page 23: Half Price



Optional consolidation and extension possibilities

Headline Story I had some money. It wasn't enough to buy anything in the Pre-loved Toy Shop at full price. I could buy something at half price in the sale.

Integration Language: Gaeilge: Ag siopadóireacht. English: The language of shopping.

Let's Deepen Use the Unit 3 Let's Deepen PCM.

Review and Reflect Use the Prompt Questions Poster.

Day 8 and 9, Lesson 7

Quarters of Sets

Focus of learning (with Elements)

- Partitions an array of objects or a shape into four equal shares (R)

Learning experiences

- (D) Digital activity: The Cosy Café
  ***MAM* Routines: Notice & Wonder, with Think-Pair-Share; Reason & Respond**
- (C) Concrete activity: Fraction Stations
  ***MAM* Routine: Build it; Sketch it; Write it**
- (P) Pupil's Book pages 24 and 25: Quarters of Sets

Equipment

- Interlocking cubes
- Counters
- Counting collections of 20 items
- PCM 14
- PCM 15
- 0–9 spinner

Maths language

- There is no new maths language in this lesson.

Warm-up

(D) **Digital activity: The Cosy Café *MAM* Routines: Notice & Wonder, with Think-Pair-Share**

Display the poster and, using Think-Pair-Share, click to play or ask:

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

Assessment Opportunity

Record the children's responses to both questions on the class 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) **Digital activity: The Cosy Café**
***MAM* Routine: Reason & Respond**

Display the poster again and click to play or ask:

- How many children can you see?
- How many muffins altogether?
- How many muffins could the children have each?
- Is there an equal share of muffins?
- If two more children join the pair in the café, how many children is that altogether?
- If two more children join, how will they share the muffins?
- If two more children join, will there be an equal share of muffins?
- How did you work out how to share the muffins? (Did anyone work it out a different way?)
- When you share in two, you make halves. When you share in four – what do you call that?
- Can you remember the symbol for a quarter? Write it on your MWB.

You can also ask the following questions:

- What is the symbol for a half? Write it on your MWBs.
- Can you show me on your MWBs how the muffins can be shared equally between two children? Use a branching bond.
- Is there a connection between a half and a quarter?

Let's strengthen

Provide some children with PCM 8: Branching Bond Template and counters for Reason & Respond. Some children may benefit from using four sorting circles and counters, when sharing into quarters.

Some children may benefit from completing the Unit 3 Let's Strengthen PCM before Pupil's Book pages 24–25.

C Concrete activity: Fraction Stations

***MAM* Routine: Build it; Sketch it; Write it**

Station 1

Ask the children to work in pairs or groups. Each pair or group will need a counting collection of 20 items, such as counters or bears. Ask the children to find a quarter of 4, 8, 12, 16 and 20 using at least one mathematical model in each of the three categories below. Provide PCM 14: Fraction Prompt Cards and PCM 15: Bar Model Templates, if needed.

Assessment Opportunity

- Build it! Count your set. Share the set into quarters. Show us.
- Sketch it! Can you represent the whole set and a quarter of the set as a sketch? Show us.
- Write it! Can you use words, branching bonds or number sentences to show a quarter of the set? Show us.

Station 2

Ask the children to work in pairs or groups. Provide the children with PCM 14. The children find the whole amount when given only half or quarter, using at least one mathematical model in each of the three categories below. Provide PCM 15, if needed.

- Build it! Can you use your set of classroom resources to show how you found the whole amount? Show us.
- Sketch it! Can you show this in a sketch? Show us.
- Write it! Can you use words, branching bonds or number sentences to show how you found the whole amount? Show us.

Station 3

Ask the children to work in pairs or groups. Using classroom resources and at least one mathematical model in each of the three categories below, the children show how finding half a set helps in finding a quarter of that set. Ask:

- For what numbers between 4 and 20 will this work?
- For what numbers will it not work?

Provide branching bond and bar model templates (see PCMs 8 and 15), if needed.

- Build it! Can you use your set of classroom resources to show the connection between a half and a quarter? Show us.
- Sketch it! Can you represent this as a sketch? Show us.
- Write it! Can you use words, branching bonds, bar models, rekenreks, cubes, ten frames, or number sentences to show this? Show us.

Conference as the children work so that you can assess their grasp of key language and concepts. Use revoicing to further assess. Are children making the connection between half and quarter?

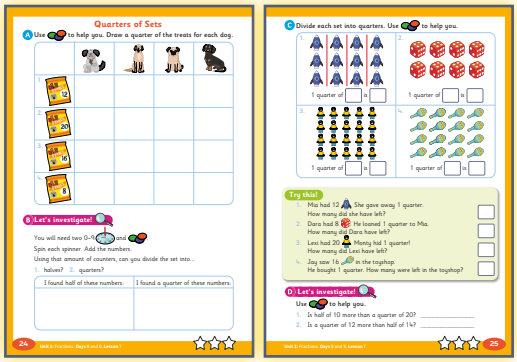
Let's strengthen

Some children may be ready to work with halves of sets only and may continue to work halving and quartering shapes.

Let's deepen

Sort numbers from 1 to 20 into those that can be halved or quartered, and those that cannot. Some children may be ready to halve and quarter quantities above 20.

P Pupil's Book pages 24 and 25: Quarters of Sets



Optional consolidation and extension possibilities

Tea Party Table Set up a tea party table using four dolls, plastic figures, puppets or teddies. Leave 'muffin collections' to be shared in quantities from 4 to 20. The 'muffins' can be paper cut-outs. The children can make their own collections to share.

Concept Map Ask the children to make a concept map showing the relationship between halves and quarters.

Review and Reflect Use the Prompt Questions Poster.

Home/School Links Book Page 11 can be completed at any stage after this lesson.

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!
Classroom poster: Review and Reflect. Use Think-Pair-Share alongside the prompt questions to review the unit.	Play any of the games from the Games Bank. D **Fractions Bingo:** Play the interactive bingo game.
Maths language	**Maths strategies and models**
Ask the children to explain the following terms (perhaps using examples or drawings on their MWBs): whole, part, equal, unequal, fair, unfair, half, quarter, more than half, less than quarter, full length, half length, quarter length, total, set. 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? Complete the My Maths Fact File on Page 122 of the Pupil's Book.	Ask the children to give and/or draw examples of the models they used in this unit. For the various tasks, how did they record their findings? What did they build, sketch or write? Did they use concrete materials, shapes, number lines or bar models?
Progress Assessment Booklet	**Maths eyes**
Complete Questions 10–13 on pages 10–11. Alternatively, these can be left to do as part of a bigger review during the next review week.	Model the activity. In time, some children might like to lead it or to play it in groups. The children write or draw their answers on the MWBs. I Spy ... A shape I can halve A shape I can quarter A shape which is also half of a whole shape A shape which is also quarter of a whole shape A number that I can halve A number that I can quarter A number that is half of a bigger number I know A number that is a quarter of a bigger number I know.
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 3 Let's Strengthen PCM. Consult the Unit 3 Let's Strengthen Suggestions for teachers.	Use the Unit 3 Let's Deepen PCM.

Notes