Maths and Me: 2nd Class – Short-Term Plan, Unit 18: Number Sentences (June: Week 1)

Strand(s) > Strand Unit(s)	Algebra > Expressions and Equations. Number > Sets and Operations..
Learning Outcome(s)	Through appropriately playful and engaging learning experiences children should be able to interpret the meaning of symbols or pictures in number sentences; select, make use of and represent a range of addition and subtraction strategies.

Lesson	Focus of Learning (with Elements)	CM	Learning Experiences	Assessment
1	**Equal or Not Equal:** Investigates and tests the equality or 'trueness' of number sentences (U&C); Explores alternative ways of expressing number sentences (e.g. c = a + b / a + b = c) (U&C)		D Notice & Wonder L1, 3 D Think-Pair-Share L1, 3–4 D Reason & Respond L1–4 D Write-Hide-Show L1–3 C P Let's investigate: Will it Balance? L1 C Matching Answers L2 C Let's investigate: Not Balanced L2 D Concept Cartoon L4 **Print resources** Pupil's Book pages 107–110 Home/School Links Book page 38 PCMs 51–53	**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 page 29
2	**Comparing Amounts:** Records equivalent and non-equivalent sets up to 99, using <, > and = (C)			
3	**Picture Puzzle Number Sentences:** Uses a symbol or picture to represent an unknown value in a number sentence (C); Recognises that symbols can also be used to stand for or represent a variable which can be known or unknown, and which changes depending on the context in which it is used (R)			
4	**Numberless Stories:** Translates verbal and/or word problems involving addition and subtraction of increasing complexity into written number sentences or expressions (and vice versa) (C); Constructs number sentences and number stories to solve problems involving addition and subtraction within 199 (A&PS)			
5	**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 '2nd Class *Maths and Me* Progression Continua Overview' for a detailed breakdown of how all progression continua are covered.
Maths Language	See '2nd Class *Maths and Me* Maths Language Overview', individual lesson plans and Unit 18 Maths Language Cards.
Equipment	See '2nd 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 18 Let's Strengthen Suggestions for Teachers. (These address the Common Misconceptions and Difficulties listed below.) • See Unit 18 Let's Strengthen PCM. • See Unit 18 Let's Deepen PCM.
Integration	See individual lesson plans.

Background and rationale

- This unit continues with the overarching theme of The Playground from Unit 17: Measuring 3, since the see-saw (as a balance) can be a useful visual to explain number sentences.
- This unit is deliberately placed towards the end of 2nd Class; by now the children are already quite familiar with number sentences and number stories/word problems from many of the other units. The activities in this unit allow the children to focus specifically on the mathematical symbols used in number sentences, and their meanings and purposes, as well as to explore numberless word problems.
- *Maths and Me* for 2nd Class does not use the terminology of 'equations' or 'inequalities', but refers instead to all of these mathematical statements as number sentences.
- Equals: Many children incorrectly translate the equals symbol (=) as meaning 'and the answer is ...'. This incorrectly reinforces that both its purpose and position is to precede the answer in any calculation. Such misunderstanding is evident in responses such as these examples:
  - 5 + $\boxed{16}$ = 11 (i.e. 5 + 11 is 16) – assumes that the missing value is the total of the given numbers.
  - $\boxed{1}$ = 5 + 6 (i.e. 1 + 5 is 6) – assumes that the last number is the total and the first two are addends
  - 5 + 6 = $\boxed{11}$ + 3 (i.e. 5 + 6 is 11)
  - 5 + 6 = 3 + $\boxed{14}$ (i.e. 5 + 6 + 3 is 14)
- Estimation and relational thinking: When children are comparing both sides of a number sentence, encourage them to closely examine the numbers involved, and to use estimation, number sense and relational thinking instead of actually carrying out the calculations. To develop and encourage relational thinking and efficiency, provide examples that discourage calculations (e.g. large numbers, quantities that clearly differ by a large amount, true-or-false activities).

Glossary

Number sentence: a mathematical statement, written using numerals and mathematical symbols (+, –, =, ≠, < and/or >). Number sentences include both equations and inequalities, can be complete or may contain boxes or shapes to indicate an unknown value, symbol and/or a variable

Equation: a type of number sentence or mathematical statement containing an equals symbol (=)

Inequality: a type of number sentence or mathematical statement containing a greater than (>) or less than (<) symbol

Variable: a value that changes

Numberless word problem: a word problem in which all of the numbers have been removed

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

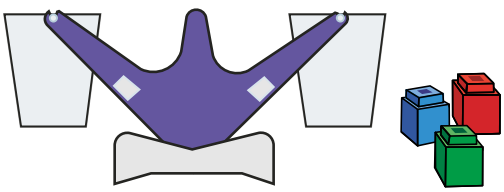
Common misconceptions and difficulties

- The children may incorrectly interpret the equals symbol (=) as 'gives an answer of' or 'makes'. They might see it as something you do, rather than understanding that it shows that the value(s) that comes before the symbol is the same as the value(s) coming after it.
- They may struggle to read and/or confuse the inequalities symbols (< and >).
- They may not appreciate that it is not always necessary to calculate expressions on both sides of the number sentence: sometimes estimation skills are sufficient to work out the required response.
- They may incorrectly translate verbal and/or word problems into written number sentences or expressions (and vice versa).
- They may not consider the mathematical situations being presented in word problems, and instead react by plucking out the numbers and using them to perform any operation. (Numberless word problems and the 'three reads' approach are both useful strategies to counter this compulsion to calculate.)

The Unit 18 Let's Strengthen Suggestions for Teachers address the common misconceptions and difficulties listed above.

Mathematical models and representations

- Balance and interlocking cubes
- Representations of classroom-based resources that could be used to model number sentences and number stories
- Images and icons to represent values
- The children's own choices, which may include number lines, bar models and branching bonds.



Bucket balance and interlocking cubes

Images and icons to represent values

Teaching tip

Number Line, Bar Model and Branching Bonds 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

Equal or Not Equal

Focus of learning (with Elements)

- Investigates and tests the equality or 'trueness' of number sentences (U&C)
- Explores alternative ways of expressing number sentences (e.g. c = a + b / a + b = c) (U&C)

Learning experiences

- (D) Digital activity: The Playground ***MAM* Routines: Notice & Wonder, with Think-Pair-Share; Reason & Respond**
- (D) Video: Relational Symbols (= and ≠) ***MAM* Routines: Reason & Respond, with Write-Hide-Show**
- (C) (P) Let's investigate: Will it Balance?
- (P) Pupil's Book page 107: Equal or Not Equal

Equipment

- Commercial balance scales*
- Interlocking cubes or any other available classroom resources of which there are multiples of the same object (same shape and mass, but different colours) that could be used on the balance (e.g. spools, marbles, etc.)
- PCM 51

** A pan or bucket balance is ideal for this. While a number balance can also be quite useful for addition, it is not as useful to demonstrate subtraction. The number balance is also more abstract and less visual than cubes on a pan/bucket balance.*

Maths language

- number sentence, equals (=), not equal (≠), true, balance, same, match

Teaching tip

It is vital to success with number sentences and future algebra experiences that the children recognise that the equals symbol indicates that both sides of the number sentence (which, in more senior classes, will more accurately be called 'an equation') are equal to one another/the same value/balanced. In this way, a balance (pan or bucket) and cubes are extremely valuable for modeling (and solving) number sentences with the equals symbol. Ensure that you reinforce the correct meaning of the equals symbol by translating it only as 'equals', 'is equal to' and/or 'is the same as' (and not reading it as 'makes' or 'gives').

Warm-up

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

Display the first slide, which shows Jay and Mia playing with a see-saw. Using Think-Pair-Share, ask:

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

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

Main event

(D) **Digital activity: The Playground *MAM* Routine: Reason & Respond**

Display the slideshow. Ask the children to answer the following questions and to give reasons for their responses, where appropriate (some of these may already have been answered in the warm-up):

Assessment Opportunity

Slide 1

- What do you think the children are doing? (playing with the see-saw, placing an identical cardboard box on each side; the boxes appear to have large wooden skittles inside, same shape and size)
- What are in the boxes? (wooden skittles)
- What can we say about the see-saw and the boxes? (The see-saw is balanced, level, etc. The boxes are the same weight.)
- What does that tell us about the number of skittles in each box? (same number/amount)
- On your MWB, write a maths symbol we could use to show this. How do we read that symbol? (=, is equal to)

Slide 2

- What can we say about the see-saw and boxes now? (The see-saw is not balanced, level, etc. The boxes are not the same/equal weight.)
- How might this have happened? (Perhaps items were added or subtracted from one of the sides.)
- What does that tell us about the number of skittles in each box? Explain why. (They are not equal.)
- On your MWB, can you show me a maths symbol we could use to show this? How do we read that symbol? (≠, not equal – demonstrate if necessary)
- What could be done to the boxes to balance the see-saw again?

Let's strengthen

While the children were first introduced to the not-equal symbol (≠) in *Maths and Me* for 1st Class, the children may still require extra verbal reinforcement until they are more secure in interpreting it.

D **Video: Relational Symbols (= and ≠)**
***MAM* Routines: Reason & Respond, with Write-Hide-Show**

Play the video. Allow the children time to respond to the questions and to give reasons for their answers.

Teaching tip

Regarding the not-equal symbol (≠), prompt the children to suggest other places where they have seen a diagonal line through a symbol to mean 'no' or 'not' (e.g. on road signs, no right/left turn, no parking, no entry, no smoking, no dogs allowed).

C P **Let's investigate: Will It Balance?**

Distribute a balance scale, interlocking cubes or other resources to use on the balance, and a copy of PCM 51: Number Sentences to each group. Alternatively, display the PCM to the whole class on the IWB. From the PCM, choose a number sentence to investigate. (The number sentences could also be cut out and turned face down on the table, so that one is chosen at random.) The following is the suggested procedure, using 15 = 7 + 8 as an example. Say/ask:

- Read this number sentence aloud for me. ('Fifteen equals seven plus eight.')
- Do you think this number sentence is true? Explain why.
- How might we use our balance and materials to represent this number sentence?
- Will it be balanced or not? Record your prediction. (For example, on their MWBs, they write a tick mark or an ✘ to indicate whether or not the number sentence will balance.)
- What is the value on the left-hand side of the equals symbol? Place that number of cubes on the left-hand side of the balance. (Use the same colour, if possible.)
- What are the values on the right-hand side of the equals symbol? Place that number of cubes on the right-hand side of the balance. (Use seven of one colour and eight of another colour, if possible.)
- What do you notice? Was your prediction correct?
- Is this number sentence true? Is it okay to use the equals symbol?
- (In the case of a number sentence that is not true:) If this number sentence is not equal, what can we do to the equals symbol to change it to show 'not equal'? (Draw a line through it.)

For any of the untrue statements, ask the children to change the equals symbol to 'not equal'. The children may also suggest greater than (>) or less than (<). Acknowledge that this is correct, but emphasise that today the focus is on 'equal' or 'not equal' only.

For subtraction expressions, if necessary, demonstrate how the starting value (minuend) should be first placed in the appropriate side of the balance before removing the amount to be subtracted (subtrahend) from this. Pictorially, the minuend can be drawn first, and then the number of the subtrahend crossed out to clearly leave the difference/remainder.

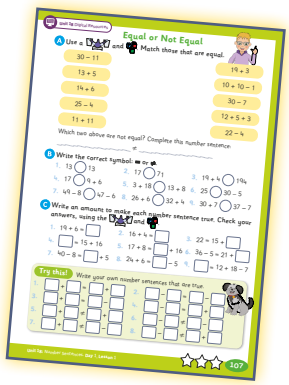
Let's deepen

Using cubes of two different colours on either side of the balance, challenge the children to create combinations that are equal and not equal (e.g. 9 + 3 = 6 + 6; 5 + 3 ≠ 4 + 3). The children record what they did, using drawings, number sentences that include the symbols for equals (=) and not equal (≠), and/or words.

Teaching tip

The numbers given on PCM 51 are deliberately chosen to be small, in case there are not sufficient resources to represent larger numbers. That said, if there are sufficient resources, you could increase the numbers to make the task more challenging.

Pupil's Book page 107: Equal or Not Equal



Teaching tip

While the children may feel that they do not require the balance to complete this page, encourage them to use it to internalise the concept. This better prepares them for the concept of balancing equations in the senior classes.

Let's strengthen

- The children might benefit from using the balance to 'check' their answers.
- Rather than completing B and C on Pupil's Book page 107, the children could complete the parallel tasks A and B on the Unit 18 Let's Strengthen PCM.

Let's deepen

Challenge the children to suggest how they might identify the correct answer, without actually calculating both sides of the number sentence (i.e. to use their estimation and number sense skills to quickly notice when a number sentence is obviously false/unbalanced). See also the Unit 18 Let's Deepen PCM.

Optional consolidation and extension possibilities

Story Read *Equal, Shmequal* by Virginia Kroll, or listen to a reading at: edco.ie/p5qk

STEM Project This unit could be a springboard to a bigger STEM project, based around the topic of the playground (e.g. exploring the effect of friction on a slide, movement on a swing, designing and making a playground for a small doll or figure).

Integration Oral language development around the theme of the playground. Gaeilge: Caitheamh aimsire, An Aimsir – An Samhradh. Geography: Human environments (The Playground); Map skills. Visual Arts: Making, looking and responding to prints and discussing the area of various prints; Making, looking at and responding to mosaics and discussing their area.

Games Bank Play the 'True or False' games or 'Equals, Please!'

Maths Journal The children use images, number sentences and/or words to record how they conducted the investigation in the main part of this lesson.

PCM 52 Tell the children to add drawings to make the scales true, and then write the matching number sentence below each, using equals or not equal.

Number of the Day Each morning, write a number on the board/flip chart. To this, the children add their own number sentences that equal the target number. Encourage them to write a number sentence that is different from those already there, and to become more and more creative (e.g. using more numbers, more operation symbols).

Review and Reflect Use the Prompt Questions Poster.

Day 2, Lesson 2

Comparing Amounts

Focus of learning (with Elements)

- Records equivalent and non-equivalent sets up to 99, using <, > and = (C)

Learning experiences

- C Concrete activity: Matching Answers
- D Video: Relational Symbols (< and >)
  MAM Routines: Reason & Respond, with Write-Hide-Show
- C Let's investigate: Not Balanced
- P Pupil's Book page 108: Comparing Amounts

Equipment

- Cloakroom tickets or numbers written on pieces of paper (duplicated at least twice)
- Small sticky notes
- Commercial balance scales
- Interlocking cubes or any other available classroom resources of which there are multiples of the same object (same shape and mass, but different colours) that could be used on the balance (e.g. spools, marbles, etc..)
- PCM 50

Maths language

- more than, greater than (>), less than (<)

Teaching tip

While the children have been using the greater than (>) and less than (<) symbols since 1st Class, many may still have difficulties reading them and interpreting their meaning. Using a balance and concrete materials (in a similar way to when teaching the equals symbol) can greatly help children to gain deeper understanding of the symbols and their meanings.

Warm-up

C Concrete activity: Matching Answers

You will need cloakroom tickets or numbers written on pieces of paper (of a number range appropriate to the abilities of the class), duplicated at least twice. Distribute a sticky note and a number to each child, for which they make a true number sentence. The children do not show their answers to each other, and there must be at least two children with the same answer each time. Each child writes their number sentence (without the accompanying answer) on their sticky note, and sticks this to their forehead. The children then move about the classroom until they locate the bearer of a number sentence whose answer matches their own. The sticky notes are then displayed with an equals sign between related pairs.

- How complex are the number sentences created?

Main event

D Video: Relational Symbols (< and >)
MAM Routines: Reason & Respond, with Write-Hide-Show

Reflecting on the previous lesson, ask:

- Can you remember a number sentence that was not balanced yesterday?

- (If the children have used the not-equal symbol, ≠:) What other symbol could be used instead of the not-equal symbol? (< or >)
- How could we describe the relationship between the two amounts?
- These symbols can sometimes cause confusion; why do you think that is?

- How do you ensure that you are using the correct symbol?

Play the video. Allow the children time to answer the questions and give reasons for their responses.

C Let's investigate: Not Balanced

Distribute a balance scale and interlocking cubes or other resources to each group. Draw '8 > __' on the board, and say/ask:

- Place eight cubes on the left-hand side of your balance. What different amounts could be placed on the right-hand side so that this number sentence is true? (1, 2 ... 7)

Draw '4 < __' on the board, and say/ask:

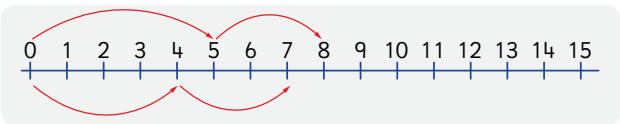
- Place four cubes on the left-hand side of your balance. What different amounts could be placed on the right-hand side so that this number sentence is true? (5, 6, 7 ...)

Using PCM 50: Number Sentences from the previous lesson and their balance, ask the children to:

- Identify number sentences that are not equal
- Identify which inequalities symbols to use to make the number sentences true.

Using cubes of two different colours on either side of the balance, challenge the children to create combinations that are not equal (e.g. 5 + 3 > 4 + 3). The children record what they did, using drawings, number sentences that include the symbols for greater than (>) and less than (<), and/or words.

Let's strengthen

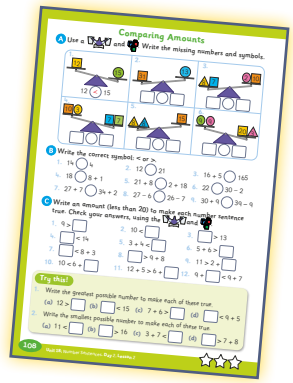


The children could also use the open number line on the reverse of their MWBs, as a double number line (see image) on which to model the relationships and compare the values.

Let's deepen

In the case of number sentences such as '7 > __', challenge the children to predict the maximum number that could be used. In the case of number sentences such as '7 < __', challenge the children to predict the minimum number that could be used. The children can then use the balance to test their predictions. Prompt the children to recognise the maximum number on the less than side, or the minimum number on the greater than side as being just one above/below the amount required to balance the number sentence.

P Pupil's Book page 108: Comparing Amounts



Let's strengthen

Rather than completing B on Pupil's Book page 108, the children could complete the parallel task C on the Unit 18 Let's Strengthen PCM.

Optional consolidation and extension possibilities

My Maths Fact File The section on Symbols on the top of page 122 can be completed at any stage after this lesson.

Games Bank Play 'Domino Draw Number Sentences'.

Story Read *Balancing Bears: Comparing Numbers* by Megan Atwood, or listen to a reading at: edco.ie/uvk3

PCM 52 Tell the children to add drawings to make the scales true, and then write the matching number sentence below each, using greater than or less than symbols.

Maths Journal The children use images, number sentences and/or words to record how they conducted the investigation in the main part of this lesson.

Review and Reflect Use the Prompt Questions Poster.

Day 3, Lesson 3

Picture Puzzle Number Sentences

Focus of learning (with Elements)

- Uses a symbol or picture to represent an unknown value in a number sentence (C)
- Recognises that symbols can also be used to stand for or represent a variable which can be known or unknown, and which changes depending on the context in which it is used (R)

Learning experiences

- (D) Digital activity: Slow-Reveal Playground Picture Puzzle *MAM* Routines: Notice & Wonder, with Think-Pair-Share; Reason & Respond, with Write-Hide-Show
- (P) Pupil's Book page 109: Picture Puzzle Number Sentences

Equipment

- There is no equipment needed for this lesson.

Maths language

- picture puzzles

Warm-up

(D) Digital activity: Slow-Reveal Playground Picture Puzzle *MAM* Routines: Notice & Wonder, with Think-Pair-Share

Display the PowerPoint presentation and go to Slide 3, which shows incomplete number sentences with playground images. Using Think-Pair-Share, ask:

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

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

Main event

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

Open the PowerPoint and display Slide 3 again. Ask the children to answer the following questions and to give reasons for their responses (some of these questions may have already been answered in the warm-up):

Assessment Opportunity

- What might you call these?
- These are number sentences; how do you know?
- How are these number sentences the same as other number sentences that you have seen? How are they different?
- Why do you think pictures are used?

Display Slide 4, and say/ask:

- These pictures represent numbers. Working with a partner, use your MWB to show what numbers they might represent.
- Do you think the numbers represented by the pictures are different or the same? Explain why.
- These are often called maths picture puzzles. In this type of puzzle, wherever we see the same pictures, we can assume that they represent the same number.

Display Slide 5 and say/ask:

- What new information do you have?
- Working with a partner, use your MWB to show what you now think. Explain why.

Display Slide 6. Ask/say:

- What new information do you have?
- Working with a partner, use your MWB to show the possible numbers that the swing and monkey bars might represent. Explain why.

Once the children realise that the two possible numbers are bonds of 10, ask:

- What bonds of 10 are the pictures not representing? (5 + 5 and 0 + 10) Explain why.

Display Slide 7. Ask:

- What new information do you have?
- What is the biggest and smallest possible number that could go in the box? Explain why.

Display Slide 8. Ask:

- What new information do you have?
- Does this help? How?

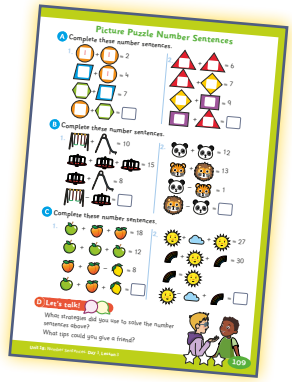
Display Slide 9. Say:

- Working with a partner, solve this last sentence.

Let's deepen

Return to Slide 3 and challenge the children to suggest other values for the pictures that could work to create a new puzzle (e.g. the values of the pictures could be doubled/halved). In this way, the children may begin to develop an understanding of the pictures as variables (i.e. symbols that represent different values in various situations).

Pupil's Book page 109: Picture Puzzle Number Sentences



Allow the children to work together to solve the picture puzzles. Stop them at intervals, and ask them to share their tips and strategies with the class.

Optional consolidation and extension possibilities

Online Picture Puzzles Lots of picture puzzles, similar to those used in this lesson, are available online. Search for 'maths picture puzzles', and select those that suit the abilities of the class (e.g. those that only use addition and subtraction symbols). See also the Unit 18 Let's Deepen PCM.

Picture Puzzle Number Sentences Working individually or in groups, ask the children to create their own picture puzzle number sentences, which they then swap with others and solve. Suggest that they first write some complete, simple number sentences, using the same three or four values, and then replace those values with different colours, shapes, simple images, etc.

SolveMe Mobiles For interactive puzzles, using virtual mobiles and balanced structures with hidden values for the weights, go to: edco.ie/dd27

The puzzles start off simple and then become more complex, and will help to develop algebraic and problem-solving skills. Users can access the puzzles as guests or log in for free, allowing them to save their progress from one session to the next.

Review and Reflect Use the Prompt Questions Poster.

Day 4, Lesson 4

Numberless Stories

Focus of learning (with Elements)

- Translates verbal and/or word problems involving addition and subtraction of increasing complexity into written number sentences or expressions (and vice versa) (C)
- Constructs number sentences and number stories to solve problems involving addition and subtraction within 199 (A&PS)

Learning experiences	Equipment
D Digital activity: Number Stories ***MAM* Routines: Concept Cartoon, with Think-Pair-Share** D Digital activity: Slow-Reveal Numberless Word Problems ***MAM* Routines: Reason & Respond, with Think-Pair-Share** P Pupil's Book page 110: Numberless Stories	• Classroom materials for modeling word problems • Open number lines

Maths language

- number stories, numberless word problems

Teacher note: In *Maths and Me* for Second Class, the children have already had many opportunities to achieve these focuses of learning, especially in the Addition and Subtraction units (e.g. Try This!, Build it; Sketch it; Write it!, and Three-Act Task). This lesson allows the teacher to review these skills and explore the concept of numberless word problems.

- In numberless word problems, the absence of numbers means that the children cannot jump to the calculation stage of the problem-solving process, where often they just focus on the numbers and perform what they think is the expected calculation (e.g. the operation that they are currently studying). With numberless word problems, they must first engage in a sense-making process and consider:
  - What does it tell you? What is going on in the problem? Can you visualise it (picture it in your head)?
  - What could be assumed about the amounts in the problem, and the relationship between them, even though there are no numbers?
  - What is, or might be, the question? What is it asking us to do?
  - Numberless word problems are best presented as slow-reveal activities in order to control the information provided (see Digital activities for Lesson 4). This gives the children time and space to reason out quantities and relationships in the problem, make considered estimates and justify the reasonableness of their estimates.
    See: edco.ie/vjnr
  - The 'three-reads approach' for word problems echoes the approach to numberless word problems and can be used with any word problem. See the Unit 18 Let's Strengthen Suggestions for Teachers.

Warm-up

D **Digital activity: Number Stories *MAM* Routines: Concept Cartoon, with Think-Pair-Share**

Display the Concept Cartoon, in which the characters propose number sentences to match the number story. Using Think-Pair-Share, ask:

- What do you think?
- (Point to a specific character.) Do you agree with their idea? Explain why.
- Do you think something different? Why do you think this?

If appropriate, 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. Ask:

- In what way are the suggested number sentences similar?
- In what way are they different?
- How could we find out who is correct?
- Could we use concrete or pictorial models? How?
- Can you suggest a number story that would match each of the other three number sentences?

Ask the children to present their suggested approaches and/or solutions.

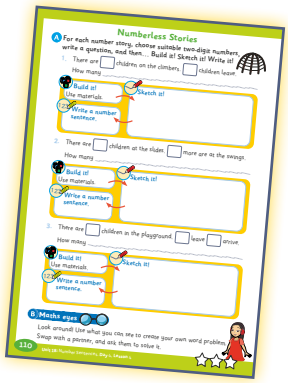
Main event

D **Digital activity: Slow-Reveal Numberless Word Problems** ***MAM*** **Routines: Reason & Respond, with Think-Pair-Share**

Display the PowerPoint presentation and work through the slides, one by one. Using Think-Pair-Share, allow the children time to answer the questions and to give reasons for their responses, before moving to the next slide. Allow the children ample time to model the problem, using materials, sketches (e.g. using the open number line(s) on the reverse of their MWBs) and/or number sentences, and to report back on their chosen methods. As new information is revealed, encourage the children to explain this new information and how it changes their understanding of the situation.

Assessment Opportunity

P **Pupil's Book page 110: Numberless Stories**



Teacher Note: Slow-reveal digital activities are the best type of activities for exploring numberless word problems. Thus, in the print activities, it is necessary to leave a space for a number to be entered, where 'some' would have been used in the digital equivalent.

Let's strengthen

The children may benefit from choosing only numbers up to 10 or 20.

Let's deepen

Challenge the children to use much bigger numbers in their problems, including numbers above 100, if appropriate. Challenge them also to include wider contexts, such as ones that include measures.

Optional consolidation and extension possibilities

Numberless Word Problems For further information and many more examples of suitable problems, go to: edco.ie/vjnr

Numberless Word Problems Use familiar word problems to create numberless word problems. Using digital tools or concrete materials, hide (cover) the numbers in the problem and the question being asked. Reveal each number in turn, before revealing the question. See also the Unit 18 Let's Strengthen Suggestions for Teachers.

Home/School Links Book Page 38 can be done at any stage after this lesson.

Headline Stories Display various Headline Stories to the class and use these to inspire the children to create word problems to share with others. Find suitable Headline Stories here: edco.ie/emxr

Alternatively, you could search online for 'maths headline stories'.

Maths Journal The children create their own numberless word problems, without or with the help of PCM 53: Number Stories Graphic Organiser.

And the answer is ... Choose a number. Tell the children to create a word problem and/or number sentence that would arrive at the chosen number as the answer. You could incorporate this activity into Number of the Day (see Lesson 1).

Review and Reflect Use the Prompt Questions Poster.

Day 5, Lesson 5

Review and Reflect

Focus of learning (with Elements)
• Reviews and reflects on learning (U&C)

Warm-up

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

Main event

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

Let's talk!	Let's create!
Review and Reflect Poster: Use Think-Pair-Share alongside the prompt questions to review the unit. The children record what they know in their maths journals (e.g. using a concept map). Individual children could present examples of their own picture puzzles and/or word problems to the class, and talk about what they have learned.	Ask the children to create their own puzzles and problems to pose to others in the class, using some of the activities within this unit as inspiration. They could also look up these and other types of mathematical puzzles online to share with the class.
Maths language	**Maths strategies and models**
Ask the children to explain the following terms (perhaps using examples or drawings on their MWBs): number sentence, equals (=), not equal (≠), true, balance, same, match, more than, greater than (>), less than (<), picture puzzles, number stories, numberless word problems. Use the Unit 18 Maths Language Cards for this unit. For example: if the image and text are cut apart, can the children match them? If not completed already, complete the top part of the My Maths Fact File on page 122 of the Pupil's Book.	Ask the children to give examples of the strategies (e.g. using a pan/bucket balance, estimating the value of each side of a number sentence rather than calculating it) and models (concrete materials, sketches, number lines, bar models, number sentences) used in this unit. Were there any strategies or models that they preferred, and why?
Progress Assessment Booklet	**Maths eyes**
Complete Questions 66–68 on page 29. Alternatively, these can be left to do as part of a bigger review during the next review week.	Using images cut from a variety of print media (e.g. catalogues, magazines, flyers from shops), ask the children to make up matching word problems and number sentences (e.g. 'If there are six bottles of water in a pack, how many bottles would there be in two packs?'). The number stories can be added to the class display.
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 18 Let's Strengthen Suggestions for Teachers and/or use the Unit 18 Let's Strengthen PCM.	Use the Unit 18 Let's Deepen PCM.