# *Maths and Me*: 2nd Class – Short-Term Plan, Unit 12: Addition and Subtraction 3 (March: Weeks 1&2)

Number > Sets and Operations; Numeration and Counting. Algebra > Expressions and Equations; Patterns, Rules and Relationships.

Strand(s) > Strand Unit(s)

s; demonstrate erns, including	Assessment	Intuitive Assessment: responding to emerging misconceptions		Planned Interactions: responding to insights gleaned from children's responses	to learning experiences	Assessment Events: information gathered	the unit assessment in the Progress Assessment Booklet	page 22
rt a range of addition and subtraction strategie inces; identify and express relationships in patt	Learning Experiences	<ul> <li>Ping-pong Number Bonds of 10 L1</li> <li>O O Notice &amp; Wonder L1, 6</li> <li>Think-Pair-Share L1</li> </ul>	O       O       Reason & Respond L1, 5–6         O       Would This Work? L1–5         O       O       Build it; Sketch it; Write it L1–6	Number Strings L1–2 Write-Hide-Show L1, 2, 5 Three-Act Task L2 I Do, We Do, You Do L2	<ul> <li>Ping-pong Number Bonds of 100 L3</li> <li>Choral Counting L4–6</li> </ul>	<b>Print resources</b> Pupil's Book pages 76–81 Home/School Links Book pages 28–29		
d represen iber sente	CM							
Through appropriately playful and engaging learning experiences children should be able to select, make use of an proficiency in using and applying different counting strategies; interpret the meaning of symbols or pictures in nur growing or shrinking shape patterns and number sequences.	Focus of Learning (with Elements)	<b>igh Tens (within 100):</b> Explores subtraction through 10, within 100 (U&C); Describes mental I to compute (C)	<b>Renaming:</b> Subtracts numbers with renaming (U&C); Develops strategies for efficient f subtraction (R)	iently recalls bonds of 100 (multiples of 10) (C); Uses knowledge of simple fact groups (bonds op further calculation strategies (bonds of 100) (R)	acting Ones (100 to 200): Uses number lines and benchmark numbers to count forwards and &PS); Establishes the relationship between numbers and their position in a hundred square (R); ns using known number facts and knowledge of mental strategies (A&PS)	<b>acting Tens (within 200):</b> Explores addition and subtraction of tens, within 200 (U&C); Draws from roperties to derive unknown number facts from core facts (A&PS)	<b>e (within 200):</b> Explores subtraction as comparison/difference (U&C)	<b>ct:</b> Reviews and reflects on learning (U&C)
utcome(s)		Subtracting Thr strategies us	Subtracting wit computation	<b>Bonds of 100:</b> F of 10) to dev	<b>Adding and Sub</b> backwards (A Solves proble	Adding and Sub patterns and	Finding Differe	Review and Ref
Learning O	Lesson		5	œ	4	2	9	7

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: G concrete activity; D digital activity; P activity based on printed materials, followed by lesson numbers.

## **Additional information for planning**

Progression Continua	See '2nd Class <i>Maths and Me</i> Progression Continua Overview' for a detailed breakdown of how all progression continua are covered.			
Maths Language	See '2nd Class Maths and Me Language Overview', individual lesson plans and Unit 12 Maths Language Cards.			
Equipment	e '2nd Class Maths and Me Equipment Overview' and individual lesson plans.			
Inclusive Practices	<ul> <li>See Let's Strengthen and Let's Deepen suggestions throughout lesson plans.</li> <li>See Unit 12 Let's Strengthen Suggestions for Teachers. (These address the Common Misconceptions and Difficulties listed below.)</li> <li>See Unit 12 Let's Strengthen PCM.</li> <li>See Unit 12 Let's Deepen PCM.</li> </ul>			
Integration	See individual lesson plans.			

## **Background and rationale**

- This unit builds on the concepts explored in Units 2 and 8 Addition and Subtraction 1 and 2, and Unit 7 Numbers to 200, and extends this understanding to addition and subtraction of amounts up to 200. This understanding will be further developed in Unit 19 – Addition and Subtraction 4.
- As in Unit 2, while this unit is concerned largely with the strand unit of Sets and Operations, it also includes learning experiences from Patterns, Rules and Relationships, Numeration and Counting, Expressions and Equations, and, to a lesser extent, Place Value and Base Ten.
- Mathematical modeling is again very much the focus of this unit. Featuring strongly in almost every lesson are the *MAM* Routines of Build it; Sketch it; Write it, and Would This Work? While it is important that the children develop procedural fluency with such standard algorithms as the column method, it is essential that this is balanced to include other computation methods and models especially since many of these support the development of mental calculation skills. Ultimately, the aims are to: enable the children to choose their preferred models and approaches; prompt them to consider the efficiency of their strategies; and support them to become less reliant on inefficient strategies (e.g. counting in ones for adding/ subtracting numbers more than 10).
- As mentioned in previous Number units, consider incorporating a quick 1–2-minute counting practice (forwards, backwards, various starting points and/or intervals), focused on a range appropriate to the needs of your class, as part of your daily classroom routine, both within and outside of maths lessons (e.g. brief counting sessions could be included as part of morning welcome, transitions between lessons, en route to the hall or yard, and while children are tidying up after breaks and/or to go home).
- While no specific lessons in this unit are dedicated to estimating numbers and checking calculations, find every available opportunity throughout this and all units to embed these strategies by regularly asking the children to estimate a reasonable answer (e.g. *Is it forty-something, fifty-something or sixty-something?*) and prompting them to check their answers (e.g. by solving the same calculation a different way, using the inverse operation).

The theme of this unit is The Birthday Party.

## **Common misconceptions and difficulties**

See also the Common Misconceptions and Difficulties sections in Units 2 and 8 – Addition and Subtraction 1 and 2. Additionally:

- The children may lack confident knowledge of the number bonds of 10, of 20 and within 20, and/ or the make-ten strategy (These are vital prerequisite knowledge for performing operations with numbers above 20 and for using the column method correctly.)
- The children may use an incorrect procedure when using the column method for addition and subtraction. They may, for example:
  - Consider each digit as a separate number rather than as a representation of the number of tens
    or ones
  - Mistranslate a calculation from horizontal to vertical format and vice versa
  - In addition, forget to rename; reverse the digits when they rename (i.e. carry over the ones value, not the tens); rename correctly, but forget to add new ten(s); rename when not required
  - In subtraction, fail to rename at all; subtract the smaller digit (on top) from the larger digit (on the bottom); rename incorrectly, rename when not required.
- When creating number bonds of 100 that end in five, the children may suggest pairs that add to 110 rather than 100 (e.g. 75 + 35; 55 + 55), because they are making 10 with both digits (i.e. 10 ones and 10 tens, rather than 9 tens and 10 ones).
- They may became over-reliant on the column method and use it even when it might not be the most efficient approach (e.g. subtracting from 100 to identify number bonds of 100).
- They may incorrectly verbalise numbers above 100 (e.g. reading 103 as 'one, zero, three' rather than 'one hundred and three').
- They may write three-digit numbers incorrectly (e.g. one hundred and thirty-four as 1034 or 10034).
- They may have difficulties with operations involving hundreds, even though they were confident of the same operation using tens and ones only.

The Unit 12 Let's Strengthen Suggestions for Teachers address the common misconceptions and difficulties listed above.

## Mathematical models and representations

- Interlocking cubes
- Base ten blocks
- Quick cubes (pictorial representations of base ten blocks)
- 100 squares
- Double ten frame
- Open number lines
- Branching bonds

- Bar models
- Place value grids
- Place value cubes
- Place value arrow cards
- Column method
- Number sentences
  - Number shapes

100

#### Open number line

#### **Teaching tip**

The following manipulative printables are available to support this unit: Base Ten Blocks, 100 Square, Double Ten Frame, Open Number Line, Branching Bonds, Bar Model, Place Value Grid, Place Value Counters and Place Value Arrow Cards. Click on the resources icon on the *Maths and Me* book cover on **edcolearning.ie** 



#### Day 1, Lesson 1

# Subtracting Through Tens (within 100)

#### Focus of learning (with Elements)

- Explores subtraction through 10, within 100 (U&C)
- Describes mental strategies used to compute (C)

#### **Learning experiences**

- Game: Ping-pong Number Bonds of 10
- D Digital activity: The Birthday Party (1) *MAM* Routines: Notice & Wonder, with Think-Pair-Share; Reason & Respond
- Digital activity: Apples *MAM* Routines: Would This Work?, with Build it; Sketch it; Write it
- D Digital activity: Oranges *MAM* Routines: Reason & Respond, with Build it; Sketch it; Write it
- Digital activity: Subtraction Through Tens (1) MAM Routines: Number Strings, with Write-Hide-Show
- Pupil's Book page 76: Subtracting Through Tens

#### Equipment

- Countable resources, such as interlocking cubes, place value grids, place value counters and base ten blocks
- Counting aids, such as 100 squares, ten frames and open number lines

#### Maths language

 subtracting, minus, take-away, count back (–), is equal to/equal(s) (=), bonds, how many, how many more, tens, number story, number sentence, branching, branching bond, related facts, estimate, reasonable, check, inverse, efficient

#### **Teaching tip**

While there are no specific lessons in this unit that are dedicated to estimating numbers and checking calculations, embed these strategies by routinely asking the children to estimate a reasonable answer (e.g. *Is it forty-something, fifty-something or sixty-something?*), and encourage them to check their answers (e.g. by solving the same calculation a different way, using the inverse operation) at every available opportunity in all units.

## Warm-up

#### Game: Ping-pong Number Bonds of 10

Play an imaginary game of tennis or ping-pong. Mime the first serve and call out a number within 10 (e.g. 3). The children mime the return and call out the number needed to make 10 (7). Then you 'bat back' with another number the children respond to.

#### Let's deepen

Call out a number from a different number range (e.g. 10 to 19; 20 to 29; 30 to 39). The children respond with the number needed to make this number up to the next multiple of 10.

## Main event



Display the poster. Using Think-Pair-Share to gather feedback, click to play or ask:



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

Note any 'wonderings' that could become the basis for a subsequent maths investigation.

Then, click to play or ask the following questions, asking the children to give reasons for their responses:

- Where are the children? What are they doing?
- How many apples are in each bag?
- How many apples altogether?
- Estimate how many oranges are in a box.
- If there are 10 oranges in each box, how many oranges in total?
- What is the highest number of children that can be in the soft-play area?
- How many children are currently in the soft-play area?
- How many more children can be in the soft-play area?
- Think of a question to ask about the poster, starting with 'How many...?'
- Think of a question to ask about the poster, starting with 'How many more ...?'

#### Digital activity: Apples *MAM* Routines: Would This Work?, with Build it; Sketch it; Write it

#### **Teaching tip**

Encourage the children to use the open number line(s) on their MWBs to model subtraction, as counting back through the ten.

Display the resource, in which the characters are taking a break from running around at the birthday party. There are three bags of ten apples. Each character eats an apple. Say/ask:

- How might we represent and solve this number story?
- Build it: Can you use classroom resources to represent this number story? Show us.
- Sketch it: Can you represent this number story as a sketch? Show us.
- Write it: Can you use words, branching bonds or number sentences to represent this number story? Show us.
- Is there more than one way to write a number sentence?
- Quickly estimate a reasonable answer. Do you think it will be twenty-something, thirtysomething or forty-something? Explain why.
- How many apples are left? How do you know?
- Would this work? (Click to reveal the first set of images.)

Next, click to display the various models and approaches chosen by the characters, allowing the children time to comment on each (e.g. *What is the same/different about each?*), and to justify whether the characters' methods/opinions work. Ask:

- Do the answers and/or approaches look reasonable? Explain why.
- How could we check the answers? (e.g. by solving the same calculation a different way, using the inverse operation)
- Which is the most efficient way to arrive at an answer, in your opinion?

#### **Teaching tip**

The characters' solutions should not be presented to the class as the only 'correct' ways to solve questions. If the children come up with their own solutions that arrive at the correct answer, these are just as valid as those presented by the characters and should be acknowledged as so. If a child uses a strategy not already on the Strategy Wall, this could be added.

#### Digital activity: Oranges MAM Routines: Reason & Respond, with Build it; Sketch it; Write it

Display the image, which shows four crates of ten oranges with three extra oranges beside them. Say/ask:

- The children each take two oranges. How might we represent and solve this number story?
- Build it: Can you use classroom resources to represent this number story? Show us.
- Sketch it: Can you represent this number story as a sketch? Show us.
- Write it: Can you use words, branching bonds or number sentences to represent this number story? Show us.
- Is there more than one way to write a number sentence?
- Quickly estimate a reasonable answer. Do you think it will be twenty-something, thirtysomething, forty-something, or fifty-something? Explain why.
- How many oranges are left? How do you know?

#### Let's strengthen

The children may benefit from first reviewing how to subtract through ten with smaller numbers (from numbers 11 to 19, subtracting an amount that requires crossing the ten). They can explore this using concrete materials (e.g. ten frames and counters, interlocking cubes). (See the Unit 12 Let's Strengthen Suggestions for Teachers.)

#### Digital activity: Subtraction Through Tens (1) MAM Routines: Number Strings, with Write-Hide-Show

This presentation contains two number strings. Each slide will build up a number string. Display the presentation in slideshow mode, so that only one part of the number string is revealed at a time. Ask the children to record their proposed answer only on their MWBs, using Write-Hide-Show. Emphasise that during the 'hide' stage, they should consider their strategy and other strategies that might work. Record all the children's answers on the board, being careful not to give away the correct answer. Ask:

 Are there any answers that are unreasonable/ unlikely because they don't make sense? Which ones? Why do you think this? (e.g. Is the answer too big or too small because the incorrect operation was used?)

- Which answer do you think is correct? What strategy did you use?
- Does anybody have a different proof?

Models that reflect, rather than direct, children's thinking: Use concrete materials and/or pictorial representations to model the approaches and strategies shared, so as to make them more visible to all of the class.

Repeat with the next parts of the number string. Repeat with other slides as required.

#### Let's strengthen

The children may need to be reminded to look at the bigger number and to consider how much needs to be taken from that number to bring it back to the previous 'friendly' (multiple of) ten.

Pupil's Book page 76: Subtracting Through Tens



## **Optional consolidation and extension possibilities**

**Integration** English: Explore the theme of birthdays, special events, etc. Gaeilge: An téama breithlá, ocaidí speisialta. Understanding of addition and subtraction can also be reinforced in other subjects, but especially in measuring, recording and communicating findings in STEM.

**Number Display** The children contribute further samples of their own work from this unit to the Number Display.

#### Games Bank Play 'Make 10'.

**Strategy Wall** Add the Calculation Strategy Wall Cards for Making Tens to the class Strategy Wall, if not already added. Refer to it throughout this and subsequent units. The children could also add their own sketches of this strategy to the display and their Maths Journals. **Story** Read *Subtraction Action* by Loreen Leedy, which explores subtraction (from one-digit up to two-digit numbers, including renaming) through the activities of animal characters at a school fair. It includes problems for the reader to solve.

**Online Tool** Virtual base ten blocks can also be used on devices (if available). See edco.ie/m9w5

**Review and Reflect** Use the Prompt Questions Poster.

#### Days 2 and 3, Lesson 2

# **Subtracting with Renaming**

#### Focus of learning (with Elements)

- Subtracts numbers with renaming (U&C)
- Develops strategies for efficient computation of subtraction (R)

#### **Learning experiences**

Digital activity: Subtraction Through Tens (2) MAM Routines: Number Strings, with Write-Hide-Show

Digital activity: Balloons (1) MAM Routine: Three-Act Task

- Digital activity: Balloons (2) *MAM* Routines: Would This Work?, with Build it; Sketch it; Write it
- Concrete activity: Column Method MAM Routine: I Do, We Do, You Do
- 🕑 Pupil's Book page 77: Subtracting with Renaming

#### Equipment

- Countable resources, such as interlocking cubes, place value grids, place value counters, and base tens blocks
- Counting aids, such as 100 squares and open number lines

#### renaming, column method, ones

#### **Teaching tip**

**Maths language** 

While, strictly speaking, the children have already been renaming in the previous lesson by going through tens, renaming in subtraction typically refers to decomposing or exchanging a ten for ten ones, and is typically associated with written calculations using the column method.

## Warm-up

#### Digital activity: Subtraction Through Tens (2) MAM Routines: Number Strings, with Write-Hide-Show

This presentation contains two number strings. Each slide will build up a number string. Display the presentation in slideshow mode, so that only one part of the number string is revealed at a time. Ask the children to record their proposed answer only on their MWBs, using Write-Hide-Show. Emphasise that during the 'hide' stage, they should consider their strategy and other strategies that might work. Record all of the children's answers on the board, being careful not to give away the correct answer. Ask:

 Are there any answers that are unreasonable/ unlikely because they don't make sense? Which ones? Why do you think this? (e.g. Is the answer too big or too small because the incorrect operation was used?)

- Which answer do you think is correct? What strategy did you use?
- Does anybody have a different proof?

Models that reflect, rather than direct, children's thinking: Use concrete materials and/or pictorial representations to model the approaches and strategies shared, so as to make them more visible to all of the class.

Repeat, with the next parts of the number string. Repeat with other slides as required.

#### Let's strengthen

The children may need to be reminded to look at the bigger number and consider how much needs to be taken from that number to bring it back to the previous 'friendly' (multiple of) ten.

## Main event

Digital activity: Balloons (1) MAM Routine: Three-Act Task

#### Act 1: Notice & Wonder

Play the video, which shows a number of inflated balloons. Then, some can be heard popping.



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

- What do you notice?
- What do you wonder? (Record the children's responses to both questions on the board. Allow the children the opportunity to agree/disagree with or query others' responses, but don't confirm or reject any of the ideas.)
- (Reveal the focus question.) How many balloons are left?

#### Act 2: Productive Struggle

Look at the image, which shows the blown-up balloons left on the floor. Click to play or ask:

- Write an estimate that is too high on your MWB.
- Write an estimate that is too low.
- Write a reasonable estimate.

The children work in pairs or small groups to answer the focus question. If necessary, prompt them by clicking to play or asking:

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

Once the children explain that they need to know (how many balloons there were in the beginning), click to flip the image. Looking at the second image (which shows empty packets of balloons and some burst balloons), ask:

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

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, solutions and models. Click to play or ask:

- What answer did you get?
- What strategies did you use to get the answer?
- What do you think was the most efficient strategy?

Click to reveal the final image, which shows the remaining balloons, all organised into groups of ten. 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?
- Digital activity: Balloons (2) MAM Routines: Would This Work?, with Build it; Sketch it; Write it

Begin by referring back to the Act 1 video in the Three-Act Task. Ask/say:

- Did anyone use the column method to solve the problem? Show us.
- (If no one used the column method:) Try the column method. Would it work? Show us.

Then display the Balloons (2) activity, which shows 45 balloons. Ask/say:

- Imagine that 17 balloons had popped. How might we represent and solve this number story?
- Build it: Can you use classroom resources to represent this new number story? Show us.
- Sketch it: Can you represent this number story as a sketch? Show us.
- Write it: Can you use words, branching bonds or numbers to represent this number story? Show us.
- Quickly estimate a reasonable answer. Do you think it will be twenty-something, thirtysomething, forty-something or fifty-something? Explain why.

Next, click to reveal the various models and approaches, allowing the children time to comment on each (e.g. *What is the same/different about each?*), and to justify whether the methods/opinions work.

Ask:

- Do the answers and/or approaches look reasonable? Explain why.
- How could we check the answers?
- Which is the most efficient way to arrive at an answer, in your opinion?
- What if 27 balloons had popped?

#### Concrete activity: Column Method MAM Routine: I Do, We Do, You Do

Demonstrate to the children how to use the column method to subtract a one-digit number from a two-digit number, using I Do, We Do, You Do with randomly generated numbers or adapted from those on page 77 of the Pupil's Book. For example:

I Do: Model the approach. Use both the column method and sketches of quick cubes as a visual support. Explain your thinking processes (think aloud) and explain why you are doing each step of the process.

We Do: Ask the children to complete similar calculations in pairs or small groups. They can turn their MWBs to landscape orientation and use the same approach as that modeled on the board.

You Do: When ready, ask the children to undertake similar questions independently. These can include those on page 77 of the Pupil's Book.

When ready, repeat this process, subtracting a two-digit number from a two-digit number.

#### Let's strengthen

The children may benefit more from using concrete resources, rather than sketching, and from using interlocking cubes that they can physically decompose into tens, as opposed to base ten blocks where a 'swap' has to occur.

#### Pupil's Book page 77: Subtracting with Renaming

**Note:** There are some examples on this page that do not require renaming. These have been deliberately included to



ensure that the children are considering each set of numbers and not just renaming them all.

#### Let's strengthen

The children may benefit from being able to use Let's Strengthen PCM, where the calculations are represented using cubes.

#### **Teaching tip**

Error analysis: Record (jot down or photograph) any mistakes that are being made. Present these as anonymous error(s) to the class on the board. Using Think-Pair-Share, ask the children to identify the error(s) and suggest what tips they might offer this person (e.g. suggest that they use concrete and/or pictorial supports; explain what was done incorrectly).

# **Optional consolidation and extension possibilities**

**Games Bank** Play 'Pig', 'Dice Darts (start at 101)' and/or 'Chance Calculations: Subtracting Ones/ Subtracting Tens and Ones'.

**Strategy Wall** Add the Calculation Strategy Wall Cards for Subtracting with Renaming, Using the Column Method, to the class Strategy Wall, if not already added. Refer to it throughout this and subsequent units. The children could also add their own sketches of this strategy to the display and their Maths Journals. **Story** Read *Shark Swimathon* by Stuart J. Murphy, which explores subtraction of two-digit numbers, with and without renaming, through the activities of the characters at swim camp.

**Let's Deepen** Task A and B on the PCM can be done any time after this lesson.

**Review and Reflect** Use the Prompt Questions Poster.

# Day 4, Lesson 3 Bonds of 100

#### Focus of learning (with Elements)

- Fluently recalls bonds of 100 (multiples of 10) (C)
- Uses knowledge of simple fact groups (bonds of 10) to develop further calculation strategies (bonds of 100) (R)

#### Learning experiences

- Game: Ping-pong Number Bonds of 100
- Digital activity: Balloons (3) *MAM* Routines: Would This Work?, with Build it; Sketch it; Write it
- Pupil's Book page 78: Bonds of 100

#### Equipment

- Countable resources, such as interlocking cubes, place value grids, place value counters, and base ten blocks
- Counting aids, such as 100 squares and open number lines
- Number shapes

#### Maths language

hundred, left, in the beginning, used

## Warm-up

#### 🕝 Game: Ping-pong Number Bonds of 100

Digital activity: Balloons (3)

Display the activity, which shows 65

balloons that came from a bag of 100

**Sketch it; Write it** 

Play an imaginary game of tennis or ping-pong. Mime the first serve and call out a multiple of 10 within 100

MAM Routines: Would This Work?, with Build it;

(e.g. 30). The children mime the return and call out the number needed to make 100 (70). Then you 'bat back' with another number the children respond to.

## Main event

#### **Teaching tip**

If not suggested, encourage the children to use the open number line(s) on their MWBs to model bonds of 100.

• Write it: Can you use words, branching bonds or numbers to represent this number story? Show us.

Next, click to display the various models and approaches chosen by the characters, allowing the children time to comment on each (e.g. *What is the same/different about each?*), and to justify whether the characters' methods/opinions work. Ask:

- Do the answers and/or approaches look reasonable? Explain why.
- How could we check the answers? (e.g. by solving the same calculation a different way, using the inverse operation)
- Which is the most efficient way to arrive at an answer, in your opinion?
- What if there were only 45/25 balloons left?

# balloons, and ask/say: How many balloons are left? How do you know?

- How many balloons were there in the beginning? How do you know?
- How could we find out how many balloons have been used?
- Estimate quickly a reasonable answer. Do you think it will be twenty-something, thirtysomething, forty-something or fifty-something? Explain why.
- Build it: Can you use classroom resources to represent this number story? Show us.
- Sketch it: Can you represent this number story as a sketch? Show us.

Repeat, as required, using other two-digit numbers ending in 5.

#### Let's strengthen

The children may benefit from initially working with multiples of ten only.

#### Let's deepen

Challenge the children with other numbers that are not multiples of 5 (e.g. 34, 72, 83).

## **Optional consolidation and extension possibilities**

**Let's Strengthen** Some children may benefit from further practice at partitioning 100, using concrete materials and pictorial representations. (See the Unit 12 Let's Strengthen Suggestions for Teachers.)

**Games Bank** Play 'Four Throws to 100' and/or 'Eight Throws to 200'.

**Strategy Wall** Add the Calculation Strategy Wall Cards for Bonds of 10 and Bonds of 100 to the class Strategy Wall, if not already added. Refer to it throughout this and subsequent units. The children could also add their own sketches of this strategy to the display and their Maths Journals. **Headline Story** Mia added two numbers to total 100. Neither number ended in 0 or 5.

Pupil's Book page 78:

Bonds of 100

**Online Game** Play 'Hit the Button' to practise number bonds of 10, 20 and 100. See edco.ie/u7sd

**Online Tool** Virtual maths rack/rekenrek can also be used on devices (if available) to model bonds of 100. See edco.ie/5srs

**Review and Reflect** Use the Prompt Questions Poster.

**Let's Deepen PCM** Tasks A and B can be done any time after this lesson.

#### Days 5 and 6, Lesson 4

# Adding and Subtracting Ones (100 to 200)

#### Focus of learning (with Elements)

- Uses number lines and benchmark numbers to count forwards and backwards (A&PS)
- Establishes the relationship between numbers and their position in a hundred square (R)
- Solves problems using known number facts and knowledge of mental strategies (A&PS)

#### Learning experiences

- Concrete activity: Filling Up the Square MAM Routine: Choral Counting
- Digital activity: The Birthday Party (2) *MAM* Routines: Would This Work?, with Build it; Sketch it; Write it
- Pupil's Book page 79: Adding and Subtracting Ones

#### Maths language

adding, add, count on (+), more, less, row, column, above, below

#### Equipment

- Countable resources, such as interlocking cubes, place value grids, place value counters, and base ten blocks
- Counting aids, such as 100 squares and number lines



#### **Teaching tip**

When verbalising numbers above 100, resist the temptation to read the numbers as a series of digits, as we are used to doing with phone numbers. For example, reading 103 as 'one hundred and three' reinforces the place value of each digit, whereas reading 103 as 'one, zero, three' does not. Similarly, be careful not to read zero (0) as 'o', which is a letter of the alphabet, rather than a digit/number.

## Warm-up

#### Concrete activity: Filling Up the Square MAM Routine: Choral Counting

#### **Teaching tip**

This activity involves filling in some rows of a blank 100 square but using it as if it is for the numbers 101–200.

Say it, then see it: Display a blank 100 square grid on the board. Ask/say:

- (Point to the top left square.) What does this look like? What number do you think goes here?
- Imagine that I had already filled up a 100 square from 1 to 100, and wanted to continue counting on. What number would go here?
- Can you predict what number will come next? How do you know?
- Say the rest of this row forwards as I write. What patterns do you spot?

Repeat with the next rows, as required, until the children appear to be confident at counting forwards.

- (Point at an end-of-row square not already filled in.) What is the number that goes at the end of this row? How do you know?
- Can you predict what number will come before this? How do you know?
- Say the rest of this row backwards as I write. What patterns do you spot?

Repeat with other rows, as required, until the children appear to be confident.

#### Let's strengthen

The children may need to refer to the 101–200 square on the inside cover of the Pupil's Book.

#### Let's deepen

Challenge the children further by asking them to complete a column upwards or downwards and/or to complete a diagonal.

## Main event

#### Digital activity: The Birthday Party (2) MAM Routines: Would This Work?, with Build it; Sketch it; Write it

Display the resource, which shows that there are 125 children in the soft-play area. Ask:



 How many children are in the soft-play area? How might we represent this number?

Then ask the children to use Build it; Sketch it; Write it to model and solve the question:

- If 8 more children enter the soft-play area, what number will there be then? How do you know?
- Allow time for the children to share how they did it.

#### **Teaching tip**

If the children do not suggest it themselves, encourage them to use the open number line(s) on their MWBs as one way to model the scenarios. Then click to display the various models and approaches chosen by the characters, allowing the children time to comment on each (e.g. *What is the same/different about each?*), and to justify whether the methods/opinions work. Ask:

- Do the answers and/or approaches look reasonable? Explain why.
- How could we check the answers?
- Which is the most efficient way to arrive at an answer, in your opinion?

#### **Teaching tip**

The characters' solutions should not be presented to the class as the only 'correct' ways to solve questions. If the children come up with their own solutions that arrive at the correct answer, these are just as valid as those presented by the characters and should be acknowledged as so. Other possibilities include using actual cubes or the 101–200 square on the inside cover of the Pupil's Book. If a child uses a strategy not already on the Strategy Wall, this could be added.

You could also ask:

- If 4 more children enter the soft play area, what number will there be then? How do you know?
- Build it; Sketch it; Write it: Show us one model to prove your answer. Explain your strategy.
- What if 5 children had come out of the play area before any entered? What number would there be then? How do you know?
- Build it; Sketch it; Write it: Show us one model to prove your answer. Explain your strategy.
- What if 9 children had come out of the play area before any entered? What number would there be then? How do you know?

- Build it; Sketch it; Write it: Show us one model to prove your answer. Explain your strategy.
- Pupil's Book page 79: Adding and Subtracting Ones



#### Let's strengthen

The children may benefit from being able to access visual counting supports and concrete resources to complete the page.

## **Optional consolidation and extension possibilities**

**Games Bank** Play 'Target 50' or 'Target Zero' (one dice).

**Strategy Wall** Add the Calculation Strategy Wall Cards for Adding 1 or 2 and Subtracting 1 or 2 to the class Strategy Wall, if not already added. Refer to it throughout this and subsequent units. The children could also add their own sketches of this strategy to the display and in their Maths Journals.

**Estimation Station** Fill a transparent container with between 100 and 200 small items of two different colours. Leave a box close by, where children can 'post' their estimated number sentences. After 2 or 3 days, ask a group to count each colour group and identify who had the closest estimate for the two amounts (addends). Then set up the station again with a different number of items.

#### Let's deepen

Challenge the children to use addition, not counting, to total the two different colour groups.

**Home/School Links Book:** Page 28, 'Chance Calculations 2' Games 1 and 2 can be played at any stage after this lesson. Cover the page with a clear acetate sheet so that the game can be played repeatedly.

**Online Tools** Virtual place value counters can also be used on devices (if available) to model bonds addition of ones (and tens in the next lesson) onto three-digit numbers. See edco.ie/2v6y

**Review and Reflect** Use the Prompt Questions Poster.

Days 7 and 8, Lesson 5

# Adding and Subtracting Tens (within 200)

#### Focus of learning (with Elements)

- Explores addition and subtraction of tens, within 200 (U&C)
- Draws from patterns and properties to derive unknown number facts from core facts (A&PS)

#### Learning experiences

- C Concrete activity: Counting in 10s MAM Routine: Choral Counting
- Digital activity: The Birthday Party (3) *MAM* Routines: Would This Work?, with Build it; Sketch it; Write it
- Concrete activity: Adding and Subtracting Tens MAM Routines: Reason & Respond, with Write-Hide-Show
- Pupil's Book page 80: Adding and Subtracting Tens

#### Equipment

- Countable resources, such as interlocking cubes, place value grids, place value counters, and base ten blocks
- Counting aids, such as 100 squares and open number lines
- Place value arrow cards

#### Maths language

There is no new maths language for this lesson.

## Warm-up

#### Concrete activity: Counting in 10s MAM Routine: Choral Counting

See it, then say it: Using the 100–200 square on the inside cover of the Pupil's Book, the children practise counting forwards and/or backwards in unison, in 10s from a random three-digit number. Ask the children if they can spot any patterns. Repeat as required.

See it, then say it: Ask the children to count forwards and/or backwards in unison, in 10s from a random number, within 200. (Initially choose a range that does not require crossing 100.) As they say each number, record it on the board. Stop at regular intervals and ask:

Can you spot any patterns?

• Can you predict what will come next? How do you know?

Repeat as required.

#### Let's strengthen

The children may need to refer to the 100 square and/or 101–200 square on the inside cover of the Pupil's Book.

#### Let's deepen

As the children become more confident and competent, challenge them further by choosing a range that requires crossing 100.

## Main event

#### Digital activity: The Birthday Party (3) MAM Routines: Would This Work?, with Build it; Sketch it; Write it

Display the resource, which shows that there are 125 children in the soft-play area. Before you play the first part of the activity. ask:



- activity, ask:If a group of 10 children arrived, how many
- children would there be then?
- Build it; Sketch it; Write it: Show us one model to prove your answer. Explain your strategy.
- If 10 children left, how many children would there be then?
- Build it; Sketch it; Write it: Show us one model to prove your answer. Explain your strategy.

Then click to play the first part of the activity. Ask:

• If a group of 40 children left, how many children would there be then? (125 - 40 = ?)

Allow time for the children to share how they did it.

#### **Teaching tip**

If the children do not suggest it themselves, encourage them to use the open number line(s) on their MWBs as one way to model the scenarios.

Next, click to display the various models and approaches chosen by the characters, allowing the children time to comment on each (e.g. *What is the same/different about each?*), and justify whether the methods/opinions work. Ask:

 Do the answers and/or approaches look reasonable? Explain why.

- How could we check the answers?
- Which is the most efficient way to arrive at an answer, in your opinion?

You could also ask:

- If there were 98 children and 30 more children arrived, how many children would there be then?
- Build it; Sketch it; Write it: Show us one model to prove your answer. Explain your strategy.

#### Let's strengthen

The children may benefit from using:

- Place value arrow cards to physically decompose the three-digit number into its place value parts.
- MAM Routine 'I Do, We Do, You Do' to demonstrate how to use the column method for adding tens, without and with renaming hundreds.

#### Concrete activity: Adding and Subtracting Tens MAM Routines: Reason & Respond, with Write-Hide-Show

100 square: Direct the children to turn to the 100 square and the 101–200 square on the inside cover of the Pupil's Book. Pick a random number. (Initially choose a range that does not require crossing 100.) Ask the children to use their finger to locate this number, and then record their answer on their MWB, using Write-Hide-Show. After each response, ask individual children to justify/prove their answer. Possible questions include:

- What is 10 more than this number? How do you know?
- What is 10 less than this number? How do you know?
- What is 20/30/40 ... more than this number? How do you know?
- What is 20/30/40 ... less than this number? How do you know?

Repeat, as necessary, with other random numbers.

#### Let's deepen

As the children become more confident and competent, challenge them further by choosing a range that requires crossing 100 (e.g. 89 + 20; 134 - 40). Development: Pick a random number, but instead of looking at the 100 square, the children try to visualise it to help them write down a response. After sharing their proposed answers, the children use their 100 squares to check the answer(s).

Quick Cubes: As above, pick a random number, but ask the children to sketch the answer to a follow-up question as quick cubes on their MWBs. For example:

Draw 20 more/less than this number.

#### Let's strengthen

The children may benefit from being able to manipulate actual base ten blocks as opposed to pictorial representations of them.

Pupil's Book page 80: Adding and Subtracting Tens



#### Let's strengthen

The children may benefit from being able to work in pairs and to access supports such as the 100 square and base ten blocks to complete the page. Encourage them to verbalise to each other what they are doing and what is happening to the numbers involved.

#### Let's deepen

Challenge the children to visualise, rather than using or drawing representations, to arrive at the answers.

# **Optional consolidation and extension possibilities**

**Games Bank** Play 'Cross-Out Tens Totals' (three dice) or 'Dice Darts'.

**Online Games** Play 'Maths Invaders' Year 2 and appropriate Year 3 games to practise addition and subtraction skills. See edco.ie/pbfp

**Strategy Wall** Add the Calculation Strategy Wall Cards for Adding 10 and Subtracting 10 to the class Strategy Wall, if not already added. Refer to it throughout this and subsequent units. The children could also add their own sketches of this strategy to the display and in their Maths Journals. **Estimation Station** Remind the children to submit estimates, count the items and/or set up a new station.

**Home/School Links Book** Page 29 'Chance Calculations 2' Games 3–5 can be played at any stage after this lesson. Cover the page with a clear acetate sheet so the game can be played repeatedly.

**Let's Deepen** Tasks C and D on the PCM can be done any time after this lesson.

**Review and Reflect** Use the Prompt Questions Poster.

#### Day 9, Lesson 6

# **Finding Difference (within 200)**

#### Focus of learning (with Elements)

Explores subtraction as comparison/difference (U&C)

#### Learning experiences

- C Concrete activity: Counting in 10s MAM Routine: Choral Counting
- D C Digital activity: Bowling Scores *MAM* Routines: Notice & Wonder; Reason & Respond, with Build it; Sketch it; Write it
- Pupil's Book page 81: Finding Difference

#### Equipment

- Countable resources, such as interlocking cubes, place value grids, place value counters, and base ten blocks
- Counting aids, such as 100 squares and open number lines

#### Maths language

compare, difference, chunks

## Warm-up

#### C Concrete activity: Counting in 10s MAM Routine: Choral Counting

Say it, then see it: As in yesterday's lesson, ask the children to count forwards and/or backwards, in unison, in 10s from a random number, within 200. (Initially choose a range that does not require crossing 100.) As they say each number, record it on the board. Stop at regular intervals, and ask:

- Can you spot any patterns?
- Can you predict what will come next? How do you know?

#### Let's strengthen

The children may need to refer to the 100 square and/or 101–200 square on the inside cover of the Pupil's Book.

#### Let's deepen

As the children become more confident and competent, challenge them further by choosing a range that requires crossing 100.

Repeat as required.

## Main event

#### **Teaching tip**

It is not essential that the children use the column method to find the difference between numbers, especially for numbers over 100, where renaming is required. Using/drawing a number line on which to count up to find the difference is perfectly acceptable.

#### Digital activity: Bowling Scores MAM Routines: Notice & Wonder; Reason & Respond, with Build it; Sketch it; Write it

This slideshow shows the bowling scores from the game at the birthday party. Reveal the first slide, which shows the scores after the characters have all bowled once. Ask:

• What do you notice? What do you wonder?

If not suggested, explain that the characters went bowling and these are the results.

Reveal the second, third and fourth slides and ask the same questions.

Before revealing the fifth/final slide, ask/say:

- Who has the most points?
- Who has the least points?

- Estimate the difference between the highest score and the lowest score. Is the difference closest to 10, 20, 30, 40, 50 ... etc?
- What is the difference between the highest score and the lowest score?
- Build it; Sketch it; Write it: Show us one model to prove your answer. Explain your strategy. (Prompt the children to suggest a range of appropriate strategies and models.)

#### **Teaching tip**

If the children do not suggest it themselves, encourage them to use the open number line(s) on their MWBs to model the differences.

Pupil's Book page 81: Finding Difference



## **Optional consolidation and extension possibilities**

**Headline Story** Dara found the difference between 2 two-digit numbers.

Games Bank Play 'Difference Snap'.

**Strategy Wall** Add the Calculation Strategy Wall Cards for Adding Up in Chunks and/or Adding to Subtract to the class Strategy Wall, if not already added. Refer to it throughout this and subsequent units. The children could also add their own sketches of this strategy to the display and in their Maths Journals. **Estimation Station** Remind the children to submit estimates, count the items and/or set up a new station.

**Online Tools** Virtual number lines can also be used on devices (if available) to model difference. See edco.ie/39z7

**Online Activities** Practise solving addition and subtraction skills using bar models. See edco.ie/54jk

**Review and Reflect** Use the Prompt Questions Poster.

# Day 10, Lesson 7 Review and Reflect

#### Focus of learning (with Elements)

Reviews and reflects on learning (U&C)

## Warm-up

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

## Main event

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

Let's talk!	Let's play!
Use Think-Pair-Share to review the unit. Individual children could present examples of their own drawings/work/constructions to the class, and talk about what they have learned. The children record what they know in their Maths Journals (e.g. using a concept map).	Play any of the games listed under Optional Consolidation and Extension Possibilities.
Maths language	Maths strategies and models
Ask the children to explain the following terms (perhaps using examples or drawings on their MWBs): adding, subtracting, is equal to/equals (+, -, =), fact family, branching bond, inverse, tens, ones, hundred, count on/back, column method, branching, related facts, number story, number sentence, estimate, reasonable, check, inverse, efficient, renaming, left, in the beginning, used, compare, difference. Use the Unit 12 Maths Language Cards to revise key terms. For example: if the image and text are cut apart, can the children match them? Complete the My Maths Fact File on pages 121 and 122 of the Pupil's Book.	Ask the children to give examples of the strategies they used in this unit (e.g. how to add/subtract ones, tens, without and with renaming, adding three numbers, using friendly numbers). Ask the children to give examples of the models they used in this unit (e.g. concrete materials such as interlocking cubes, place value grids, base ten blocks, their own fingers, 100 square), pictorial representations (e.g. quick cubes, number lines), and abstract models (branching, number sentences, column method). Which strategies and models did they prefer and why?
Progress Assessment Booklet	Maths eyes
Complete Questions 45–47 on page 22. Alternatively, these can be left to do as part of a bigger review during the next review week.	Ask the children to identify situations in the classroom or school where they could use their addition and subtraction skills (e.g. total number of children in certain rooms, comparing the numbers of children in classes).
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 12 Let's Strengthen PCM. Consult the Unit 12 Let's Strengthen Suggestions for Teachers.	Use the Unit 12 Let's Deepen PCM.


