Maths and Me: 2nd Class – Short-Term Plan, Unit 13: Measuring 2 (March 3&4)

Measures > Measuring.

Strand(s)> Strand Unit(s)

Learning C	Dutcome(s)	Through appropriately playful and engaging learning experiences children should be able to compare, approximate and record using appropriate units of measurement.	d measure length, weight, capacity and area using a	ppropriate instruments
Lesson		Focus of Learning (with Elements)	CM Learning Experiences	Assessment
-	Measuring Weight:	: Devises strategies to measure the attributes of a wide range of objects (A&PS)	 Notice & Wonder L1, 3 O O D Think-Pair-Share L1-7 O O Reason & Respond L1-7 	Intuitive Assessment: responding to emerging
2	Kilograms: Identific using kilograms and	es the kilogram (kg) as a standard unit for weight (U&C); Discusses and records estimations and measurements, I symbols (e.g. kg) (C)	 Write-Hide-Show L1–2 O O Would This Work? L3–4, 6 Three-Act Task L2, 4 	
m	Measuring Capacit	:y: Devises strategies to measure the attributes of a wide range of objects (A&PS)	 D Build it; Sketch it; Write it L2, 4, 6 D P Concept Cartoon L4, 7 Measuring Weight L1 	Planned Interactions: responding to insights gleaned from
4	Litres: Identifies the and symbols (e.g. l)	e litre (l) as a standard unit for capacity (U&C); Discusses and records estimations and measurements using litres .(C)	Which Has the Greater Capacity? L3 Print resources Dunit's Rook narree 82–87	children's responses to learning experiences
ъ	Comparing and Orc using the same stan	dering Measures: Makes comparative statements or judgements (C); Compares the measurements of objects, ndard unit (U&C)	Home/School Links Book pages 30–31 PCM 38–40	Assessment Events:
و	Operations with Micone contexts where app	easures: Solves single and multi-step problems involving addition and subtraction of measures (using real-life propriate) (A&PS)		information gathered from completion of the unit assessment in the Progress
7	Classroom Olympi Uses base units and	cs : Evaluates the reasonableness of measurements with reference to estimations and personal benchmarks (R); I appropriate instruments to solve rich practical tasks and problems involving measurement (A&PS)		Assessment Booklet pages 23–24
œ	Review and Reflect	t: Reviews and reflects on learning (ሀ&ር)		
	Key: El	lements: (U&C) Understanding and Connecting; (C) Communicating; (R) Reasoning; (A&PS) Applying and Problem-:	ving. CM: Cuntas Míosúil: please tick when you	

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have completed the focus of learning. Learning Experiences: 🖸 concrete activity; 🖸 digital activity; 🕑 activity; 🕑 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 13 Maths Language Cards.
Equipment	See '2nd Class Maths and Me Equipment Overview' and individual lesson plans.
Inclusive Practices	 See Let's Strengthen and Let's Deepen suggestions throughout lesson plans. See Unit 13 Let's Strengthen Suggestions for Teachers. (These address the Common Misconceptions and Difficulties listed below.) See Unit 13 Let's Strengthen PCM. See Unit 13 Let's Deepen PCM.
Integration	See individual lesson plans.

Background and rationale

- This unit continues on from Unit 10 (which explored the attributes of length, including width and height) to focus on the attributes of weight and capacity. As such, it reflects many of the same learning experiences in the progression continua addressed in Measuring 1, as well as extending these in a very integrated way. By Measuring 3, all of the learning experiences in the progression continua pertaining to measuring will have been addressed, at least once.
- Strictly speaking, the term *mass* is more correct than the term *weight* (since mass is measured in kilograms and grams). However, in *Maths and Me*, we use the term *weight*, as that is the term used in the Primary Maths Curriculum (2023), as well as being the term most frequently used by the general population.
- As with all measuring activities, it is not enough for the children to be looking at and talking about measures; they need to engage in lots of practical experiences, where they get to manipulate these measures so as to be able to relate them to themselves.
- As is the practice with all estimation activities, the children estimate one object at a time, and then measure that object, before estimating and measuring the next object (i.e. they do not do all the estimation and then do all the measuring). In this way the children can refine their estimate each time, based on what they learned from the previous object.
- With regard to the introduction of standard units of measurement for weight and capacity, *Maths and Me* incorporates the following progression, which reflects that which has traditionally occurred in Irish classrooms:
 - 1st Class: kilogram and litre
 - 2nd Class: halves and quarters of kilograms and litres (including fractional notation, i.e. $\frac{1}{2}$, $\frac{1}{4}$)

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

Common misconceptions and difficulties

- The children may not have a sense of how heavy a kilogram is, or how much liquid is in a litre. Therefore, they are unable to use these as benchmarks for estimation. The children need lots of practical experience in manipulating these measures so that they can relate to them.
- The children may struggle with some of the key mathematical language.

Common misconceptions and difficulties

- They may not appreciate that, when measuring using multiple non-standard units, the objects being used must be uniform.
- They may not realise that it is most efficient to use smaller units and smaller scales for measuring small objects, and bigger units and bigger scales for measuring larger items.
- They may not recognise that, when measuring the same item, as the size of the units being used increases, the count of the units decreases.
- They may incorrectly accept size/and or shape as a reliable indicator of weight or capacity. For example:
 - They may incorrectly assume that bigger objects are always heavy and smaller objects are always light.
 - They may incorrectly assume that objects of the same size should weigh the same.
 - They may struggle to see that containers of different shapes can have the same capacity.
- They may not appreciate the importance of context, e.g. a sofa is heavy when compared to a cushion, but light when compared to an elephant.
- They may misread a balance, i.e. think that the side that is higher holds the heavier item(s).
- They may miscount when counting/measuring the weight/capacity of something using non-standard units.
- They may confuse the amount a container can hold (i.e. its capacity) with the amount currently in the container/how full it is (i.e. its volume).
- They may not understand that if A is greater than B and B is greater than C, then A must be greater than C.
- They may struggle to apply proportional reasoning. For example: If 1 jar = 2 cups, and 3 jars = 1 bowl, then 1 bowl = ? cups.
- They may confuse or misinterpret inequality symbols (i.e. <, >) and/or struggle to understand inequality statements using more than two terms (e.g. A > B > C).
- They may be unsure how to deal with fractions of a unit, when the count is not equal to a whole number.
- They may not recall that there are two halves in a whole and four quarters in a whole, and/or be unable to apply this concept to kilograms and litres.
- They may struggle to read or interpret fractional notation (i.e. $\frac{1}{2}$ as half, $\frac{1}{4}$ as quarter).

The Unit 13 Let's Strengthen Suggestions for Teachers address the common misconceptions and difficulties listed above.

Mathematical models and representations

- Balances (not scales), such as a bucket balance, pan balance, clothes hanger balance (i.e. two bags of uniform size on either side of a wooden clothes hanger)
- Representations of classroom-based resources which could be used as weighing units, (e.g. cubes, blocks)
- Representations of various types of containers of different sizes and capacities, including cups, glasses, bottles, jugs and buckets
- Models for operations (e.g. bar models, number lines, cubes, base ten blocks, place value grids)





Teaching tip

A Balance manipulative printable is available to support this unit. Click on the resources icon on the *Maths* and *Me* book cover on **edcolearning.ie**

Day 1, Lesson 1 Measuring Weight

Focus of learning (with Elements)

Devises strategies to measure the attributes of a wide range of objects (A&PS)

Learning experiences

- Digital activity: The Supermarket (1) MAM Routines: Notice & Wonder, with Think-Pair-Share; Reason & Respond, with Write-Hide-Show
- C Concrete activity: Stacking Shelves MAM Routine: Reason & Respond, with Think-Pair-Share
- Concrete activity: Measuring Weight
 - Pupil's Book page 82: Measuring Weight

Equipment

- Per group: Clothes hanger balance (i.e. wooden clothes hanger and two identical bags with handles)
- Various objects to weigh and to use as uniform non-standard units
- Bucket/pan balances

Maths language

• measure, weigh, weight, heavy, heavier, heaviest, light, lighter, lightest, balance scales, balanced, compare, estimate, units, less than (<), greater than (>), equals (=)

Teaching tip

It is important that the children realise that it is most efficient to use smaller units and smaller scales for measuring small items, and bigger units and bigger scales for measuring larger items. To this end, the children must experience weighing activities involving both smaller and larger items, so that they can explore and identify the most appropriate measurement instruments and non-standard units for each. These activities will largely depend on what resources are available to the class. The following are some suggestions.

Smaller items: stationery (scissors, pen, pencil), small toys (animals, cars), small fruit and vegetables (strawberry, grape, satsuma, baby potato), natural items (chestnuts, acorns, pinecones). These can be measured with a bucket balance or a pan balance using non-standard units of uniform weight (e.g. interlocking cubes, marbles, dice, coins, spools, wooden beads and bears).

Larger items: medium-sized fruit and vegetables (apple, orange, banana, carrot), footballs, beachballs, lunchboxes, books and larger toys. These can be measured with a clothes hanger and two identical bags using non-standard units of uniform weight (wooden blocks, copies of the same textbook/reader, golf balls, tennis balls, sliotars, bean bags).

Warm-up

Digital activity: The Supermarket (1) MAM Routines: Notice & Wonder, with Think-Pair-Share; Reason & Respond, with Write-Hide-Show

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

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

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

Main event

Digital activity: The Supermarket (1)

MAM Routines: Notice & Wonder, with Think-Pair-Share; Reason & Respond, with Write-Hide-Show

Display the poster. Ask the children to



answer the questions below and to give Opportunity reasons for their responses (some of these questions may have already been answered in the warm-up). Click to play or ask:

- Describe the picture using maths words.
- Use these phrases to talk about the picture: *weight, heavier than, lighter than.*
- What units of measure can be seen in the picture?
- The empty shelves need to be stacked. Why do you think there is a safety sign?
- Do you agree with the sign? Explain why.
- What items could be put on the bottom shelf?
- What items could be put on the top shelf?
- Do you think that the bags are the same weight? Explain why.
- Can you tell if something is heavy or light from a picture? Explain why.
- Would the beachball be heavier than the football? Explain why.

Concrete activity: Stacking Shelves MAM Routines: Reason and Respond, with Think-Pair-Share

With the previous poster still on display, draw the children's attention again to the empty shelves and the safety sign. Using Think-Pair-Share to collect feedback, ask:

- How could the floor assistant find out which items are the heaviest and which are the lightest?
- Would it work if the bigger items were placed on the bottom shelf and the smallest items were placed on the top shelf? Explain why.
- Could the items be hand weighed? How does this work?
- Could a clothes hanger balance be used? How does this work?
- What other ways could this be done?

As the children suggest possible methods, allow them to demonstrate their method to the class so that all the children benefit from seeing it.

Concrete activity: Measuring Weight For this activity, use any items available in the classroom (e.g. boxes, containers of items, lunch bags/boxes), as long as they are small enough to fit on either side of the bucket/pan balance or on the clothes hanger balance (i.e. fit in a bag). Tell each group of children to select and put some random items from the classroom on their desk. Without allowing the children to hold the items, ask:

- Which do you think is the heaviest? Explain why.
- Which do you think is the lightest? Explain why.
- Record your estimate on your MWBs. (How will you do this?)
- How can you find out?
- Could we find out an answer without using any equipment? How? (If necessary, demonstrate how to hand-weigh with outstretched arms.)
- What equipment could be used? How? (If necessary, demonstrate how to check, using a commercial balance or hanger balance.)
- What if we wanted to compare lots of items and to measure the weight of each? How might we do this? (If necessary, demonstrate how to measure the weight of the items in books or copies, using multiple copies of the same item.)

Allow the children time to work together, following this general procedure:

Look: Estimate which item is heavier by judging its appearance.

Lift: Lift and hold each item, one by one. Replace and amend estimates, if necessary.

Hand weigh: Compare two items by holding them in outstretched hands. Replace and amend estimates, if necessary.

Balance: Check using a commercial balance or hanger balance (i.e. two identical bags with handles, which can be hung from the end of the clothes hangers are large enough to take most items).

Teaching tip

You could also provide the children with copies of the Unit 13 Maths Language Cards (for 'greater than', 'less than', 'the same as'), which they could cut up and lay beside the balance depending on the result.

Give each group an opportunity to report back. Prompt the children to explain the weight relationship between two items. For example: 'This is heavier than that because this weighs ... (e.g. 6) books and that weighs only ... (e.g. 4) books.' Ask:

- What other units (instead of books/copies) could have been used? Explain why.
- Would books/copies work for smaller objects? Explain why.
- What units might work better? Explain why.

Let's strengthen

The children may need to be:

- Reminded that the units chosen must be uniform
- Explicitly shown that to order a number of objects, they must first compare two, and then compare one of those with another object, and so on.

Let's deepen

Challenge the children to record the weight of the items, using inequalities (e.g. A > B > C).

Pupil's Book page 82: Measuring Weight



Let's strengthen

Activity A: The children may:

- Be allowed to write 'R' for 'rice', 'G' for 'grapes', etc. to answer
- Need to review the meaning of the inequality symbols (<, >) (see Unit 13 Let's Strengthen Suggestions for Teachers)

Activity B: The children may:

- Be prompted to write 'H' (heavier) or 'L' (lighter) below each item on the balance.
- Need to use concrete resources to model the scenario (see the Unit 13 Let's Strengthen Suggestions for Teachers for more about proportional reasoning).

Optional consolidation and extension possibilities

Integration Language: English – the theme of the supermarket and shopping. Language: Gaeilge – an téama bia agus/nó an baile mór/ag siopadóireacht. Geography: Environmental awareness and care, measuring waste produced, water conservation, etc. STEM: Measuring capacity and weight as required in various STEM investigations.

Story Read *The Dragon's Scales* by Sarah Willson.

Games Bank Play the variation game 'Weight Estimate!' from the Unit 10 game 'Estimate!' Play as per 'Estimate!' except that the players estimate the number of units (e.g. cubes) that are equal to an item's weight.

Display Set up or add to a Weight Display. Include heavy and light objects and appropriate labels (e.g. the Unit 13 Maths Language Cards). The children contribute examples of their own work from this lesson and label them. **Guess What?** Provide some children with four identical non-transparent containers (e.g. ice cream tubs and sweet tubs), which they must then fill with items of various weight (e.g. cotton balls, sand, rice, leaves, feathers). Ask other children to identify what they think is in each container and order the containers. Then add these items to the classroom display (see above).

Maths Journal The children use images and/or words to record how they conducted the investigation and their findings.

Play Area Set up a station with various balances and materials, where the children can choose to explore weight further over the course of the unit.

Review and Reflect Use the Prompt Questions Poster.

Days 2 and 3, Lesson 2

Kilograms

Focus of learning (with Elements)

- Identifies the kilogram (kg) as a standard unit for weight (U&C)
- Discusses and records estimations and measurements, using kilograms and symbols (e.g. kg) (C)

Learning experiences

- Digital activity: Same But Different Measuring Weight MAM Routines: Reason & Respond, with Think-Pair-Share
- Video: The Kilogram MAM Routines: Reason & Respond, with Write-Hide-Show
- Digital activity: Greater or Less Than a Kilogram *MAM* Routine: Three-Act Task, with Build it; Sketch it; Write it
- 🕑 🕒 Pupil's Book page 83: Kilograms

Equipment

- Bucket/pan balances
- Weights and/or supermarket items that are 1 kilogram, a half kilogram and a quarter kilogram in weight, labelled
- Multiple identical maths books and maths copies
- A selection of different books

Maths language

• kilograms (kg), half $(\frac{1}{2})$, quarter $(\frac{1}{4})$, about

Warm-up

Digital activity: Same But Different – Measuring Weight MAM Routines: Reason & Respond, with Think-Pair-Share Display the slideshow. Using Think-Pair-Share, ask the children to propose reasons for why the images are the same and why they are different.

Main event

Video: The Kilogram MAM Routines: Reason & Respond, with Write-Hide-Show

Before playing the video, ask the children to reflect on the previous lesson:

- What units did you use to measure the weight of the items?
- What if units were used that were not all the same? Would this be a good idea? Explain why.
- If weighing a bag of carrots or potatoes, would it be a good idea to use cubes to measure the weight? Explain why.
- The metre is the standard unit for length. What is the standard unit for weight?

Play the video and allow the children time to respond to the questions and give reasons for their answers. Digital activity: Greater or Less Than a Kilogram? MAM Routine: Three-Act Task, with Build it; Sketch it: Write it

Act 1: Notice & Wonder

Assessment

Play the video, which shows a bag of sugar Opportunit, weighing 1kg and other items of unknown weights.

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 do not confirm or reject any of the ideas.

 (Reveal the focus question.) Are these greater or less than a kilogram?

Act 2: Productive Struggle

Look at the image and, using Think-Pair-Share, ask:

- Record reasonable predictions on your MWB.
- How could we find out?
- Do you have enough information? What else do you need to know?

Once the children explain that they need to know more information about the weight of the objects being compared, click to flip the image and play the next video. Ask:

- What extra 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).

Let's strengthen

The children might benefit from the additional support of the Unit 13 Let's Strengthen PCM.

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?

Then click to flip the image and play the 'big reveal' video, which shows each item being balanced on its own against the bag of sugar. Click to play or ask:

- Is that the answer that you expected? Why or why not?
- What 'I wonder' questions did you answer?
- Do you have any new 'I wonder' questions? You could also ask:
- How can we express the weight of items that are less than a kilogram?

Let's deepen

Challenge the children to work out the weight of each item in kilograms.

Pupil's Book page 83: Kilograms



Activity A (see Pupil's Book page 83): You will need weights and/or supermarket items that weigh 1 kilogram, a half kilogram and a quarter kilogram, with the weights clearly labelled. Ask the children to find other items around the room that they think are about these weights. The children then weigh their chosen items against the labelled weights to check. Initially, only allow them to hand-weigh. When appropriate, the balances can be used to check. Tell the children to use the table to record their results.

Teaching tip

Items weighing a half kilogram or a quarter kilogram will most likely have their weight given in grams. It is not necessary to explore this yet, but if the children notice it, acknowledge that 500 g is another name for a half kilogram, and 250 g is another name for a quarter kilogram.

Activity B (see Pupil's Book page 83): You will need multiple identical maths books. Holding up one of these, ask:

- Estimate. Is this heavier or lighter than a half/ quarter kilogram?
- How can you prove it?
- How many books are about the same weight as a half/quarter kilogram? Estimate.

Use Write-Hide-Show to collect estimates. Record the most frequently occurring answers or range of answers on the board. Then, working in small groups or pairs, allow the children to investigate the actual number.

Repeat, using maths copies and other books, or other available resources. Tell the children to use the table to record their results. Afterwards, ask:

- What did you notice?
- Were the answers different each time? Explain why.
- What did you notice about the answers for a half kilogram and a quarter kilogram?
- If you used heavier books, would it take more or less of them to reach the target weight (i.e. a half/quarter kilogram)?

Let's deepen

Challenge the children to explain why the answers are less when heavier objects are used. Challenge the children to identify the relationship between the number of items equal to a half kilogram and a quarter kilogram.

Optional consolidation and extension possibilities

Let's Create How might we create our own halfkilogram and quarter-kilogram weights without using a weighing scales? If we have a bag of rice that we know weighs 1 kilogram, could we make two halfkilogram weights from that? How? (If necessary, prompt the children to consider how a bucket or pan balance could be used to measure out a half kilogram. How could we then create a quarterkilogram weight?)

Classroom Display Add examples of 1 kilogram, a half kilogram and a quarter kilogram to the classroom display, and label as appropriate.

Maths Journal The children use images and/or words to record how they conducted the investigation and their findings.

Games Bank Play the variation game 'Weight Estimate!' from the Unit 10 game 'Estimate!' Play as per 'Estimate!' except that the players estimate the number of units (e.g. cubes) that are equal to an item's weight.

Review and Reflect Use the Prompt Questions Poster.

Day 4, Lesson 3

Measuring Capacity

Focus of learning (with Elements)				
 Devises strategies to measure the attributes of a wide range of objects (A&PS) 				
Learning experiences	Equipment			
 Digital activity: The Supermarket (2) MAM Routines: Notice & Wonder, with Think-Pair-Share; Reason & Respond Digital activity: Which Has the Greater Capacity? MAM Routine: Would This Work? Concrete activity: Which Has the Greater Capacity? Pupil's Book page 84: Measuring Capacity 	 Water tray/tough tray (these can be used to prevent spillage) Various types of containers, of different sizes and capacities, including containers of different shapes but the same capacity (e.g. plastic cups, bottles, bowls, jugs, small measuring cups) Multiple cups of uniform size and shape Scoops Funnels 			

Maths language

• more than, less than, most, least, full, empty, half full, quarter full, greater/greatest capacity, less/least capacity, units, cups

Warm-up

Digital activity: The Supermarket (2) MAM Routines: Notice & Wonder, with Think-Pair-Share; Reason & Respond

Display the image, which shows two glasses and two jugs of juice (of various amounts). 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. Afterwards, ask (if not answered already):

- In what ways are the jugs the same and different?
- In what ways are the glasses the same and different?
- What do you wonder about the glasses?
- How might you investigate this?

Main event

Digital activity: Which Has the Greater Capacity? *MAM* Routine: Would This Work?, with Build it; Sketch it; Write it

Display the activity. Begin by asking the children to use Build it; Sketch it; Write it to model and solve the question: which glass has the greater capacity (i.e. which holds the most when full)? Allow time for the children to share how they did it. Ask:

Is there more than one way to do this?

Then, click to see the approaches of the programme characters. Allow the children time to comment on each, and justify if the methods/opinions work. Allow the children time to comment on each method/ opinion: do they work?

Concrete activity: Which Has the Greater Capacity?

With the children working in pairs or small groups, provide a selection of various containers, bottles, etc. from which each pair/group selects two. Ask:



- Which of your containers has the greater capacity, do you think? Label them A and B, and record your prediction.
- How might you find out?
- What might you need?
- How will you know which container has the greater capacity?
- If using cups or scoops to measure, what should be kept the same in order to get accurate findings? (Cups of the same size, filled to the same level)

Prompt the children to identify which of the strategies, as outlined in the digital activity above, would be most appropriate. Can they suggest an alternative strategy?

Allow the children time to investigate. Give each group an opportunity to report back. Prompt the children to explain the capacity relationship between the two containers, for example: 'This bottle has a greater capacity/holds less.' Ask:

- What did you find out?
- How did you do it?
- Which way was better, do you think?
- How else could you check your answer?

Teaching tip

The children use images and/or words to record how they conducted the investigation and their findings.

Let's strengthen

The children may benefit from a carefully selected range of containers, which includes containers of different shapes but the same capacity.

Let's deepen

Challenge the children to compare three or more containers/bottles, and to predict their findings, if ordered from greatest to least capacity. Once they have recorded a prediction, they investigate it to check. Challenge them also to record this relationship using inequalities: 'A > B > C', 'A is greater than B and B is greater than C', etc.





Activity A: The children

work together in groups to estimate and measure the capacity of three containers/ bottles.

Let's strengthen

Activity B: The children may need to use conrete resources to model the scenario on page 84 of the Pupil's Book (see the Unit 13 Let's Strengthen Suggestions for Teachers for more about proportional reasoning).

Optional consolidation and extension possibilities

Games Bank Play the variation game 'Capacity Estimate!' from the Unit 10 game 'Estimate!' Play as per 'Estimate!' except that the players estimate the number of units (e.g. cups or scoops) that are equal to the item's capacity.

Story Read *More for Me!* by Sydnie Meltzer Kleinhenz.

Play Area Set up a station(s) where the children can choose to explore capacity further over the course of the unit, e.g. water play, sand play, or a station where the children can fill containers with rice or cereal hoops.

Capacity Display Set up a Capacity Display. Include containers, bottles and appropriate labels (e.g. the Unit 13 Maths Language Cards). The children contribute examples of their own work from this lesson and label them.

Home/School Links Book page 30 can be completed at any stage after this lesson.

Review and Reflect Use the Prompt Questions Poster.

Days 5 and 6, Lesson 4

Litres

Focus of learning (with Elements)

- Identifies the litre (l) as a standard unit for capacity (U&C)
- Discusses and records estimations and measurements using litres and symbols (e.g. l) (C)

Learning experiences

- Digital activity: Same But Different Capacity MAM Routines: Reason & Respond, with Think-Pair-Share
- Digital activity: How Many Glasses of Milk? MAM Routines: Three-Act Task, with Build it; Sketch it; Write it
- Digital activity: What Is Its Capacity? (A) MAM Routines: Concept Cartoon, with Think-Pair-Share
 - Digital activity: What Is Its Capacity? (B) MAM Routine: Would This Work?
- 🕑 Pupil's Book page 85: Litres

Equipment

- Water tray/tough tray (these can be used to prevent spillage)
- Various types of containers, of different sizes and capacities, including containers of different shapes but the same capacity (e.g. plastic cups, bottles, bowls, jugs, small measuring cups)
- Multiple cups of uniform size and shape
- Containers that have a capacity of 1 litre, a half litre and a quarter litre
- Scoops
- Funnels

Maths language

litres (l)

Warm-up

Digital activity: Same But Different – Capacity MAM Routines: Reason & Respond, with Think-Pair-Share Display the slideshow. Using Think-Pair-Share, ask the children to propose reasons for why the images are the same and why they are different.

Main event

Digital activity: How Many Glasses of Milk? MAM Routines: Three-Act Task, with Build it; Sketch it: Write it

Act 1: Notice & Wonder



carton of milk and eight empty glasses. Using Think-Pair-Share, click to play or ask:

Play the video, which shows a large

- 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 do not confirm or reject any of the ideas.

• (Reveal the focus question:) How many glasses can be filled from the carton?

Act 2: Productive Struggle

Look at the image and click to play or ask:

- Record reasonable predictions on your MWB.
- How could we find out?

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

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

Once children explain that they need to know how much the carton of mlik holds OR how much each glass holds, click to reveal the second image, which shows that the carton holds 2 litres of milk and the glass holds $\frac{1}{4}$ litre (250 ml) of milk. 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?

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? (How many glasses can be filled from the carton? How do you know?)
- What strategies did you use to get the answer?

• What do you think was the most efficient strategy? Click to flip the image and play the 'big reveal' video, which shows that eight glasses can be filled from the carton of milk. Then click to play or ask:

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

• Do you have any new 'I wonder' questions? You could also ask:

- I wonder how many quarter-litre glasses of milk there would be in two of those cartons?
- I wonder how many quarter-litre cups of milk there would be in a 1-litre carton?
- Digital activity: What Is Its Capacity? (A) MAM Routines: Concept Cartoon, with Think-Pair-Share

Display the Concept Cartoon, in which the characters are guessing the capacity of the bottle. Click each character to hear their thoughts. Then, using Think-Pair-Share to gather feedback, ask:

- What do you think?
- Record your estimate on your MWBs.
- (Point to a specific character.) Do you agree with their idea? Explain why.
- What do you think is the capacity of bottle A? Why do you think this?

If appropriate, record the children's responses to these 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.

Digital activity: What Is Its Capacity? (B) MAM Routine: Would This Work?, with Build it; Sketch it; Write it

Have a selection of various containers available (see equipment list). Display the activity. Begin by asking the children to consider the question: how could we find out the capacity of the first bottle (bottle A)? Ask:

- What equipment would be useful?
- Is there more than one way to do this?

Allow time for the children to share their ideas for how this could be done. Then play on to reveal the strategies being suggested by the characters, and ask:

- What do you think of their strategies?
- Do you think that they work?
- How are they similar/different to your strategies?

Following on from this, ask the children to use these or other strategies to identify from the various containers, those that have a capacity of 1 litre, a half litre and a quarter litre. Afterwards, ask:

- Were you correct?
- How do you know?

After identifying a number of containers that also hold the same amount, ask:

- How are these the same?
- How are they different?
- Were you surprised by any of them?

Teaching tip

The children may highlight that their own drinks have a capacity marked in ml. While it is not necessary to explore this in depth yet, if it arises, acknowledge that 500 ml is another name for a half litre, and 250 ml is another name for a quarter litre.

Let's strengthen

The children may benefit from using 250 ml cups and 500 ml cups when exploring the capacity of unknown containers.





Optional consolidation and extension possibilities

Games Bank Play 'Overflow', first using a 1 litre container, then a half-litre container, and then a quarter-litre container.

Home/School Links Book page 31 can be completed at any stage after this lesson.

Classroom Display Add examples of 1 litre, a half litre and a quarter litre to the classroom display, and label them.

Equipment

Any available resources for modeling, such as cubes,

number lines, 100 squares,

base ten blocks and place

value grids

Review and Reflect Use the Prompt Questions Poster.

Day 7, Lesson 5

Comparing and Ordering Measures

Focus of learning (with Elements)

- Make comparative statements or judgements (C)
- Compares the measurements of objects, using the same standard unit (U&C)

Learning experiences

- Digital activity: Same But Different Measuring Capacity MAM Routines: Reason & Respond, with Think-Pair-Share
- Digital activity: Ordering From Shortest to Longest MAM Routines: Reason & Respond, with Build it; Sketch it; Write it
 - Pupil's Book page 86: Comparing and Ordering Measures

Maths language

shortest, longest, tallest, bar model

Teaching tip

This lesson and the remaining lessons in this unit draw on knowledge and understanding that have been developed in this and the following units: Unit 1: Numbers to 100, Unit 2: Addition and Subtraction 1, Unit 7: Numbers to 200, Unit 8: Addition and Subtraction 2, and Unit 10: Measuring 1.

Warm-up

Digital activity: Same But Different – Measuring Capacity MAM Routines: Reason & Respond, with Think-Pair-Share Display the slideshow. Using Think-Pair-Share, ask the children to propose reasons for which option they would prefer.

Main event

Digital activity: Ordering From Shortest to Longest MAM Routines: Reason & Respond, with Build it; Sketch it; Write it

Display the image, which shows an image of of supermarket aisles of different lengths. Begin by asking the children to use Build it; Sketch it; Write it to model and solve the

question: order from shortest to longest. Ask:

- What must be done first?
- What strategy could be used?
- Is there more than one way to do this?

If not suggested, prompt further:

- Could we use cubes to represent the length of the aisles? How might we do this?
- Could we use an open number line to represent the length of the aisles? How might we do this?
- Could we use base ten blocks to represent the numbers? How might we do this?
- Could we draw bar models to represent the length of the aisles? How might we do this?

Allow time for the children to share how they did it. Then click to see the approaches of the programme characters. Ask:

- Do their strategies work?
- How do their strategies compare to your strategies?
- Pupil's Book page 86: Comparing and Ordering Measures



Encourage the children to use concrete or pictorial models (the latter can be recorded in their Maths Journals) to work out their answers. Afterwards, allow time to discuss the various strategies and models used.

Optional consolidation and extension possibilities

Story Read *Polly's Pen Pal* by Stuart J. Murphy. **Games Bank** Play 'Win Big!' and/or 'Less is Best!' **Review and Reflect** Use the Prompt Questions Poster.

Day 8, Lesson 6

Operations with Measures

Focus of learning (with Elements)

Solves single and multi-step problems involving addition and subtraction of measures (using real-life contexts where appropriate) (A&PS)

Learning experiences

- Digital activity: Which One Doesn't Belong? MAM Routines: Reason & Respond, with Think-Pair-Share
- D Digital activity: Bin Bags *MAM* Routine: Reason & Respond, with Build it; Sketch it; Write it
 - Pupil's Book page 87: Operations with Measures

Equipment

 Any available resources for modeling, such as cubes, number lines, 100 squares, base ten blocks and place value grids

Maths language add, total, subtract, take away, difference, count on, bar model Warm-up Digital activity: Which One Doesn't Belong? Display the image and, using Think-Pair-Share, ask MAM Routines: Reason & Respond, with Thinkthe children to propose reasons for why each jug **Pair-Share** doesn't belona. Main event Digital activity: Bin Bags MAM Routine: Reason Pupil's Book page 87: & Respond, with Build it; Sketch it; Write it **Operations with** Measures a.a. Display the image, which shows two bin bags (one 50l bag and one 20l bag). Ask the children to use Build it; Sketch it; Write it to model and solve the question: What is the total capacity of these bags? Allow time for the children to share their approaches. If not suggested, ask: Could you use the place value counters and the Allow the children to complete the page in pairs or place value grid? How? small groups. Prompt them to use concrete or • Could you use the open number line on your pictorial models (the latter can be recorded in their MWB? How? Maths Journals) to work out their answers. • Could you draw a bar model? Afterwards, allow time to discuss the various Could you use the column method? strategies and models used. How might you work this out if the question was, 'How many more litres does the black bag hold than the white bag?' **Optional consolidation and extension possibilities**

Story Read *Polly's Pen Pal* by Stuart J. Murphy (if not read previously).

Games Bank Play the variations 'Length Estimate!', 'Weight Estimate!' and 'Capacity Estimate!' from the Unit 10 game 'Estimate!' **Review and Reflect** Use the Prompt Questions Poster.

Day 9, Lesson 7 Classroom Olympics

Focus of learning (with Elements)

- Evaluates the reasonableness of measurements with reference to estimations and personal benchmarks (R)
- Uses base units and appropriate instruments to solve rich practical tasks and problems involving measurement (A&PS)

Learning experiences

Digital activity: Which Would You Rather? – Measures MAM Routines: Reason & Respond, with Think-Pair-Share

DP Digital activity: Classroom Javelin Throw MAM Routines: Concept Cartoon, with Think-Pair-Share

Equipment

- Paper straws
- Equipment for chosen activities
- PCM 38

- PCM 39
 - PCM 40

Maths language

• further, distance, height

Teaching tip

STEM: This lesson enables the children to work scientifically as they apply their knowledge and skills to one or more measuring investigations. The Concept Cartoon (below) introduces one possible problem that could be investigated. However, you and/or the children may choose an investigation from the many other possibilities available on PCM 38: Measuring Investigations.

Warm-up

Digital activity: Which Would You Rather? – Measures *MAM* Routines: Reason & Respond, with Think-Pair-Share

Play the slideshow and, using Think-Pair-Share, ask the children to propose reasons for why they would rather have one of the graphics over the other.

Main event

Digital activity: Classroom Javelin Throw MAM Routines: Concept Cartoon, with Think-Pair-Share

Distribute a copy of PCM 39: Investigations Planning Sheet to each child. (You might also wish to use PCM 38: Measuring Investigations along with the Investigation Planning Sheet.) The children will also need a paper straw, a pencil, a ruler and a crayon each. Display the Concept Cartoon, in which the characters are guessing which object will go further. Click each character to hear their thoughts. Using Think-Pair-Share to collect feedback, ask:

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

If appropriate, record the children's responses to these 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:

- How could we find out?
- What should we do?

- What equipment is needed?
- How do we make sure our investigation is fair? What needs to be kept the same each time? What will be different?
- How do we make sure our results are reliable and/ or accurate? What will we measure? How will we do this?

Allow the groups time to discuss and/or start to fill in PCM 39, before carrying out the investigation. Afterwards, give each group an opportunity to report back. Ask:

- What did you find out?
- How did you find this out?
- How did you record/present what you did?
- What was difficult? What was easy?
- Did the results surprise you? Explain why.

Next, depending on the time available, distribute a copy of PCM 40: Classroom Olympics to each child. (See the PCM for details of equipment needed.) The children organise and participate in activities* detailed on the PCM. They discuss and agree on the rules for each activity themselves.

*For left-handed sponge squeeze, lift a large sponge out of a container of water, and using only the left

hand, squeeze water into an empty container. Measure or compare amounts of water.

Teaching tip

It is important that the children use their own suggested strategies while investigating, even if

there are other more obvious and/or efficient approaches. Through investigating, they may realise that another approach was preferable. Prompt them to refine their methods, and then to repeat.

Optional consolidation and extension possibilities

Story Read *Polly's Pen Pal* by Stuart J. Murphy (if not read previously).

Let's Investigate See PCM 38: Measuring Investigations (1 of 2) and (2 of 2) for other suggestions.

Games Bank Play the variations 'Length Estimate!', 'Weight Estimate!' and 'Capacity Estimate!' from the Unit 10 game 'Estimate!' **Maths Journals** The children use images and/or words to record how they conducted the investigation and their findings.

Review and Reflect Use the Prompt Questions Poster.

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

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 investigate!	
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).	Refer to PCM 38 Measuring Investigations (1 of 2) and (2 of 2). Allow groups of children to choose and conduct an investigation. Alternatively, use this as an opportunity to complete some of the events on PCM 40: Classroom Olympics.	
Maths language	Maths strategies and models	
Ask the children to explain the following terms (perhaps using examples or drawings on their MWBs): kilogram, litre, weigh, heavy, light, heavier than, lighter than, heaviest, compare, estimate, capacity, greater than (>), less than (<), is equal to/ equals (=) Use the Unit 13 Maths Language Cards to revise the key terms. For example: If the image and text are cut apart, can the children match them?	Ask the children to give examples of the strategies they used in this unit, e.g. how to hand weigh, how to use the various balances, how to measure capacity using visual comparisons, how to use cups, and the importance of using uniform units. Ask the children to give examples of the models they used in this unit. For example: How did they record their findings for the various problem tasks and investigations? Did they use tables? Did they draw	
Complete the top part of the My Maths Fact File on page 125 of the Pupil's Book.	multiple glasses? Did they count? Did they use counting aids?	
Progress Assessment Booklet	Maths eyes	
Complete Questions 48–51 on pages 23–24. Alternatively, these can be left to do as part of a bigger review during the next review week.	If appropriate, take a trip to a local supermarket, looking for examples of weight and capacity. How are they similar to/different from those looked at during this unit? Take photos to display or compile in a digital slideshow for the classroom.	
Let's strengthen	Let's deepen	
Identify children who might benefit from extra practice with some of the key concepts or skills in this unit. Consult the Unit 13 Let's Strengthen Suggestions for Teachers and/or use the Unit 13 Let's Strengthen PCM.	Use the Unit 13 Let's Deepen PCM.	


