Maths and Me: 2nd Class – Short-Term Plan, Unit 10: Measuring 1 (February: Week 1)

Strand(s) > Strand Unit(s)	Measures > Measuring.
Learning Outcome(s)	Through appropriately playful and engaging learning experiences children should be able to compare, approximate and measure length, weight, capacity and area using appropriate instruments and record using appropriate units of measurement

Lesson	Focus of Learning (with Elements)	CM	Learning Experiences	Assessment
1	**Measuring Length:** Devises strategies to measure the attributes of a wide range of objects (A&PS); Discusses and records estimations and measurements (C)		(D) Notice & Wonder L1, 2, 3 (D) Think-Pair-Share L1, 2, 3 (D) (P) Three-Act Task L1 (D) (C) Reason & Respond L2, 3 (D) Write-Hide-Show L2, 3 (D) Concept Cartoon L3 (D) Would This Work? L3 (D) Build it; Sketch it; Write it L3 **Print resources** Pupil's Book pages 68–70 Home/School Links Book page 25 PCM 35	**Intuitive Assessment:** responding to emerging misconceptions **Planned Interactions:** responding to insights gleaned from children's responses to learning experiences **Assessment Events:** information gathered from completion of the unit assessment in the Progress Assessment Booklet page 20
2	**Metres:** Identifies the metre (m) as a standard unit for length (U&C); Discusses and records estimations and measurements, using metres and symbols (e.g. m) (C)			
3	**Centimetres:** Identifies the centimetre (cm) as a standard unit for length (U&C); Discusses and records estimations and measurements, using centimetres and symbols (e.g. cm) (C); Compares the measurements of objects using cm (U&C)			
4	**Review and Reflect:** Reviews and reflects on learning (U&C)			

Key: Elements: U&C) Understanding and Connecting; (C) Communicating; (R) Reasoning; (A&PS) Applying and Problem-Solving. **CM: Cuntas Míosúil:** please tick when you have completed the focus of learning. **Learning Experiences:** (C) concrete activity; (D) digital activity; (P) activity based on printed materials, followed by lesson numbers.

Additional information for planning

Progression Continua	See '2nd Class *Maths and Me* Progression Continua Overview' for a detailed breakdown of how all progression continua are covered.
Maths Language	See '2nd Class *Maths and Me* Language Overview', individual lesson plans and Unit 10 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 10 Let's Strengthen Suggestions for Teachers PCM. (These address the Common Misconceptions and Difficulties listed below.) • See Unit 10 Let's Strengthen PCM. • See Unit 10 Let's Deepen PCM.
Integration	See individual lesson plans.

Background and rationale

- This unit focuses primarily on attributes of length, including width and height. Therefore, it only addresses some of the learning experiences in the progression continua. By Measuring 3, all of the learning experiences in the progression continua pertaining to measuring will have been addressed, at least once.
- In all estimation activities, the children should estimate one object at a time, and then measure that object, before estimating and measuring the next object (i.e. they should 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 have learned from the previous object.
- While the *Primary Mathematics Curriculum* (2023) does not specify which standard units should be introduced and when, *Maths and Me* incorporates the progression that has traditionally occurred in Irish classrooms. Therefore, in 1st Class, the children were formally introduced to the metre. Now, in 2nd Class, they are introduced to the centimetre.

The theme of this unit is **The School Garden**.

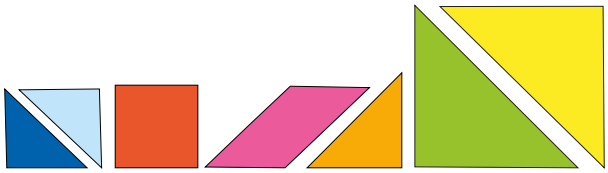
Common misconceptions and difficulties

- The children may not realise that it is most efficient to use short units for measuring small things, and long units for measuring big things.
- The children may fail to align the end points when directly comparing the length of two objects or when laying a measuring tool alongside an object to measure it.
- They may fail to appreciate the need for accuracy, and that when measuring using multiple non-standard units, the objects used must be identical and not have overlaps or gaps between them.
- They may confuse metres and centimetres.
- They may inaccurately use and/or interpret standard measuring tools (e.g. align the object at 1 because counting starts at 1 – or, if using a ruler with a blank section before 0 and after the last number on the opposite end, align the object to be measured with the end of the ruler, and not with 0). Some children may benefit from using simpler rulers with only cm markings and fewer interval lines. If these are not available, use PCM 36: 25 cm Rulers in Black and White.
- The children may fail to compensate in situations where it is not possible to align the object to be measured at 0 (see Lesson 3, for example).

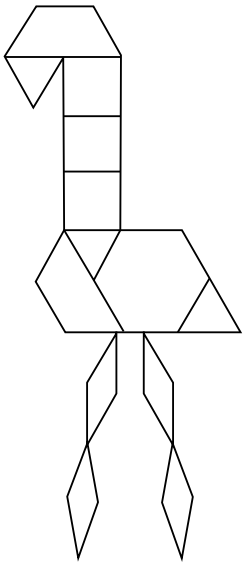
The Unit 10 Let's Strengthen Suggestions for Teachers address the common misconceptions and difficulties listed above.

Mathematical models and representations

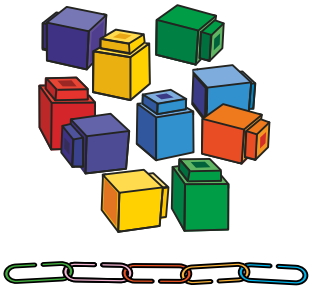
- Representations of classroom-based resources which could be used to measure, such as sticks, interlocking cubes and links, ten rods and number rods
- Metre and centimetre rulers
- Number lines
- Metre-long measuring tapes and other items that are exactly 1 metre in length
- Tangrams
- Pattern blocks



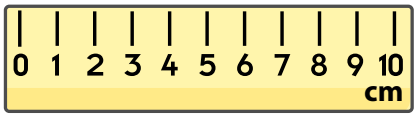
Tangram pieces



Pattern blocks



Interlocking cubes and links



Centimetre ruler

Teaching tip

The following manipulative printables are available to support this unit: Number Line 0–100, Open Number Line, Tangrams, Base Ten Blocks and Number Rods. Click on the resources icon on the *Maths and Me* book cover on **edcolearning.ie**

Day 1, Lesson 1

Measuring Length

Focus of learning (with Elements)

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

Learning experiences

- (D) Digital activity: The School Garden (1)
  MAM Routines: Notice & Wonder, with Think-Pair-Share
- (D) (P) Digital activity: Gardening Tool *MAM* Routine: Three-Act Task
- (P) Pupil's Book page 68: Measuring Length

Equipment

- Children's lunch boxes
- Classroom items that can be measured, e.g. interlocking cubes/links
- PCM 35

Maths language

- estimate, measure, length, height, width, long, longer, longest, short, shorter, shortest, tall, taller, tallest, wide, wider, widest

Warm-up

(D) Digital activity: The School Garden (1)
***MAM* Routines: Notice & Wonder, with Think-Pair-Share**

Display the image and, using Think-Pair-Share, ask:

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

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

Main event

(D) (P) Digital activity: Gardening Tool
MAM Routine: Three-Act Task

Act 1: Notice & Wonder

Distribute a copy of PCM 35: Garden Tool to each group/pair. Play the video.

Assessment Opportunity

Using Think-Pair-Share, 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.)
- (Reveal the focus question.) How long is the gardening tool in cubes?

Act 2: Productive Struggle

Look at the image and click to play or ask:

- Write an estimate that is too high on your MWB.
- Write an estimate that is too low.
- Now 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 the length of the cubes being used to measure the tool, click to reveal the second image, which shows a length of cubes (7), which appears to be about half the overall length of the garden tool. 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) on the 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, flip to reveal the final image, which shows that the length of the garden tool in cubes is 14. 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:

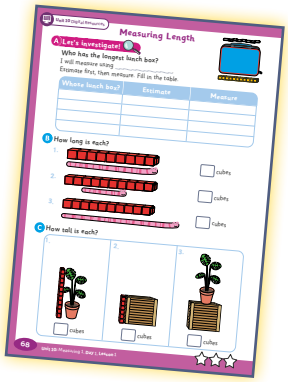
- In what other ways could the garden tool have been measured?
- Would it be a good idea to use a long gardening cane? Explain why.
- Could parts of the body have been used? Would this be a good idea? Explain why.

Teaching tip

It is very important that the children begin to develop the following ideas:

- Short units should be used for measuring small things, and long units for measuring big things.
- The length of personal benchmarks, such as strides or hand spans, differs from person to person.

P **Pupil's Book page 68: Measuring Length**



Activity A: This is done in groups of three or four, using the children's lunch boxes. Distribute cubes, links and other items that can be used as non-standard units of measurement.

Let's strengthen

Some children may need to review the procedures for measuring accurately. If useful, demonstrate an incorrect way to measure, to see if the children can spot the error. See the Unit 10 Let's Strengthen Suggestions for Teachers.

Let's deepen

Challenge the children to suggest how best to record the length of items that are not equal to whole-number answers. Ask:

- What if the measure is four and a bit? What can we do about the bit?
- Prompt the children to ascertain how much of the unit is being considered. Is it a big bit? A small bit? Almost a full piece? About a half? About a quarter? How could this be justified?

Optional consolidation and extension possibilities

Integration Language: Gaeilge – na téamaí An Scoil, An Aimsir, An t-Earrach; STEM: plant and animal life, growth and diversity; Geography: sustainability and environmental awareness and care; local habitats.

Understanding of measuring, and especially length, can also be reinforced in other subjects, such as PE: Athletics, lengths of races (60 m, 80 m, 100 m, 200 m are common race length for this age group), measuring distances thrown, and so on.

Maths Journals Using images and/or words, the children record how they conducted the investigation in the main part of this lesson, as well as their findings.

Games Bank Play 'Estimate!'

Growing Seeds Even if you do not have a school garden, many seeds can be grown well in the classroom. For meaningful application of their measuring skills, the children can track the progress of their seeds, and measure how tall the plant grows every week or number of days. Beans are one of the easiest seeds to grow in the classroom. Sunflower seeds would also be ideal for the opportunity to measure how tall the plant grows.

Display Set up a display for Length and/or Measuring in the classroom. This could include examples of measuring tools and objects (e.g. ribbons, lengths of string) as well as the appropriate labels (see Maths Language Cards). The children source real objects

from home (e.g. measuring tapes) to add to the display. The children also contribute samples of their own work from this lesson and label them.

Story Read *Six Feet Long and Three Feet Wide* by Jeannie Billington, *How Big Is a Foot?* by Rolf Myller, and/or *How Tall Was Milton?* by Lawrence F. Lowery.

Let's Strengthen PCM Use Task A to consolidate this lesson.

Let's Deepen PCM Task A can be done any time after this lesson.

Review and Reflect Use the Prompt Questions Poster.

Day 2, Lesson 2

Metres

Focus of learning (with Elements)

- Identifies the metre (m) as a standard unit for length (U&C)
- Discusses and records estimations and measurements, using metres and symbols (e.g. m) (C)

Learning experiences

- (D) Digital activity: Same But Different – Metres
  ***MAM* Routines: Reason & Respond, with Think-Pair-Share**
- (D) Digital activity: The School Garden (2) ***MAM* Routines: Notice & Wonder, with Think-Pair-Share; Reason & Respond**
- (D) Video: Metres
  ***MAM* Routines: Reason & Respond, with Write-Hide-Show**
- (P) Pupil's Book page 69: Metres

Equipment

- Metre rulers, metre-long measuring tapes, other items that are exactly 1 metre in length
- Scissors
- A4 sheets of paper
- Sticky tape

Maths language

- metre (m), rulers, measuring tape, about, less than (<), greater than (>), half ($\frac{1}{2}$), quarter ($\frac{1}{4}$)

Teaching tip

In advance, ensure that there are sufficient metre-long measuring tools available for use. The most useful resources are any that are exactly 1 metre in length and that can be laid flat, end to end, for example:

- Metre rulers and metre tapes from educational suppliers, where the total length is exactly 1 metre (i.e. no space at either end, before 0 or after 100)
- Found or made strips of paper, cardboard, plastic or wood that are exactly 1 metre in length.

See also the Unit 10 Let's Strengthen Suggestions for Teachers.

Warm-up

(D) **Digital activity: Same But Different – Metres**
***MAM* Routines: Reason & Respond, with Think-Pair-Share**

For each slide, ask the children what is the same and what is different. Using Think-Pair-Share, ask the children to propose reasons for why the images are the same or why they are different.

Main event

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

Display the poster. Using Think-Pair-Share, ask:

Assessment Opportunity

- 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. Then click to play or ask the questions below. Whenever appropriate, ask the children to give reasons for their response, e.g. to explain why or how they think this. (Some of these questions may already have been answered the previous day.)

- What are the children doing? How do you know?
- What are they measuring?
- How are they measuring?
- How are the measuring methods the same?
- How are the measuring methods different?
- Are some measuring methods more suitable for measuring bigger objects? Which ones?
- What is the best unit of measurement for measuring bigger objects? Explain why.
- What is a metre?
- About how long is a metre?
- When and where might a metre be used?

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

Play the video and allow the children time to answer the questions and to give reasons for their responses. Then, showing a metre ruler or measuring tape for reference, ask:

- What item in this room is close to a metre long? How might we check?
- (Point to the metre.) Show me the length of a half metre.
- What item in this room is close to a half metre long? How might we check?
- (Point to the metre.) Show me the length of a quarter metre.
- What item in this room is close to a quarter metre long? How might we check?

Teaching tip

It is important that the children identify familiar objects and personal benchmarks that measure about 1 metre so that they might internalise a sense of the size of 1 metre (e.g. width of arm span or large step, or any piece of classroom furniture of which a dimension equals 1 metre; a flashcard explaining this could be displayed on this item to serve as an ongoing reminder).

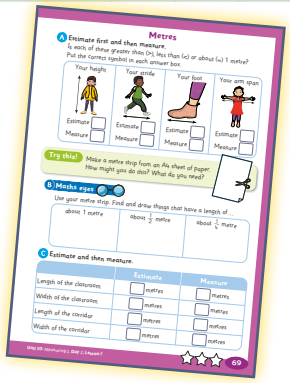
Let's strengthen

The children may benefit from reviewing halves and quarters.

Let's deepen

Challenge the children to explain why standard units of measurement, such as the metre, are used rather than strides, canes or other objects.

P **Pupil's Book page 69: Metres**



Try this! Making a metre strip will not only be a very worthwhile activity, but it will also help the children to complete the rest of the activities on the page. In particular, the ability to fold the paper will make it easier for the children to identify objects that are about a half metre long and a quarter metre long.

Let's deepen

Challenge the children to suggest how they might measure length in metres, using only two rulers/tapes, and how they might measure length in metres, using only one ruler/tape.

Optional consolidation and extension possibilities

Display The children contribute samples of their own work from this lesson and label them.

Measuring Beyond the Classroom Depending on the facilities in the school, the children measure other features, such as the basketball court, the hall, etc.

Review and Reflect Use the Prompt Questions Poster.

Days 3 and 4, Lesson 3

Centimetres

Focus of learning (with Elements)

- Identifies the centimetre (cm) as a standard unit for length (U&C)
- Discusses and records estimations and measurements, using centimetres and symbols (e.g. cm) (C)
- Compares the measurements of objects using cm (U&C)

Learning experiences

- (D) Digital activities: Same But Different – Centimetres
  ***MAM* Routines: Reason & Respond, with Think-Pair-Share**
- (D) Video: Centimetres
  ***MAM* Routines: Reason & Respond, with Write-Hide-Show**
- (D) Digital activity: The School Garden (3) ***MAM* Routines: Notice & Wonder, with Think-Pair-Share; Reason & Respond**
- (C) Concrete activity: Let's Investigate – Using Rulers
  ***MAM* Routines: Reason & Respond, with Write-Hide-Show**
- (D) Digital activity: Ruler Measuring (A)
  ***MAM* Routines: Concept Cartoon, with Think-Pair-Share**
- (D) Digital activity: Ruler Measuring (B) ***MAM* Routines: Would This Work, with Build it; Sketch it; Write it**
- (P) Pupil's Book page 70: Centimetres

Equipment

- Metre-long measuring tapes
- Centimetre rulers
- Resources whose lengths are multiples of whole centimetres, such as interlocking cubes, links, ten rod from base ten blocks or number rods, tangram triangles, trapezium and hexagon from pattern blocks

Maths language

- centimetre (cm)

Warm-up

(D) **Digital activities: Same But Different – Centimetres *MAM* Routines: Reason & Respond, with Think-Pair-Share**

Using Think-Pair-Share, ask the children to propose reasons for why the images are the same or why they are different. Ask:

- Are these measurements reliable? Explain why.
- How might they be improved?

Teaching tip

Use slides 1–4 on the first day of Lesson 3 and 5–8 on the second day of Lesson 3.

Main event

D **Digital activity: The School Garden (3)**
***MAM* Routines: Notice & Wonder, with Think-Pair-Share; Reason & Respond**

Display the poster. 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. Then click to play or ask the questions below. Whenever appropriate, ask the children to give reasons for their response, e.g. to explain why or how they think this.(Some of these questions may already have been answered the previous day.)

- When might it not be suitable to use metres to measure?
- What might you use instead? Explain why.
- What do you think would be the best unit of measurement for measuring objects smaller or shorter than a metre? Explain why.
- What is a centimetre?
- When and where might you use a centimetre?
- About how long is a centimetre?
- In your classroom what might be about 10 centimetres long?
- Estimate. About how many centimetres long is your maths book?
- Estimate. About how many centimetres wide is your maths book?
- What could you use to measure the length of objects in centimetres?

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

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

C **Concrete activity: Let's Investigate – Using Rulers *MAM* Routines: Reason & Respond, with Write-Hide-Show**

Teaching tip

Centimetre and metre rulers and tapes can be used but, if possible, avoid using rulers where the numbers given are a measure of millimetres rather than centimetres.

Distribute centimetre rulers and resources whose lengths are multiples of whole centimetres (e.g. interlocking cubes, links, ten rod from base ten blocks or number rods, tangram triangles, trapezium and hexagon from pattern blocks) to each group. Say/ask:

- Look at the centimetre rulers. What is the same about them?
- What is different?
- What else in maths do the rulers remind you of? (number line and/or number path)
- What numbers are on each ruler?
- What do the numbers mean?
- How could you use the rulers to measure the other objects?
- Estimate the length of one cube in centimetres. (Use Write-Hide-Show to collect estimates.)
- Now measure the cube. What length is it?
- (Show a ten rod.) Do you think this is longer or shorter than the cube?
- Estimate the length of one ten rod in centimetres. (Use Write-Hide-Show to collect estimates.)
- Now measure the ten rod. What length is it?
- (Show the largest tangram triangle.) Do you think this is longer or shorter than the ten rod?
- Estimate the length of the base of the largest tangram triangle in centimetres. (Use Write-Hide-Show to collect estimates.)
- Now measure the triangle. What length is it?

Repeat with other available objects as required.

Let's strengthen

The children may benefit from using simpler rulers with only centimetre markings and fewer interval lines. If these are not available in class, you could use PCM 36: 25 cm Rulers in Black and White.

Let's deepen

Challenge the children to measure the length of the other tangram or pattern block pieces; many of these have lengths of whole/half centimetres. Ask the children to suggest how best to record these measures.

D Digital activity: Ruler Measuring (A)
***MAM* Routines: Concept Cartoon, with Think-Pair-Share**

Display the Concept Cartoon and, using Think-Pair-Share, ask:

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

If appropriate, record the children's responses to these questions on the board. Allow them 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?

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

D Digital activity: Ruler Measuring (B)
***MAM* Routines: 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: how long do you think the leaf is? Allow time for the children to share how they did it. Ask:

Assessment Opportunity

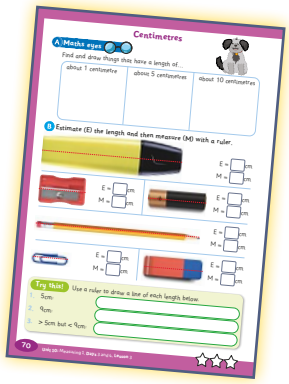
- How did you work this out?
- Why did you do it this way?
- How can we find out who is correct?

Then click to show the various models and approaches of the characters, allowing the children time to comment on each, and to justify whether the methods/opinions work.

Let's deepen

Challenge the children to calculate the answers to more 'broken ruler' questions. See the Unit 10 Let's Deepen PCM.

P Pupil's Book page 70: Centimetres



Activity A: Encourage the children to identify plenty of familiar objects that measure about 1 cm so that they might internalise a sense of the size of 1 cm (e.g. the width of a little finger, the width of a lollipop stick, the width of a paper clip).

Optional consolidation and extension possibilities

Display The children contribute samples of their own work from this lesson and label them.

Home/School Links Book Page 25 can be completed at any stage after this lesson.

Games Bank Play the variation game 'Centimetres Estimate!' from the game 'Estimate!'. Play as per 'Estimate!' except that the players estimate and measure the length in centimetres using a ruler.

Measuring Height Start a record of the children's heights by asking them to measure each other. The resulting data is added to the display and/or recorded in the children's Maths Journals. Ask the children to interpret the resulting data, e.g. *What statements can you make about the figures?* This activity can be repeated later in the year as part of Measuring 2 and Measuring 3, to highlight how the children are still growing, and for them to apply subtraction skills to find the difference, e.g. *How much have you grown? Who has grown most?*

Online Activity Use the online ruler to measure the length of the fish. Select Level 1 on the left-hand side for whole cm. See edco.ie/qyz5

Let's Strengthen Use Task B on the PCM to consolidate this lesson.

Let's Deepen Challenge the children to complete some of the tasks on the PCM.

Review and Reflect Use the Prompt Questions Poster.

Day 5, Lesson 4

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.
- Alternatively, choose any of the images from the digital resource 'Same But Different'.

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.	Play 'Cotton Ball Shot-Put'. Each player, in turn, throws a cotton ball and measures and records how far they threw it. The players take three throws each. The player with the longest throw wins the game. Play another round of 'Estimate!' from the Games Bank.
Maths language	**Maths strategies and models**
Ask the children to explain the following terms, perhaps using examples or drawings on their MWB: length, height, width, long, short, tall, wide, narrow, is longer than, is shorter than, is taller than, is wider than, is narrower than, longest, shortest, tallest, widest, metre (m), centimetre (cm), rulers, measuring tape, less than (<), greater than (>). Use the Unit 10 Maths Language Cards for this unit 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 page 125 of the Pupil's Book.	Ask the children to give examples of the strategies they used in this unit (e.g. how to measure accurately, using the same-sized units, with no gaps or overlaps; how to use and interpret a ruler; how to use the 'broken ruler', etc.).
Progress Assessment Booklet	**Maths eyes**
Complete Questions 41-42 on page 20. Alternatively, these can be left to do as part of a bigger review during the next review week.	Go for a walk through the school and/or local area and bring the metre and centimetre measuring tools. Each group makes up a question based on the school environments and then swaps questions with another group to solve.
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 10 Let's Strengthen PCM. Consult the Unit 10 Let's Strengthen Suggestions for Teachers.	Use the Unit 10 Let's Deepen PCM.

Notes