Unit 10
Measure

Mastery Expert tip! "Wherever possible, encourage children to compare and measure objects around the classroom, comparing them verbally using the terms *longer* or *shorter*, *heavier* or *lighter*, *more* or *less*. Give children the opportunity to measure in context, such as measuring ingredients for cakes."

Don't forget to watch the Working with measure video!

Early Learning Goals

There is no specific Early Learning Goal related to Measure. This unit supports the following Development Matters statement:

→ **Mathematics DM statement:**
Compare length, weight and capacity.

WHY THIS UNIT IS IMPORTANT

This unit focuses on developing children's understanding of the different elements that can be measured. Children will learn the difference between measuring weight and measuring size through investigation. They will apply their skills of counting to measure objects using non-standard units.

It is important that children are exposed to a variety of opportunities to physically measure by lining up objects with a starting point then comparing by observation and by using non-standard units. This forms the basis for formal measuring they will meet in later years.

WAYS OF WORKING

Children should be given lots of opportunities to measure and describe objects around the classroom, using the terminology of *longer* or *shorter*, *taller* or *shorter*, *heavier* or *lighter* and *more* or *less*. Use stories such as *The Three Bears* as a starting point for discussing measures: the size and weight of the bowls of porridge, the height of the chairs, the length of the beds, for example. Ask: *Is Daddy Bear's chair taller or shorter than Baby Bear's chair?*

WHERE THIS UNIT FITS

→ Unit 9: Addition to 10
→ **Unit 10: Measure**
→ Unit 11: Number bonds to 10

In this unit, children will meet, for the first time, length, height and weight. They will learn how to compare two or more items using the vocabulary of measure and will begin to use non-standard measures to measure then compare items.

Link to Key Stage 1

Measurement

- measure and begin to record the following: lengths and heights, mass/weight
- compare, describe and solve practical problems for: lengths and heights [for example, long/short, longer/shorter, tall/short, double/half] and mass/weight [for example, heavy/light, heavier than, lighter than]

The learning in this unit establishes the key vocabulary for measure used in KS1. Initially, in Year 1, children will continue to use similar non-standard measures to the ones used in this unit, which will prepare them to learn and use the standard units of measure they will meet in Year 2.

ASSESSING MASTERY

Children who have mastered this unit will be able to:

- describe the length, height and weight of objects using everyday language
- understand the difference between length, height and weight
- use non-standard units to measure and compare length, height and weight
- solve problems involving length, height and weight

COMMON MISCONCEPTIONS	STRENGTHENING UNDERSTANDING	GOING DEEPER
Children may fail to align the starting points of objects when comparing lengths.	Encourage children to use a wall, floor or book to align the starting points of objects.	Ask children to correct mistakes when objects are aligned incorrectly.
Children may not understand the importance of non-standard units being the same.	Provide children with a range of non-standard measuring units and use one object that is clearly different from the rest. For example, six multilink cubes and one wooden block. Discuss why this doesn't give an accurate measure.	Encourage children to measure an object using different non-standard units and compare how many of each are equal to the length or weight.
Children may think that larger objects always weigh more than smaller objects.	Ensure that children have opportunities to hold a variety of objects where sometimes the larger object is lighter than the smaller one.	Ask children to explore finding objects or containers of different sizes that have similar or the same weights.

STRUCTURES AND REPRESENTATIONS

Although there are no set mathematical structures and representations for this unit, balance scales and multilink cubes as non-standard measures will be helpful.

RESOURCES

Mandatory: multilink cubes, playdough, pencils of different lengths, chalk or tape, crayons, ribbons or ropes of varying lengths (including some longer lengths), balance scales, everyday objects for weighing and comparing (stones, shells, fruit, sand, playdough, classroom objects, toys), fruit (pineapple, banana, orange), tennis balls, teddies, wooden blocks, toy cars, balloons

Optional: jars or pots of varying heights, spoons of varying lengths, lengths of string, strips of paper, posters or pictures showing items in nature of different heights (trees, animals), larger items to be used as non-standard measures, ramps, toy cars, a set of three chairs of varying heights, buckets with handles, strong elastic bands, simple spring balance, different-sized boxes, different-sized balls, pre-prepared wrapped parcels of sand of various sizes, cupcake cases, soil, plant pots, footprint (photocopiable 24)

TEACHING TOOLS

balance scales, multilink cubes

KEY LANGUAGE

There is some key language that children will need to know as part of the learning in this unit:

- large/larger/largest, bigger, small/smaller
- **longer**/longest, **shorter**/shortest, tall/**taller**/tallest, further/furthest
- heavy/**heavier**/heaviest, light/**lighter**/lightest
- same, different, amount, widest, thinnest
- **length**, width, height, **weight**
- equal, the same, balanced, **balance scale**
- estimate, predict, check, measure, compare, order

Length, height and distance

Learning focus

This week, children will be introduced to length, height and distance. They use the words *longer*, *shorter* and *taller* to compare length. Children will focus on lining up objects to compare them and begin to explore non-standard units of measurement.

Small steps

- Previous step: Combining 2 groups to find the whole
- **This step: Length, height and distance**
- Next step: Weight

COMMON MISCONCEPTIONS

Children may compare items without lining them up, causing them to compare inaccurately. Support children by drawing a line or using tape or a book to give children a starting point to compare from. Ask:

- *How can you line up the items? Why is it important to line up the items?*

Children may use non-identical items or leave gaps between items when using non-standard units to measure items. Ask:

- *What items will you use to measure? Are they all the same? Why must the items you use to measure all be the same size?*

KEY LANGUAGE

In lesson: **longer**, longest, **shorter**, shortest, **taller**, tallest, **length**, opposite, measure, bigger

Other language to be used by the teacher: compare, further, furthest, height, accurately

RESOURCES

Mandatory: multilink cubes, playdough, pencils of different lengths, chalk or tape, crayons, cups, ribbons or ropes of varying lengths (including some longer lengths)

Optional: jars or pots of varying heights, spoons of varying lengths, lengths of string, strips of paper, posters or pictures showing items in nature of different heights (trees, animals), larger items to be used as non-standard measures, ramps, toy cars, a set of three chairs of varying heights, footprint (photocopiable 24)

EXPLORE

Taking every opportunity throughout the school day to build and reinforce mathematical concepts gives children's learning purpose and meaning in the wider context of their lives.

ACTIVITY	AREA	DESCRIPTION	RESOURCES
Is it long enough?	Dining area	Provide a selection of jars of different heights and spoons of different lengths. Ask: *Could you scoop out something from the bottom of this jar with this spoon? If not, why not?*	Selection of jars or pots of varying heights and spoons of varying lengths
Same length	Classroom	Ask children to search for items that are the same length or height as a tower of 2–10 multilink cubes.	Multilink cubes
Can you measure?	Classroom	Ask children to measure strips of paper of varying lengths using a piece of string. Can they determine which strip is longer or shorter than the string?	Lengths of string, strips of paper in varying lengths (some shorter, some longer than the string)

Day 1

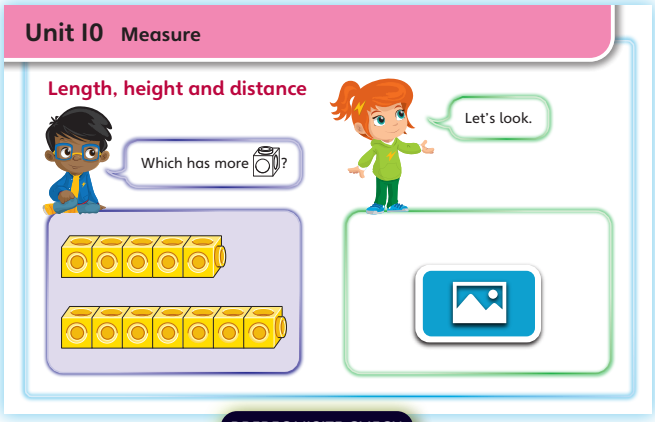
Learning focus

Introduction to length – longer and shorter

Before you teach

- What materials do you have that are readily available to measure and compare?
- Have plenty of towers of multilink cubes of different heights available.
- Use posters or pictures showing items in nature of different heights (trees, animals).

Starter



PREREQUISITE CHECK

PREREQUISITE CHECK Children compare two rows of cubes to see which has more.

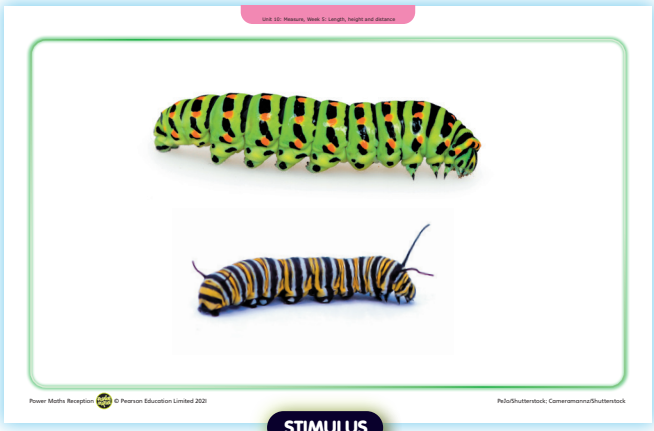
WAYS OF WORKING Whole class

Have multilink cubes available for children to replicate the picture.

IN FOCUS Children use their experience of comparing two items to discuss the two rows of cubes and count the number of cubes in each. Children may begin to use vocabulary such as *shorter* and *longer* to describe the rows of cubes.

ASK

- *Which stick has more cubes? How do you know?*
- *Are all the cubes the same size?*
- *How many cubes does each stick have?*
- *Which stick is longer?*
- *Do you think you could build a longer stick? How many cubes could you use?*



STIMULUS

STIMULUS Photograph prompting a guided activity

WAYS OF WORKING Whole class

Have playdough available for children to make model caterpillars.

IN FOCUS Discussing and comparing the two caterpillars will bring out language such as *bigger*, *smaller*, *longer* and *shorter*. Encourage a focus on the mathematical vocabulary of *longer* and *shorter*. Explain that when comparing two objects you should use the terms *longer* or *shorter* (comparatives) and when ordering and comparing three or more objects you use *longest* or *shortest* (superlatives).

ASK

- *What is the same about the caterpillars? What is different?*
- *What words can you use to describe the top caterpillar?*
- *Which caterpillar is shorter? Which caterpillar is longer? How do you know?*

GET ACTIVE Encourage children to make their own caterpillars from playdough. In small groups, ask them to see who can make the longest and the shortest. Children could experiment with putting their caterpillars in length order. Ask: *Can you make a caterpillar that is longer than the green caterpillar? Can you make one that is shorter than the black and yellow caterpillar?*

Day 2

Learning focus

Comparing lengths using *longer* and *shorter*

Discover

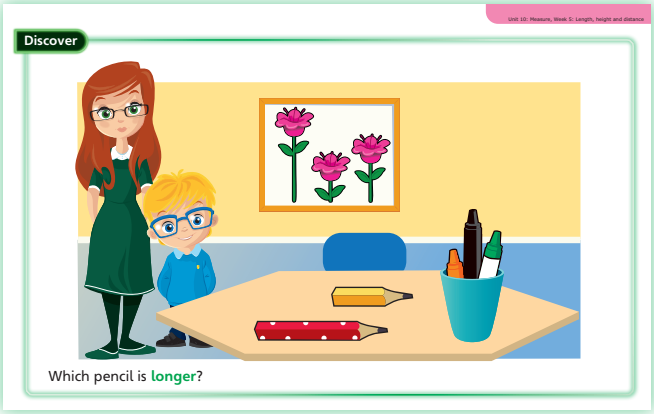
WAYS OF WORKING Whole class or small groups
Have pencils of different lengths available to recreate the **Discover** picture.

IN FOCUS The focus of **Discover** is to introduce the key vocabulary of *longer* and *shorter* and explore ways to compare items. The two items to compare are not lined up, to encourage discussion about how lining up items will help to visually compare them accurately.

ASK

- *What can you see on the table?*
- *Which pencil is longer? Which pencil is shorter?*
- *How could you check?*
- *Who is taller? Who is shorter?*
- *Look at the pot of crayons. Can you see which crayon is the longest? Can you see which crayon is the shortest?*

STRENGTHEN Show children two similar pencils of different lengths and discuss how they could compare them to see which is longer or shorter. Physically handling the items will help children to see that they can be moved around, and they may suggest lining them up.



DEEPEN Once children have compared two items, ask them to find another item in the classroom that is longer or shorter than the items and line them up in order, shortest to longest or longest to shortest. Reinforce the correct language: *longer* or *shorter* when comparing two items, and *longest* or *shortest* when comparing three or more items.

Share

WAYS OF WORKING Whole class

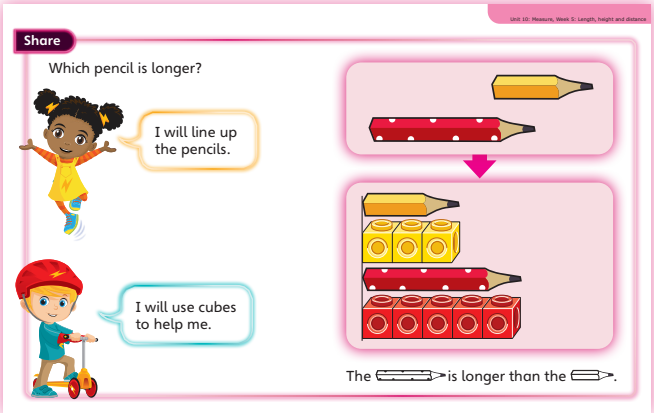
IN FOCUS The focus of **Share** is to introduce children to the importance of lining up objects from the same point to compare them accurately, and to the idea of using non-standard units to measure the length of something.

ASK

- *How could you compare the pencils to find which is longer?*
- *Draw children's attention to what Flo says. How will lining up the pencils help?*
- *Can you line up two pencils to compare them?*
- *How will cubes help Dexter to see which is longer?*

STRENGTHEN Use masking tape to make a line that children can use as a starting point or baseline. Model how to place the items so that they are all lined up to the same line, making it easy to see which items are longer or shorter. Suggest items that could be used as a baseline: a book, a ruler, a piece of tape, the edge of the table, for example.

DEEPEN Deepen understanding for children who are confident comparing two items by encouraging them to order three or more items from shortest to longest using a baseline to compare accurately. Either provide them with items to order, or encourage them to choose items from around the classroom. Ask children to suggest what items would be suitable to use as a baseline and what items would not.



GET ACTIVE Show an object from the classroom or outdoor area. Ask children to find an object that they think is shorter, taller or longer than your object. Get them to measure by lining up the items to prove it is longer or shorter. Model stem sentences that children can use when talking about the objects they have found: *The pencil is longer than the _____. The _____ is shorter than the spade.*

Day 3

Learning focus

Understanding the relationship between length and height

Think together

WAYS OF WORKING Whole class or small groups

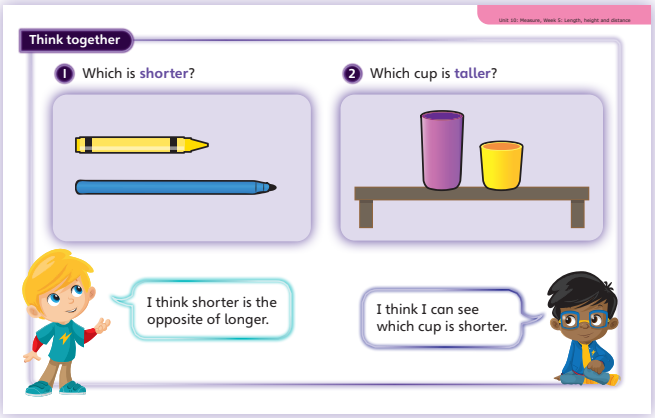
Provide multilink cubes for children to use for measuring.

IN FOCUS In **Think together**, children practise the strategies for comparing length learned in **Share**. The small step of progression in Question 1 is the introduction of the language *shorter* and looking at non-identical items, which addresses the misconception that only items that are the same can be compared by length. Use a ruler against the whiteboard to remind children of the importance of checking items are lined up before comparing. Question 2 changes the orientation of the items so children are now comparing height and introduces the word *taller*.

ASK

- Question 1: *Which item is shorter? How can you find out?*
- Question 1: *How can you check if the items are lined up?*
- Question 1: *Why do you need to line up the items?*
- Question 1: *How else could you compare the items?* [Using cubes.]
- Question 1: *Which is shorter? Which is longer?*
- Question 2: *How can you tell the cups are lined up?* [The table is the baseline.]
- Question 2: *What is different in this picture? What does taller mean?*
- Question 2: *If shorter is the opposite of longer, what is the opposite of taller?*

STRENGTHEN Give children a crayon and a pencil that are comparable in length to the ones in the picture. Ask for suggestions of how to create a baseline, then use masking tape on the table to create one. Give children two different



cups and discuss how the table ensures they are starting from the same point because the bottoms of the cups are both on the same table. Provide multilink cubes and model using these to measure the items and count which item measures more cubes. Encourage children to compare them. Model using the language *measure*, *longer*, *shorter* and *taller*.

DEEPEN Challenge children to choose objects that they can compare by length or height and use non-standard units (cubes, for example) to measure them. Show them how to line up the cubes with the end of the object they are measuring. Count how many cubes long each object is and order the objects by size.

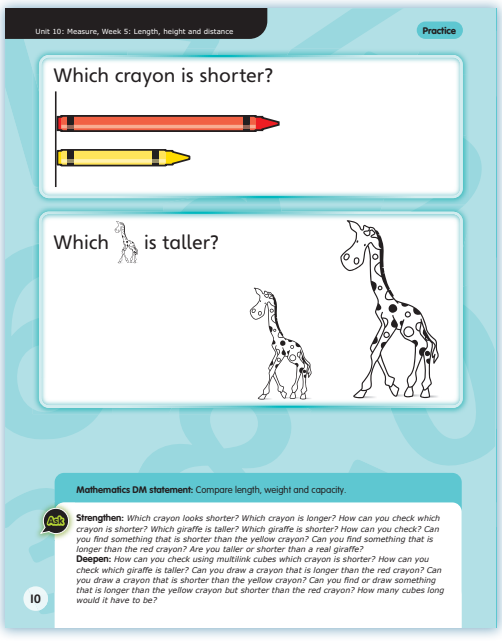
GET ACTIVE Encourage children to explore the outdoor area and look at the heights of different objects. Ask: *Which is taller: the slide or the bike? Which tree is the tallest? Which is the longest skipping rope?*

Practice: Journal 1

WAYS OF WORKING Independent thinking

IN FOCUS This **Practice** activity allows children to use the methods they have learnt to compare items by length and height and measure them using non-standard units, showing their understanding of the terms *longer*, *taller* and *shorter*.

MASTERY CHECKPOINT Children who have mastered this concept can compare two items by length or height by lining them up. They can apply the correct vocabulary of *longer* or *taller*, depending on whether they are comparing length or height, and know that shorter applies to both height and length.



Day 4

Learning focus

Understanding that objects need to be straight in order to compare them accurately; selecting an appropriate unit of measure

Challenge

WAYS OF WORKING Whole class

Ensure that there is a range of ribbons or lengths of rope for children to explore, including some of longer length that children can measure using larger non-standard measures. Support children to straighten out the ribbons and to make and use a suitable starting line to compare lengths.

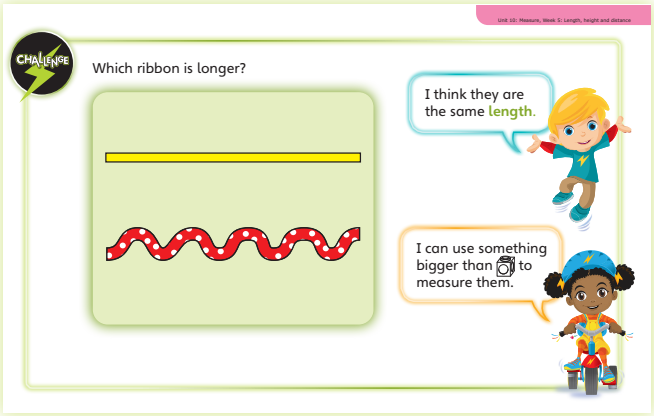
IN FOCUS The focus of **Challenge** is for children to think about the importance of objects being straight in order to compare them accurately and to introduce the idea of selecting an appropriate unit of measure.

ASK

- *Which ribbon do you think is longer? Why?*
- *Are they lined up at a starting point? Why is this important?*
- *Why does Dexter think the ribbons are the same length? Do you think he is right?*
- *Are both of the ribbons straight? If you straighten the spotty ribbon, will it be longer or shorter than the plain one?*
- Draw children's attention to what Flo is saying. *Why does Flo think she can use something bigger to measure them?*
- *How many cubes do you think you would need to measure the straight ribbon?*
- *What could you use instead of cubes?* [Items that are larger than cubes.]

STRENGTHEN Provide children with two different lengths of ribbon or rope. Make a line with masking tape or chalk to give them a baseline to compare the lengths from. Remind children to stretch out the ribbons to compare them fairly. Ask: *Which ribbon is longer? Which ribbon is shorter? What makes it hard to measure the ribbons? What makes it easier?* For the longer lengths, encourage children to think about and apply Flo's comment. You may need to suggest that they use larger blocks or sets of other larger identical items. Use a footprint (photocopiable 24) as a non-standard measure.

DEEPEN Provide children with sets of three different lengths of ribbon or rope. Ask them to make their own baseline to compare and order them by length, shortest to longest. Provide a range of non-standard measures for children to choose from. Ask them to describe the ribbons using the correct terminology: *shorter* or *longer* for two ribbons, *shortest* or *longest* for three ribbons. Can they describe the length of one of the ribbons in terms of it being shorter than one and longer than another ribbon? Ask: *Which items are easy to measure with? Which items are hard to measure with? Why can you not use items of different sizes to measure?*



GET ACTIVE This activity can be reproduced in the outdoor area with longer ropes and measuring with heel-to-toe footsteps or using a footprint (photocopiable 24) as a non-standard measure. Alternatively, children can use footsteps to measure any painted lines on the playground. Discuss what happens to the measurements if they are measured with an adult's feet instead of a child's. Ask: *Can you compare the lengths if an adult measures one line and a child measures another one using their feet?*

Day 5

Learning focus

Using non-standard units to measure distance

Practical activities

WAYS OF WORKING Whole class or small groups

IN FOCUS The **Practical activities** allow children to see that measuring distance, length and height is done every day to compare and order these measures for a variety of purposes.

GET ACTIVE **Racing cars**

Ask children to set up two identical ramps and choose two cars. They release them down the ramps at the same time, without pushing them. Ask: *Which car went further? How can you measure how far the cars went?* Encourage children to consider what they will use to measure this.

Measuring learning spaces

Ask children to use identical strips of paper (about 10 cm long) to measure either the height or the length of various items of furniture in the classroom. Challenge children who are ready to show whether another item would fit in a space. Use the language of *longest*, *shortest* and *tallest*.

Tall, taller, tallest

Support children to order a set of three chairs of varying heights into height order. Discuss who each chair could be for. Ask: *Why do chairs need to be different heights?*

What is the distance?

In the playground or hall, ask some pairs of children to stand apart from each other and ask other children to measure the distance between them using either footsteps or strips of paper. Ask: *Which two children are furthest apart? Which are closest together?*

Long jump

Set up a long jump activity outside. All children jump from the same point. Place a different coloured cone on the point where each child lands. Ask them to measure how far they jumped using non-standard measures, for example footsteps, lengths of rope. Children could also practise visual comparison by saying who jumped furthest, just by looking.

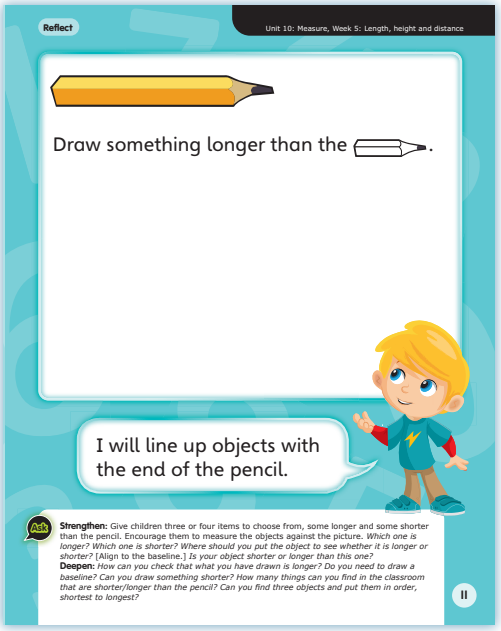
Reflect: Journal 2

WAYS OF WORKING Independent thinking

IN FOCUS The **Reflect** activity allows children to use their skills in measuring and comparing to draw something longer than the pencil. They can measure the pencil using non-standard units and look around the classroom for items that are longer and shorter.

MASTERY CHECKPOINT **Children who have mastered this concept** can use the appropriate vocabulary of *longer*, *shorter* and *taller* when describing items they have measured. They understand and can use the measuring technique of lining up items and measuring, starting from a common baseline. They are beginning to measure length, height and distance using common non-standard units.

Children who have not yet mastered this concept can use the appropriate vocabulary of *longer*, *shorter* and *taller* sometimes, but not always, in the correct context. They need support to remember to line up items and measure from a common baseline. They are beginning to explore measuring using non-standard units.



Weight

Learning focus

This week, children will be introduced to the concept of weight. They may already have some previous understanding of the meaning of *heavy* and *light* objects. They will begin to compare two items and learn how balance scales show which item is lighter or heavier.

Small steps

- Previous step: Length, height and distance
- **This step: Weight**
- Next step: Using a ten frame

COMMON MISCONCEPTIONS

Children may think that smaller objects are always lighter than larger objects. Provide opportunities to explore objects that address this misconception, for example, different-sized parcels where some smaller parcels are heavy and some larger parcels are light; large balloons and balls; large feathers and small pebbles. Ask:

- *Which is bigger? Which is smaller? Which do you think will be heavier? Which one feels heavier? How can you check? Are bigger objects always heavier?*

KEY LANGUAGE

In lesson: large, larger, largest, bigger, small, smaller, heavy, **heavier**, heaviest, light, **lighter**, lightest, equal, balanced, the same, **balance scales**, weigh, **weight**, check

Other language to be used by the teacher: estimate, predict, check, measure, compare, order

RESOURCES

Mandatory: balance scales, everyday objects for weighing and comparing (stones, shells, fruit, sand, playdough, classroom objects, toys), fruit (pineapple, banana, orange), tennis balls, teddies, wooden blocks, toy cars, balloons, multilink cubes

Optional: buckets with handles, strong elastic bands, simple spring balance, three different-sized boxes, fruit, different-sized balls, pre-prepared wrapped parcels of sand of various sizes

EXPLORE

Taking every opportunity throughout the school day to build and reinforce mathematical concepts gives children's learning purpose and meaning in the wider context of their lives.

ACTIVITY	AREA	DESCRIPTION	RESOURCES
Exploring weight with balance scales	Classroom	Provide sets of balance scales with lots of interesting items for children to weigh and compare, allowing them time to investigate and explore. Discuss how the scales show which item is heavier. Ask: *What happens when you add an item to the balance scales? Which side is heavier? Which side is lighter? Can you make the scale balance? Can you find something heavier/lighter than the ___? Can you find two objects that weigh the same?*	Sets of balance scales, items for children to weigh (stones, shells, fruit, sand, playdough, classroom objects, toys)
Investigating weight	Outside	Provide children with buckets with a strong elastic band looped through the handle for them to hold. Encourage children to place objects into their bucket and see how far the elastic band stretches (it will stretch further when the object is heavier). Ask: *Which of these objects do you think is the heaviest? What will happen when you place it into the bucket? Is your object heavier or lighter than your partner's object? How do you know? How can you check?* The same effect can be seen with a simple spring balance.	Buckets with a handle, strong elastic bands, objects to weigh and compare, simple spring balance

Day 1

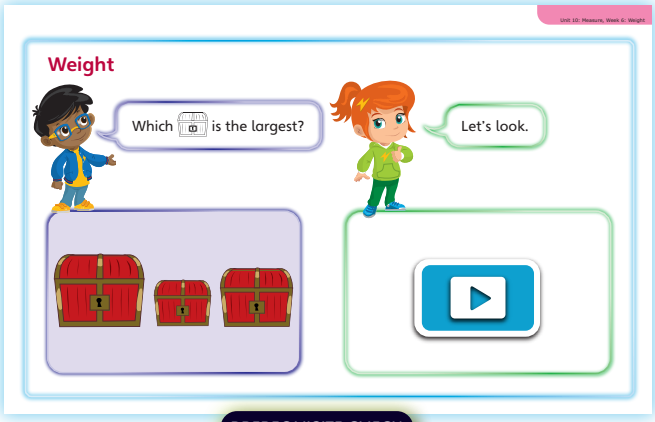
Learning focus

Understanding that on a balance scale (like a seesaw), the heavier person or object tips down and the lighter one goes up

Before you teach

- Do children understand what is meant by *heavy* and *light*?
- Can children give an example of something that is heavy and something that is light?

Starter



PREREQUISITE CHECK

PREREQUISITE CHECK Picture of three boxes.

WAYS OF WORKING Whole class

You may want to have three different-sized boxes to replicate the picture.

IN FOCUS This **Prerequisite check** ensures that children can compare objects by size, before introducing the concept of weight. Remind children that when comparing two objects you should use the words *larger* or *smaller* (comparatives) and when ordering and comparing three or more objects you use *largest* or *smallest* (superlatives).

ASK

- *What do you notice about the boxes? Are they all the same?*
- *How could you compare the boxes?*
- *Which box is largest? How can you tell?*
- *Which box is smallest?*
- *Is this box larger or smaller than this box?*

STIMULUS

STIMULUS Video of two children on a seesaw

WAYS OF WORKING Show the video of children playing on the seesaw.

IN FOCUS The **Stimulus** video shows children a familiar activity. Seeing children on the seesaw will prompt discussion about their own experiences on seesaws. Encourage children to think about what happens when one person gets on and when someone gets on the other side.

ASK

- *What happens when one person sits on a seesaw? Why do you think that is?*
- *What happens when someone else gets on the other side?*
- *How do they make the seesaw move?*
- *What happens if an adult gets on one side of a seesaw and a child on the other?*

GET ACTIVE Provide a selection of balance scales and objects of different weights to place on them. Encourage children to explore what happens when they put different items on one side of the balance scales. Ask children to add more than one item or an obviously heavier item so that they can see the pan getting lower and lower, the heavier it becomes, with the empty pan getting higher and higher. Ask: *How do the balance scales move when you put something on one side? What happens when you put something even heavier on that side? What happens when you add more things to the pan?*

Once children have established that heavier makes the pan go lower, they could explore comparing some items as described in the Exploring weight with balance scales activity from the **Explore** table. If you have access to a seesaw, encourage pairs of children to play on it and talk about what happens and what they have to do to get it moving.

Day 2

Learning focus

Comparing the weights of two objects where the heavier object is bigger

Discover

WAYS OF WORKING Whole class or small groups
Have a selection of toys available for children to compare.

IN FOCUS The focus of **Discover** is to introduce the language related to weight. Using two familiar items, children are asked to predict which one is heavier. In this representation, the bigger item is heavier, and both items are made of the same material.

ASK

- *Which toy do you think is heavier, the car or the truck? Does your partner agree?*
- *Why do you think that? How could you check?*
- *What is Aidan doing?*
- *Why do you think the hand holding the truck is lower down?*
- *What else can you see in the picture that you could compare?*

STRENGTHEN Encourage children to stand like Aidan in the picture, holding their arms out to the sides. Place objects similar to those in the picture in each hand. Prompt discussion around which is heavier and which is lighter. Ask: *Do the toys feel the same? How do they feel different? How would your arms move if you were a seesaw? Which side would go down?* Repeat with other objects from the classroom.

DEEPEN Children use their hands to compare two toys similar to those in the picture. Provide a third toy and ask children to 'weigh' the items using their hands to compare the toy to each of the other toys. Encourage them to try to put the toys in order from lightest to heaviest. Model stem sentences to compare the toys and to say which is heaviest and lightest overall: *The ___ is heavier than the ___. The ___ is lighter than the ___. The ___ is the heaviest. The ___ is the lightest.*

Share

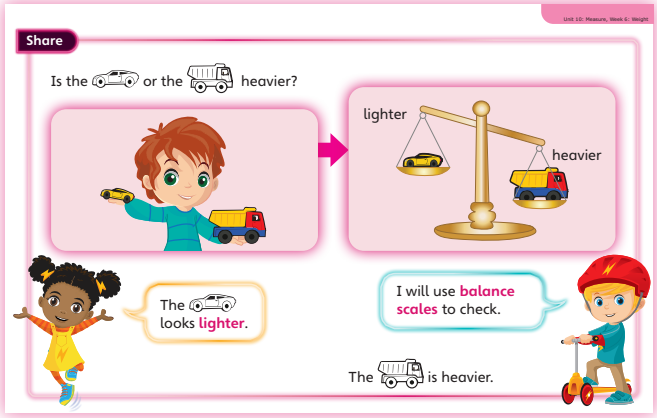
WAYS OF WORKING Whole class
Ensure children have a range of objects to explore.

IN FOCUS The focus of **Share** is to introduce children to using balance scales to compare weight. These help children to see that the truck is heavier because it has moved the pan on the scales downwards. Reinforce the key language of *heavy, heavier, heaviest, light, lighter* and *lightest* and provide stem sentences to support children: *The ___ is heavier than the ___. The ___ is lighter than the ___.*

ASK

- *Why does Flo think the car is lighter?*
- Point to the balance scales. *Do you know what this is?*
- *What happens when the toys are put on the balance scales?*
- *What does it mean when the pan goes down? What does it mean when the pan goes up?*
- *Do the balance scales remind you of anything?* [A seesaw.]
- *Which toy is heavier? Which toy is lighter? How do you know?*
- *What would happen if you took the truck off?*
- *What would happen if you swapped the toys over?*

STRENGTHEN Provide a selection of balance scales on which children can place the toys they used in **Discover**. Prompt them to predict how the balance scales will move before adding the items and then to describe what they see. Ask:



What do you think will happen? Why? Encourage children to use stem sentences.

DEEPEN Encourage children to select three different objects from around the classroom and to order them from lightest to heaviest, first by estimating or 'weighing' on their hands and then using a balance scale to check.

GET ACTIVE Hold up two objects, one in each hand. Ask children to stand with their arms out like balance scales. Prompt children to show which object they think will be heavier by moving their arms up or down. Repeat with different objects, using real balance scales to check.

Day 3

Learning focus

Comparing the weights of two objects that are a similar size

Think together

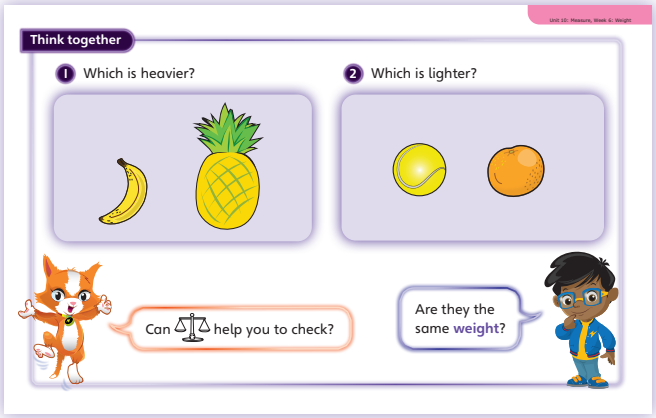
WAYS OF WORKING Whole class or small groups

Children will need balance scales, the same fruit as in the picture and a tennis ball to check which items are heavier and lighter. Provide different fruits for children to explore further.

IN FOCUS In the **Think together**, the focus is on estimating then checking which item is heavier using the method modelled in **Share**. In Question 1, children predict which item of fruit will be heavier. The small step of progression in Question 2 is comparing items of a similar size but different weights to predict which is lighter. This begins to introduce the idea that size does not always indicate which item is heavier.

ASK

- Question 1: *Can you describe the fruit?*
- Question 1: *Which piece of fruit do you think is heavier? How do you know? Which is lighter?*
- Question 2: *Can you describe the items? What do you notice about them?* [Both are a similar shape and size.]
- Question 2: *Which item do you think is heavier?*
- Question 2: *What happens when you put both items on the balance scales? Is that what you expected? Can you find any items that do balance the scales?*
- Questions 1 and 2: *Which fruit, the orange, the banana or the pineapple, do you think will be the lightest? Which will be the heaviest fruit? How can you use the balance scales to check?*



STRENGTHEN Allow children time to explore and compare the weights of the different fruits. Encourage them to use the stem sentences throughout to reinforce their understanding of the vocabulary. Remind them that the heavier object will pull the scales down and so the lighter object will go up.

DEEPEN Ask children to find three objects that they think will be lighter than the banana and three that they think will be heavier. Encourage them to use the balance scales to check.

GET ACTIVE Allow children to compare the weight of different-sized balls from the PE cupboard. Are the larger balls always heavier? Can they find two balls of a similar size where one is clearly heavier, for example, a small soft ball and a rounders ball?

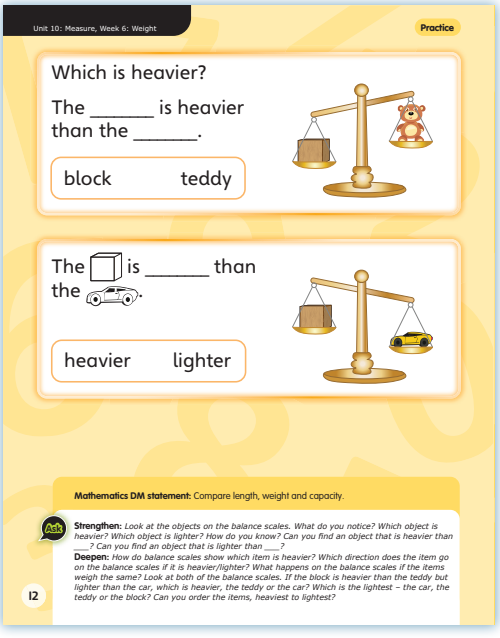
Practice: Journal 1

WAYS OF WORKING Independent thinking

Provide real balance scales, teddies, wooden blocks and toy cars so that children can try out this activity practically.

IN FOCUS The focus of the **Practice** activity is for children to use balance scales to identify which objects are heavier or lighter. In the first part, children can write or draw objects into the sentence to describe which item is heavier. In the second part, a word bank lists key vocabulary for children to use in the sentence.

MASTERY CHECKPOINT Children who have mastered this concept can correctly complete stem sentences to compare the weights of objects. They can explain how they know and may refer to the heavier object pulling the balance scales down.



Day 4

Learning focus

Comparing the weights of two objects where the heavier object is smaller

Challenge

WAYS OF WORKING Whole class

Provide balance scales and items to match those in the picture.

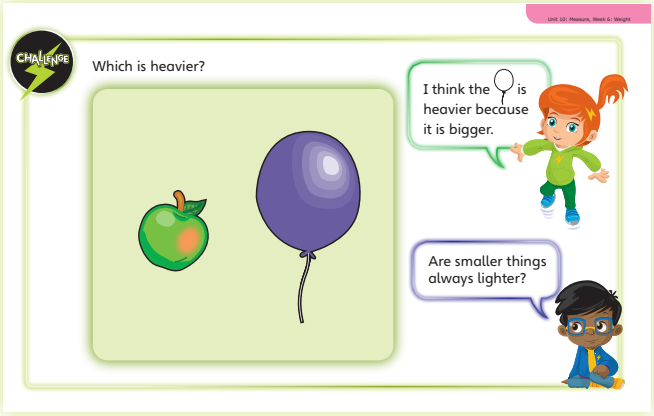
IN FOCUS The **Challenge** explores the common misconception that bigger objects are always heavier. Children's previous experience may have led them to believe that this is always the case and this misconception can be challenged here. The characters prompt thinking around this, and children should be encouraged to pick up real objects to see which they think is heavier and to test them on balance scales.

ASK

- *Why does Astrid think the balloon will be heavier? What do you think?*
- *Do you think the apple is heavier? Why?*
- *How could you check?*
- *Can you think of any other small objects that are heavy?*
- *Can you think of any other large objects that are light?*
- *How would you answer Ash's question?*

STRENGTHEN Encourage children to compare the weights of a balloon and an apple by holding one in each hand. Ask: *Which is bigger? Which is smaller? Which feels heavier? Which feels lighter?* Remind them of the human balance scales activity. Can they make the heavy object push their hand down and make the other hand go up? Prompt them to compare the weights of the objects using stem sentences.

DEEPEN Challenge children to find other large objects that are light and small items that are heavy, as well as to find objects of a similar size that are very different weights. Ask: *Is it possible to tell how heavy an object is just by looking at it? What do you need to do? What do you sometimes think when you see a large object? Is this always right?*



GET ACTIVE In advance, use sand to create parcels of different weights, ensuring that some of the smaller parcels are heavy and some of the larger parcels are light. Use different coloured or patterned paper to wrap the parcels for easy comparison. Provide balance scales and a set of parcels for each small group of children. Encourage children to estimate first by just looking at the parcels, then by holding them, ordering them lightest to heaviest. Ask them to compare two of the parcels: *The striped parcel is heavier than the spotty one*, for example. They then use balance scales to check. Ask: *Which parcel do you think will be the heaviest? Now that you have held them, do you still think that one is the heaviest? How could you check? Are big parcels always heavier than small parcels?*

Day 5

Learning focus

Using non-standard units to measure the weight of objects

Practical activities

WAYS OF WORKING Whole class or small groups

IN FOCUS The **Practical activities** introduce the concept of using non-standard units to measure the weight of objects.

GET ACTIVE **How many cubes? (1)**

Provide balance scales, multilink cubes and a selection of objects for each small group of children to weigh, using multilink cubes as a non-standard measure. Children find how many cubes it takes to balance each object. Encourage them to say the stem sentence: *A ___ weighs about the same as ___ cubes.* Children then make a tower of the cubes and put it alongside the item weighed. When they have weighed another item, they compare the two items, using the towers of cubes to show which item is heavier. After weighing a third item, children could put the items in order, lightest to heaviest, using the towers of cubes to help them. Ask: *How many cubes will be needed to balance a banana? How many cubes weigh about the same as the toy car? How does this help you to see which item is heavier?* Help children to discover that heavier items will need more cubes to balance the scales.

How many cubes? (2)

Give groups of children some items that will weigh less than 20 cubes. Provide plenty of multilink cubes and balance scales. Ask children to predict how many cubes will be needed to make an object balance. They use balance scales to check their predictions and then put their items in order, heaviest to lightest. Allow children time to investigate further objects. Ask: *Can you find an item that weighs about the same as 5 cubes? About the same as 10 cubes?*

Heavier or lighter

Give each child an object and ask them to find something heavier and something lighter. Encourage them to think about how they could check. If they have not used cubes as a non-standard measure, as in the above activities, give them the opportunity to use this method here.

Reflect: Journal 2

WAYS OF WORKING Independent thinking

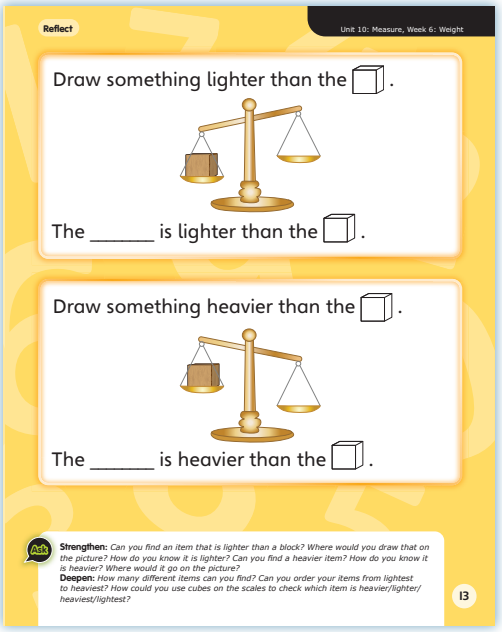
Some children may benefit from having a wooden block to physically compare when searching, as well as to check. Provide balance scales so children can check the objects they have found before they record their answer.

IN FOCUS The **Reflect** activity allows children to consolidate their understanding on weight. Encourage children to look around the classroom to find objects that they think will be heavier and lighter than a wooden block and use balance scales to check. They can then draw their object onto the balance scales in the journal, and use pictures or words to complete the stem sentences.

MASTERY CHECKPOINT **Children who have mastered this concept** can find objects that are heavier and lighter than a given object, use balance scales to check and describe the comparison using stem sentences.

Children who have not yet mastered this concept can find objects that are heavier and lighter than a given object and use balance scales to check with adult support. They need prompting to remember that heavy objects will pull the balance scales down.

Children who fully understand this concept may want to use non-standard units to measure and compare weight, and order a small number of objects from heaviest to lightest.


Reflect

Unit 10: Measure, Week 6: Weight

Draw something lighter than the .

The _____ is lighter than the .

Draw something heavier than the .

The _____ is heavier than the .

Strengthen: Can you find an item that is lighter than a block? Where would you draw that on the picture? How do you know it is lighter? Can you find a heavier item? How do you know it is heavier? Where would it go on the picture?
Deepen: How many different items can you find? Can you order your items from lightest to heaviest? How could you use cubes on the scales to check which item is heavier/lighter/heaviest/lightest?

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