RICH MATHEMATICAL TASK BOOKLET

MEASUREMENT

YEAR 2

Teacher Booklet

© Bobbie and Jodie Hunter

Task 1

Amaya has some mala flower garlands for her sisters wedding. She wants to keep the longest one for her sister.

Use measurement units to work out which is the longest flower garland.

Record the measurement unit and measurement count.

Teacher Notes

Before you launch the task, ask the students to work out who has the longest walk home between Paige and Leith (see Task 1 warm-up copy-master). Have sets of objects that the students can use to measure (e.g., centi-cubes, multilink, rods, match-sticks) and ensure that there is enough objects in the set that they can cover the entire length to be measured.

To launch the task, challenge the students to see if they can use one or two of the measurement units to measure the lengths of string.

Have three lengths of string (between 30 - 40 centimetres in length if using cubes or 40 - 50 centimetres if using longer rods) for each student to measure and then sets of centi-cubes, multilink cubes, matchsticks or rods to use as the unit of measure.

Ask students to measure using a single unit or two units. Observe the students measuring and if some students are unable to measure using single/two units then give them a set to cover the entire length to be measured.

Use the word length explicitly to describe the linear measurement. Also support students to give the unit of measure in their explanation (e.g., “the length was 32 centi-cubes long”).

Facilitate students to notice how they can keep track of where the cube ended (using a finger or pen mark) so they know where to move it next.

Support the students to use grouping to record their measurement counts. For the independent task, have objects that the students can use to estimate and measure with cubes.

Big Ideas

There are a range of attributes that we can measure including length, mass, time, area, angle, and volume. When we measure, we use comparison, specifically, we compare like properties to see which is greater. We can make comparisons using standard or non-standard units of measure and we use mathematical language to describe these.

Conceptual understanding of measurement requires understanding of conservation and transitivity. Conservation requires understanding that when moved or subdivided, an object will retain its size. Transitivity involves understanding that the measures of two objects can be compared to a third object. For example, if object A weighs more than object B, and object B weighs more than object C, then object A will weigh more than object C.

There are key principles related to measurement including that the size of the measurement unit remains the same (including identical units or subdivisions), units are repeated with no gaps or overlaps (iteration), the unit is part of a whole and the measurement is expressed as the total number of units used.

Shareback

Select students to share who could measure using one measurement unit while ensuring that there are no gaps (using a finger or pen mark each time) and using iteration accurately.

Connect

Ask students to measure one of the lengths of string using a different measurement unit and record the measurement count. Ask the students to discuss why they got a different measurement count when using a different measurement unit and highlight the relationship between the size of the measurement unit and the measurement count.

Suggested Learning Outcomes

Use non-standard units to measure length.

Count whole numbers of units to describe the measurement.

Compare length using non-standard units.

Use measurement language to describe the comparison of length

Independent Tasks

Measuring with multilink cubes. Estimate how long each object is, write your estimation down. Measure using the cubes and record.

I estimate the _____ is _____ blocks in length. It was _____ blocks.
I estimate the _____ is _____ blocks in length. It was _____ blocks.
I estimate the _____ is _____ blocks in length. It was _____ blocks.
I estimate the _____ is _____ blocks in length. It was _____ blocks.
I estimate the _____ is _____ blocks in length. It was _____ blocks.

Curriculum Links

During Year 2
Estimate and use an informal unit repeatedly to measure the length, mass (weight), volume or capacity.

Compare and order several objects using informal units of length, mass (weight), volume, or capacity.

Mathematical Language

Length, unit of measure, measurement count, longest, shortest, same.

Anticipations

Solutions, Misconceptions

Task 2

1) Use one stick to measure the card strip. Record the measurement unit and measurement count.

Draw on the card strip to show how you measured it.

2) Look at the ruler. What is the same? What is different?

3) Use a card strip to make a ruler with stick units.

4) Look at your card strip ruler and a ruler.

What do you notice? What is the same? What is different?

5) Draw another card strip ruler which you have improved.

Teacher Notes

Have matchsticks or ice-block sticks about 3 centimetres long and card strips that are all the same length but also the same whole number of times in length (e.g., if the matchstick is 3cm then the card strip can be 18cm or 21cm). Have centimetre rulers.

Launch each question individually and shareback after each one. Follow the shareback suggestions.

Notice how the students are measuring the card strip and ensure that they all get the same measurement count.

Notice how the students represent how they measured, they may draw each stick separately or alternatively they may mark the end of the measurement stick each time which is both more efficient and ensures that there are no gaps.

Support students to notice that if you do not have numbers on the ruler, it means that you still have to count the number of measurement units. Labelling the marks on the ruler with numbers means that you don't have to count the number of measurement units.

Notice how the students are measuring using the stick rulers and ensure that they get the same measurement count when measuring with the stick.

For the independent task, provide the stick ruler and a set of objects to measure which are smaller than the total length of the stick ruler.

Big Ideas

There are a range of attributes that we can measure including length, mass, time, area, angle, and volume. When we measure, we use comparison, specifically, we compare like properties to see which is greater. We can make comparisons using standard or non-standard units of measure and we use mathematical language to describe these.

Conceptual understanding of measurement requires understanding of conservation and transitivity. Conservation requires understanding that when moved or subdivided, an object will retain its size. Transitivity involves understanding that the measures of two objects can be compared to a third object. For example, if object A weighs more than object B, and object B weighs more than object C, then object A will weigh more than object C.

There are key principles related to measurement including that the size of the measurement unit remains the same (including identical units or subdivisions), units are repeated with no gaps or overlaps (iteration), the unit is part of a whole and the measurement is expressed as the total number of units used.

Shareback

For the first question, ask students to share their drawings of how they measured and to compare these. Ask them to discuss how they are the same? Different? Why way works best and why? Select a student to share who has just marked the end of the measurement stick each time:

If no students have done this then introduce it as a way that previous students have used.

For the second question, select students to share who notice that a ruler is longer and has more marks on it and numbers but that both the measurement drawing and ruler has equal spacing. If no students notice this, then use questioning to highlight it.

For the fourth question, select students to share who notice that rulers have marks that begin at the edge of the strip and numbers on them. Ask all students to discuss what the numbers mean. Ask students to redraw their rulers and improve them.

Finally, select students to share who have put the marks at the edge and written the numbers. If no students have done this, then support all students to redraw the ruler with the marks at the edge and numbers.

Connect

Have a set of objects that have shorter than the length of the stick ruler. Ask students to measure an object using their ruler then measure the same object using the stick.

Ask is your measurement count the same or different?

Curriculum Links

During Year 2

Estimate and use an informal unit repeatedly to measure the length, mass (weight), volume or capacity.

Compare and order several objects using informal units of length, mass (weight), volume, or capacity.

Mathematical Language

Length, unit of measure, measurement count, ruler.

Suggested Learning Outcomes

Use non-standard units to measure length.

Count whole numbers of units to describe the measurement.

Compare non-standard measurement with a ruler.

Create a ruler with non-standard units.

Use a ruler with non-standard units to measure objects.

Independent Tasks

Choose an object to measure using your stick ruler. Record the measurement count.

Measure the same object using one stick. Record the measurement count.

Is the measurement count the same or different?

Measure different objects with your stick ruler and then check if you get the same measurement count when you measure with one stick.

Anticipations

Solutions, Misconceptions

Task 3

Padma is decorating a picture frame with shells for her Amma's birthday (see Copy Masters).

Use your stick ruler to find the perimeter of the picture frame. Record your measurement unit and measurement count.

Find the shells that Padma should use to best fit the picture frame by measuring them. Record your measurement unit and measurement count for each shell.

Teacher Notes

Before the launch, remove the rulers and drawings and give the students a new card strip and ask them to draw a ruler that could be used for measuring objects in stick units from memory. Ask the students to compare their drawing with other students drawing.

During the launch, introduce students to the term perimeter and explain that the distance around the edge of a flat object is called its perimeter. Have a range of flat objects (pictures, books, cards) and trace your finger around the perimeter and ask students to do the same.

Have students 'stick rulers' for them to measure the perimeter and the shells. The students can choose any shells to decorate the border and the focus should be on the measurement process using the stick ruler.

Facilitate the students to notice that they need to place the left end of the ruler against the end of the part of the perimeter that they are measuring.

Expect students to use measurement language including perimeter.
For the independent task, have square or rectangular pictures of different sizes for the students to measure the perimeter. Ensure that the sides are smaller than the stick ruler.

Shareback

Select students to share who are able to accurately measure the perimeter using their ruler and select appropriate shells that will fit within the measurement.

Big Ideas

There are a range of attributes that we can measure including length, mass, time, area, angle, and volume.

When we measure, we use comparison, specifically, we compare like properties to see which is greater. We can make comparisons using standard or non-standard units of measure and we use mathematical language to describe these.

There are key principles related to measurement including that the size of the measurement unit remains the same (including identical units or subdivisions), units are repeated with no gaps or overlaps (iteration), the unit is part of a whole and the measurement is expressed as the total number of units used.

Curriculum Links

During Year 2

Visualise, estimate, and measure the perimeter and area of 2D shapes, using informal units.

Connect

Show students a shorter stick then than used for their stick rulers. If you made a ruler using the shorter stick, how would that change the ruler? How would it change your measurement of the perimeter?

Mathematical Language

Perimeter, length, unit of measure, measurement count, ruler.

Suggested Learning Outcomes

Use a ruler with non-standard units to measure objects.

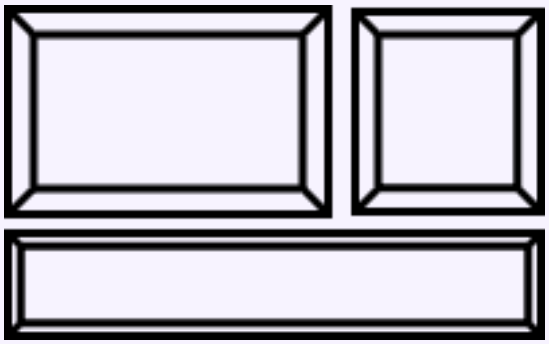
Find the perimeter of a flat object.

Use measurement language to describe how to measure area.

Independent Tasks

Padma needs to get picture frames for the pictures her Amma's birthday.

Use your stick ruler to find the perimeter of each picture.



Record your measurement unit and measurement count.

Anticipations

Solutions, Misconceptions

Task 4

Which table in the classroom has the largest area?

Estimate how many squares you will need to cover the table.

Measure the table. Record your measurement unit and the measurement count.

Teacher Notes

Before the launch, informally discuss with students the area of different spaces around the school. For example, which takes up the larger amount of space, the field or the courts? Which room has the largest amount of floor space?

During the launch, introduce students to the term area and explain that the area is the amount of space inside a 2D shape (the surface). Begin by asking students to feel the area of a single table (by running their hands over the top). Ask students to discuss how the area of a single table would compare with two tables joined together.

Have large square measures to use to measure the area of the table (template in copy masters). Each pair of students should have enough squares to cover as much of the entire table to be measured as possible.

Note, the measurement count will be approximate because it is unlikely the squares will exactly cover the table.

Facilitate the students to notice that they need to place the squares carefully with no gaps or overlaps and starting at one edge of the table.

Expect students to use measurement language including area.

For the independent task, have sets of large squares for students to use to measure. You might help students write the areas to measure before they begin the independent activity.

Shareback

Select students to share who are able to accurately measure the area using the measurement squares by covering the table and ensuring no gaps or overlaps. If no students do this then model it as a solution that a previous student used.

Big Ideas

There are a range of attributes that we can measure including length, mass, time, area, angle, and volume. When we measure, we use comparison, specifically, we compare like properties to see which is greater. We can make comparisons using standard or non-standard units of measure and we use mathematical language to describe these.

Conceptual understanding of measurement requires understanding of conservation and transitivity. Conservation requires understanding that when moved or subdivided, an object will retain its size. Transitivity involves understanding that the measures of two objects can be compared to a third object. For example, if object A weighs more than object B, and object B weighs more than object C, then object A will weigh more than object C.

There are key principles related to measurement including that the size of the measurement unit remains the same (including identical units or subdivisions), units are repeated with no gaps or overlaps (iteration), the unit is part of a whole and the measurement is expressed as the total number of units used.

Connect

Facilitate a discussion asking the students: How would you measure the area of the whole classroom?

Suggested Learning Outcomes

Use non-standard units (squares) to measure area.

Estimate the area of surfaces using non-standard units.

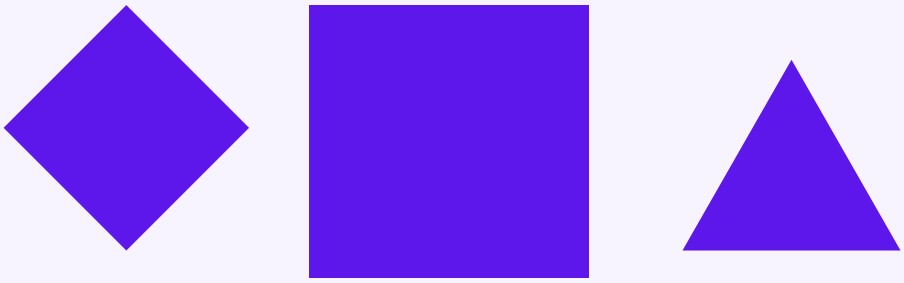
Find the area of a surface.

Use measurement language to describe how to measure area.

Independent Tasks

What is the perimeter of these shapes?

Use your stick ruler to find the perimeter of each shape.



Record your measurement unit and measurement count.

Curriculum Links

During Year 2

Visualise, estimate, and measure the perimeter and area of 2D shapes, using informal units.

Mathematical Language

Area, surface, square, unit of measure, measurement count.

Anticipations

Solutions, Misconceptions

Task 5

Mereana is working with a group of Mamas to make a tivaevae ta'orei.
With the squares you can make a pattern for Mereana's tivaevae ta'orei.

Make a pattern that has an area of 16 squares by connecting the square pieces.

Teacher Notes

During the launch, remind the students of the term area and that the area is the amount of space inside a 2D shape (the surface). Show students pictures of tivaevae ta'orei which are made from small squares. Tell the students that when they make their pattern, the squares need to be touching but they can't be overlapping.

Use different coloured paper for the squares and a piece of blank paper (template in copy masters)

Give the students time to explore putting the squares together in different ways and making different patterns. Facilitate the students to notice that they need to place the squares carefully with no gaps or overlaps.

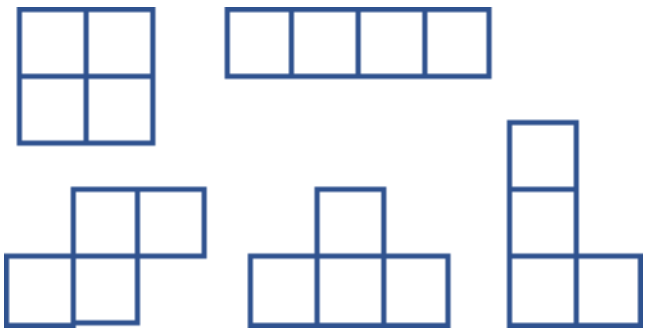
When the student is happy with their design, they can glue or tape the squares to the paper.

Shareback

Select students to share who have developed different patterns/arrangements with the 16 squares. Ask students the area of each pattern and support them to notice that all of the patterns have the same area but they look different.

Connect

Facilitate a discussion: Do these shapes have the same or different area?



Big Ideas

There are a range of attributes that we can measure including length, mass, time, area, angle, and volume. When we measure, we use comparison, specifically, we compare like properties to see which is greater. We can make comparisons using standard or non-standard units of measure and we use mathematical language to describe these.

Conceptual understanding of measurement requires understanding of conservation and transitivity. Conservation requires understanding that when moved or subdivided, an object will retain its size. Transitivity involves understanding that the measures of two objects can be compared to a third object. For example, if object A weighs more than object B, and object B weighs more than object C, then object A will weigh more than object C.

There are key principles related to measurement including that the size of the measurement unit remains the same (including identical units or subdivisions), units are repeated with no gaps or overlaps (iteration), the unit is part of a whole and the measurement is expressed as the total number of units used.

Suggested Learning Outcomes

Use non-standard units (squares) to measure area.

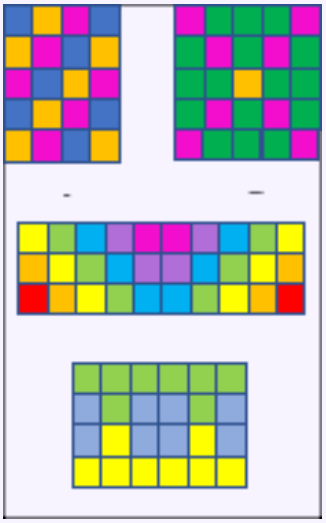
Make an area to a given amount.

Identify and explain that the same area can be represented differently.

Use measurement language to describe how to measure area.

Independent Tasks

These are some patterns that Mereana has made for her tivaevae ta'orei.



What is the area of each of the designs?

Curriculum Links

During Year 2

Visualise, estimate, and measure the perimeter and area of 2D shapes, using informal units.

Mathematical Language

Area, surface, square, unit of measure, measurement count.

Anticipations

Solutions, Misconceptions

Task 6

Mereana is preparing a chilly bin full of banana poke to sell at the Pasifika festival. She would like to know which chilly bin will fit the most containers of poke. How many can she fit in each chilly bin and still shut the top?

Teacher Notes

During the launch, use food packets of different sizes. Have children order from biggest to smallest and discuss with the children which takes up the most space (volume).

Have three bins (or large boxes) for the students to work with and use glad containers or lunch-boxes which are the same size as the measurement unit.

Facilitate the students to notice the need for a common measurement unit to compare.

Monitor for students using vocabulary which includes space, volume, and more than, less than and the same as.

Notice students who use grouping or counting on to find the number of measurement units. If these are not used, model how to use them.

Expect students to represent their solutions using drawing and numbers.

For the independent task, have different sized containers available and sets of blocks, multi-link cubes, and/or foam shapes to use as the measurement unit.

Shareback

Select students to share who measure the volume of the boxes in a systematic way by layering the bottom first and then filling the rest of the box and ensuring that there are as little spaces as possible.

Teacher to model recording the solutions using representations involving numbers and drawing.

Big Ideas

There are a range of attributes that we can measure including length, mass, time, area, angle, and volume.

When we measure, we use comparison, specifically, we compare like properties to see which is greater. We can make comparisons using standard or non-standard units of measure and we use mathematical language to describe these.

There are key principles related to measurement including that the size of the measurement unit remains the same (including identical units or subdivisions), units are repeated with no gaps or overlaps (iteration), the unit is part of a whole and the measurement is expressed as the total number of units used.

Curriculum Links

During Year 2

Estimate and use an informal unit repeatedly to measure the length, mass (weight), volume or capacity.

Compare and order several objects using informal units of length, mass (weight), volume, or capacity.

Connect

Show the students bigger or smaller containers and ask them to discuss how many of each packet would fit in the chilly bin and compare to the number of measurement units for the first unit. Facilitate students to notice that the bigger the measurement unit the more space it takes and therefore less would fit in the same size chilly bin and vice versa.

Mathematical Language

Space, volume, more than, less than, same, measurement unit, measurement count, greatest.

Suggested Learning Outcomes

Compare the volume of a container using non-standard units.

Use non-standard units to measure volume.

Count whole numbers of units to describe the measurement.

Explain the relationship between size of the measurement unit and the measurement count.

Estimate the volume of a container.

Independent Tasks

Use the different material to measure the volume of each container.

Record the measurement count for each different measurement unit that you used. Draw a picture to show how you measured the different containers and write the numbers to match.

Anticipations

Solutions, Misconceptions

Task 7

Sione is making a treasure box for a pirate party. He is wondering which box has the largest volume. Can you help him by measuring the volume of the boxes?

Teacher Notes

For the launch, ask show students the boxes and ask them to estimate which would have the largest volume measurement.

For the task, have a collection of small boxes (e.g., shoe boxes) and either centi-cubes (these are best given they are a standard one cm measurement unit) or multi-link cubes.

Facilitate students to notice that the volume of an object is the amount of space it takes up and that the volume of an object is measured by the number of unit volumes that fit into it.

Expect students to record and use representations to show their thinking.

For the independent task, have a collection of different sized and similar boxes or containers. Give the students the centi-cubes to find the volume.

Shareback

Select students to share who measure the volume of the boxes in a systematic way by layering the bottom first and then filling the rest of the box and ensuring that there are as little spaces as possible. Also focus attention on students who use grouping or counting on solutions to find the measurement unit count.

Connect

Select one of the volume measurements that were shared and ask the students to think about the volume (in total) if the box was cut into two pieces and volume of each piece was measured. Support them to understand that the volume would be the same (conservation)

Then select a box where the 1 cm cube did not fit exactly and ask students to discuss how you could get an accurate volume measurement (e.g., using fractions).

Big Ideas

There are a range of attributes that we can measure including length, mass, time, area, angle, and volume.

When we measure, we use comparison, specifically, we compare like properties to see which is greater. We can make comparisons using standard or non-standard units of measure and we use mathematical language to describe these.

There are key principles related to measurement including that the size of the measurement unit remains the same (including identical units or subdivisions), units are repeated with no gaps or overlaps (iteration), the unit is part of a whole and the measurement is expressed as the total number of units used.

Curriculum Links

During Year 2

Estimate and use an informal unit repeatedly to measure the length, mass (weight), volume or capacity.

Compare and order several objects using informal units of length, mass (weight), volume, or capacity.

Suggested Learning Outcomes

Compare and order the volume of objects.

Explain volume as the space inside an object/container.

Use units to measure volume.

Count whole numbers of units to describe the measurement.

Explain that when an object is subdivided the volume remains the same (conservation).

Independent Tasks

What box has the most volume?
What box has the least volume?
Which boxes have the same volume?

Represent how you found the volume for each box and label which one has the most volume, the least volume, and same volume.

Mathematical Language

Space, volume, most, least, same.

Anticipations

Solutions, Misconceptions

Task 8

How many children would fit in the one metre cube?

Can you work out the volume of these big boxes and work out which has the greatest volume, the smallest volume and similar volume?

Teacher Notes

Use metre rulers and card and newspaper to construct the cuboid. Use the term cubic metre and record as 1 m^3.

For the second part of the task, have large boxes for the students to compare and estimate the volume.

Monitor for students using vocabulary which includes space, volume, and more than, less than and the same as. Encourage the use of cubic metre.

Facilitate students to understand that volume is the space inside a unit.

For the independent task have a variety of pictures showing different volumes (e.g., fish tank, shipping container, warehouse).

Shareback

Select students to share who measure the volume of the boxes by visualising how the space could be filled or by comparing to the cubic metre.

Connect

Ask the students to visualise and estimate how many of the cubic metres would fill spaces around the school (e.g., classroom, bathroom, hallway, hall). Model recording student responses as m^3.

Big Ideas

There are a range of attributes that we can measure including length, mass, time, area, angle, and volume.

When we measure, we use comparison, specifically, we compare like properties to see which is greater. We can make comparisons using standard or non-standard units of measure and we use mathematical language to describe these.

There are key principles related to measurement including that the size of the measurement unit remains the same (including identical units or subdivisions), units are repeated with no gaps or overlaps (iteration), the unit is part of a whole and the measurement is expressed as the total number of units used.

Curriculum Links

During Year 2

Estimate and use an informal unit repeatedly to measure the length, mass (weight), volume or capacity.

Compare and order several objects using informal units of length, mass (weight), volume, or capacity.

Suggested Learning Outcomes

Use non-standard units to measure volume.

Compare the volume of a container using non-standard units.

Count the number of units to describe the measurement.

Mathematical Language

Space, volume, more than, less than, same, divide.

Independent Tasks

Look at the cubic metre and use this to estimate the volume of the spaces in the pictures. Record your estimations in cubic metres and make sure you use m^3.

What has the largest volume?
What has the smallest volume?
Which have similar volumes?

Anticipations

Solutions, Misconceptions

Task 9

Use the cubes to build different cuboids.
Draw a representation of the cuboid and record the volume.

Teacher Notes

For the launch, with the students make a 3 by 3 grid of 1 cm cubes. Have them make another 3 by 3 layer on top of it to make a cuboid. Have the students talk about the dimensions of the cuboid that you have made together and how many cubes it contains. Have them decide what its volume is.

Emphasise how the shape of objects could be different but have the same volume.

Shareback

Select students to share who have used grouping to find the measurement unit count. Ask them to represent their solutions using drawing and number sentences or model this to them.

Connect

Show students different models of cuboids made from the centi-cubes. Ask them say what the volume is for each one. Include some cuboids that are a different shape but the same number of cubes to highlight that the volume can remain the same even if they look different.

Big Ideas

There are a range of attributes that we can measure including length, mass, time, area, angle, and volume.

When we measure, we use comparison, specifically, we compare like properties to see which is greater. We can make comparisons using standard or non-standard units of measure and we use mathematical language to describe these.

There are key principles related to measurement including that the size of the measurement unit remains the same (including identical units or subdivisions), units are repeated with no gaps or overlaps (iteration), the unit is part of a whole and the measurement is expressed as the total number of units used.

Curriculum Links

During Year 2

Estimate and use an informal unit repeatedly to measure the length, mass (weight), volume or capacity.

Compare and order several objects using informal units of length, mass (weight), volume, or capacity.

Suggested Learning Outcomes

Use units to measure volume.

Use grouping to find the volume of cuboids.

Compare and order the volume of objects.

Count whole numbers of units to describe the measurement.

Mathematical Language

Mass, same, different, heavier, lighter, less mass, more mass, massive.

Independent Tasks

Three cuboids have the same volume but different shapes. Build these cuboids out of 1 cm cubes and then draw representations of your models showing how different shaped cuboids can have the same volume.

Anticipations

Solutions, Misconceptions

Task 10

Make different number lines to match the measurement markings on the measuring jug.

Teacher Notes

For the launch, have students explore different containers which are marked in millilitres (mL) and identify the unit of measure being used. Discuss how this is used when there is not exactly a litre.

Use a measuring jug that is cylindrical in shape and has millilitre markings (e.g., 500 mL, 740 mL, 1000 mL, 2000 mL).

Facilitate students to ensure equal spacing between their marks and understand that the space between them represents slices of equal volume.

Support students to use skip counting in 100s (or other combinations) to work out that one litre is 1000 mL. Use number lines to represent these.

Make links to the terms, millilitre, and millimetre, and that milli represents one thousand.

For the independent task, have a selection of cylindrical jugs both with millilitre markings and unmarked containers.

Shareback

Select students to share who have used equally spaced marks on the number line and represent equal volume between measurements. Encourage and model the use of standard unit measurement language (e.g., millilitres, litres, 500mL is halfway to 1L).

Connect

Show the students a picture of a number line from 50 mL to 1000 mL marked in a scale without numbers. Ask them to identify how many millilitres are represented at specific points.

Big Ideas

There are a range of attributes that we can measure including length, mass, time, area, angle, and volume.

When we measure, we use comparison, specifically, we compare like properties to see which is greater. We can make comparisons using standard or non-standard units of measure and we use mathematical language to describe these.

There are key principles related to measurement including that the size of the measurement unit remains the same (including identical units or subdivisions), units are repeated with no gaps or overlaps (iteration), the unit is part of a whole and the measurement is expressed as the total number of units used.

Curriculum Links

During Year 2

Estimate and use an informal unit repeatedly to measure the length, mass (weight), volume or capacity.

Compare and order several objects using informal units of length, mass (weight), volume, or capacity.

Suggested Learning Outcomes

Use standard units to describe and measure capacity.

Count whole numbers of units to describe the measurement.

Represent measurement scales in different ways.

Independent Tasks

Estimate how many millilitres would fit in each container. Write your estimate down.

Use one of the measuring jugs to compare how much liquid in millilitres the container would hold.

Make a number line which shows the scale for each container.

Mathematical Language

Space, capacity, volume, more than, less than, same, estimate, measurement unit, measurement count, full, half full, half empty, three-quarters full, millilitres, mL, litre, L.

Anticipations

Solutions, Misconceptions

Task 11

Here are some bags. Fill them up with different materials or objects.

Use the balance scale to weigh the sets of objects with the one kilo mass.

Can you find some objects that have the same mass?

Can you find some objects that have less mass?

Can you find some objects that have more mass?

What mass in kilograms do the different sets of objects have?

Teacher Notes

To launch the task, ask students if they have heard the word 'kilogram' and what they think it means. Have bags of objects which have a mass equivalent to 1 kg. Let the students hold it.

For the task, have bags and sets of objects that students can put in the bags and compare with the one kilogram mass. Have balance scales available for students to use.

Facilitate the students to notice that the mass of the object is measured by the number of unit masses that balance it.

Expect students to use measurement language and to record their measurements using kg.

For the independent task, have a variety of different objects to measure and balance scales available for students to use.

Shareback

Select students to share who are using a range of measurement language including unit measures to describe what they notice.

Connect

Have pictures of sets of different objects (e.g., feathers, marbles) and ask the students to predict whether they have a mass equivalent to one kilogram or more or less and why.

Big Ideas

There are a range of attributes that we can measure including length, mass, time, area, angle, and volume.

When we measure, we use comparison, specifically, we compare like properties to see which is greater. We can make comparisons using standard or non-standard units of measure and we use mathematical language to describe these.

There are key principles related to measurement including that the size of the measurement unit remains the same (including identical units or subdivisions), units are repeated with no gaps or overlaps (iteration), the unit is part of a whole and the measurement is expressed as the total number of units used.

Curriculum Links

During Year 2

Estimate and use an informal unit repeatedly to measure the length, mass (weight), volume or capacity.

Compare and order several objects using informal units of length, mass (weight), volume, or capacity.

Suggested Learning Outcomes

Compare and order the mass of objects.

Use measurement language to describe the comparison of mass.

Find the mass of objects in kilograms.

Independent Tasks

These objects will be put into a parcel to send from the post office.

Can you use the cubes to work out the mass of each parcel?

Mathematical Language

Mass, same, different, heavier, lighter, less mass, more mass, massive, kilogram.

Anticipations

Solutions, Misconceptions

Task 12

Sose is helping her mother buy some fruit at the supermarket. She needs to know the mass of the fruit to work out the cost.

Can you measure the mass of the fruit and record this on a number-line and using grams?

Teacher Notes

During the launch, use scales marked in grams to find the mass of various pieces of fruit. Highlight that g represents grams.

Have analogue scales with measurement markings and different pieces of fruit (or dough to represent fruit)

Facilitate students to understand that a kilogram is a national and international agreed unit (metric standard) for measuring mass and is recorded as kg and that gram is another similarly agreed unit of mass recorded as g.

Note that scales find the weight of an object. This is the force of gravity by which it is attracted to the Earth (gravitational pull). However, because gravity is almost the same everywhere on Earth an object's weight provides a good estimate of its mass.

Talk about finding the mass and not weighing. Use the term more massive or less massive rather than heavier or lighter or so on.

Expect students to compare the mass of different pieces of fruit and then represent this as measurement units on a number line and record this using the unit measurement of grams.

Support the students to count in groups of tens to make a 100 g, or 20s, or 50s to make 100 g or 1000 g, or 100s to make 1000 g. This is a good opportunity to look at the place value of these numbers.

Shareback

Select students to share who have developed number lines which show the measurement units remaining the same and repeated with no gaps. Alternatively model this to students and discuss.

Big Ideas

There are a range of attributes that we can measure including length, mass, time, area, angle, and volume.

When we measure, we use comparison, specifically, we compare like properties to see which is greater. We can make comparisons using standard or non-standard units of measure and we use mathematical language to describe these.

There are key principles related to measurement including that the size of the measurement unit remains the same (including identical units or subdivisions), units are repeated with no gaps or overlaps (iteration), the unit is part of a whole and the measurement is expressed as the total number of units used.

Curriculum Links

During Year 2

Estimate and use an informal unit repeatedly to measure the length, mass (weight), volume or capacity.

Compare and order several objects using informal units of length, mass (weight), volume, or capacity.

Connect

Ask students to use the mass measures of their classmates to order the parcels that have been weighed from greatest mass to least mass. Focus attention on how the measurement units can be combined as tens and ones.

Mathematical Language

Mass, grams, kilogram, same, different, heavier, lighter, less mass, more mass, massive.

Suggested Learning Outcomes

Use units to measure mass on a balance scale.

Compare the mass of an object using grams.

Independent Tasks

Select one or more of the following assessment tasks (attached at the end of the document) as the independent activity:

Assessment 1: Measure the length of lines.

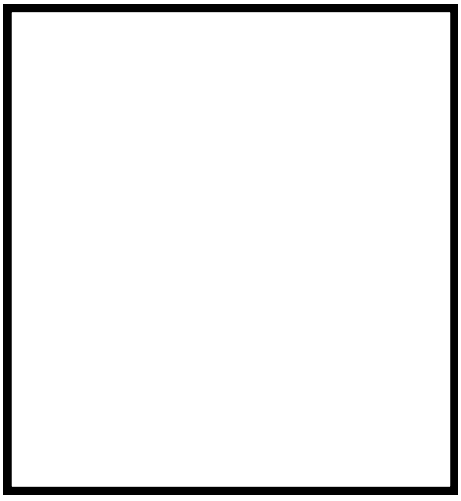
Assessment 2: What box is the biggest?

Anticipations

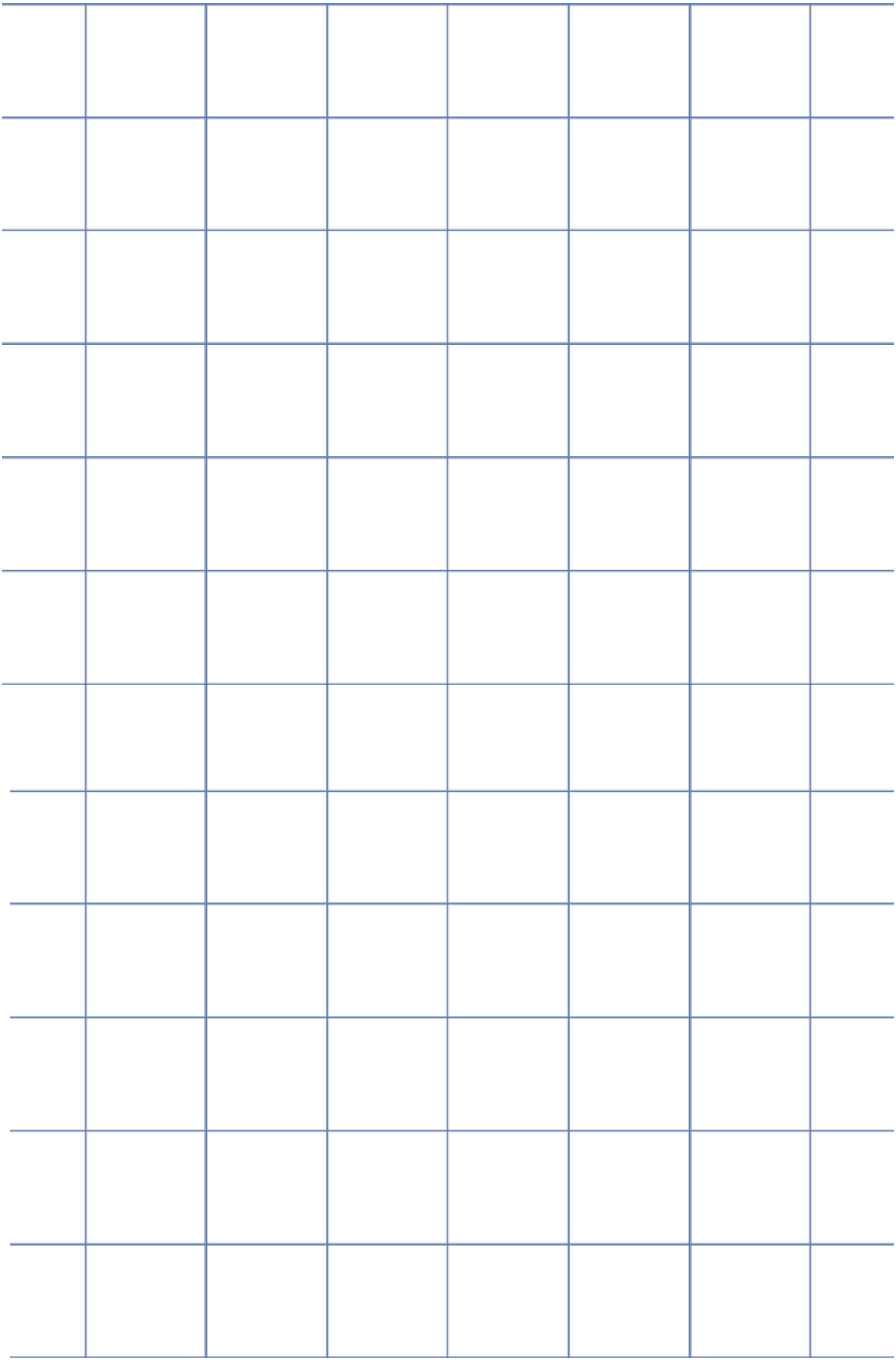
Solutions, Misconceptions

Assessment Task 1 - Year 2

Find the area of each postcard with the squares. Show how you measured each postcard and write the measurement count.



Assessment Task 2 - Year 2

Which one of these boxes is the biggest? Which one is the smallest? Describe how you measured it and how you know.

(Teacher notes: Give students 3 small boxes and centi-cubes or multi-link. Take photos of students' way of measuring)