White Rose Maths

Summer - Block 4

Measurement

Year 2

Overview

Small Steps

- Compare mass
- Measure mass in grams
- Measure mass in kilograms
- Compare volume
- Millilitres
- Litres
- Temperature

NC Objectives

Choose and use appropriate standard units to estimate and measure length/height in any direction (m/cm); mass (kg/g); temperature (°C); capacity (litres/ml) to the nearest appropriate unit, using rulers, scales, thermometers and measuring vessels

Compare and order lengths, mass, volume/capacity and record the results using >, < and =

Compare Mass

Notes and Guidance

Children recap on Year 1 learning by comparing the mass of different objects. They will initially use balance scales to compare the mass of two or more objects.

Children compare mass using < and > and order objects based on their masses.

Mathematical Talk

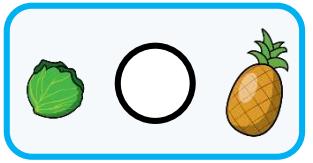
Look at the scale, which side is lower?
What does this tell us about the objects?

Which object is heavier? Which object is lighter?

Can you hold the objects and predict which is heavier?
Is a largest object always the heaviest?

Varied Fluency

- Using the words 'more' and 'less' and the > or < symbols, describe the mass.



The lettuce weighs _____ than the pineapple.

- Choose three objects. Use the balance scales to order them from heaviest to lightest?

The _____ is heavier than the _____ but lighter than the _____.
The _____ is lighter than the _____ but heavier than the _____.

- Complete the sentences:

4 bananas weigh the same as ___ doughnuts.
2 bananas weigh the same as ___ doughnuts

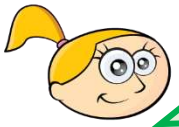
Can you write sentences using 'more' or 'less' using the image?

Compare Mass

Reasoning and Problem Solving

Apples weigh more than bananas.

Tommy



Two doughnuts weigh the same as two bananas.

Eva

Do you agree?
Explain why.

3 bananas weigh the same as two apples, so Tommy is correct - an apple must weigh more than a banana.
1 banana weighs the same as 2 doughnuts so Eva is incorrect.

One pear weighs 10 cubes.
How many cubes will balance one pineapple?
Explain how you know.

1 pineapple weighs 20 cubes.

Always, sometimes or never true?

The larger the box, the heavier it is.

Sometimes. Children can explore this using different sized boxes.

Measure Mass (g)

Notes and Guidance

In Year 2, the children use standard units of mass (grams) for the first time. They continue to use balance scales before moving on to use standard weighing scales.
Children apply their counting in 2s, 5s and 10s skills to reading scales accurately. They should see a variety of scales with different intervals. Give children the opportunity to feel the mass of gram weights so they can use this for estimation.

Mathematical Talk

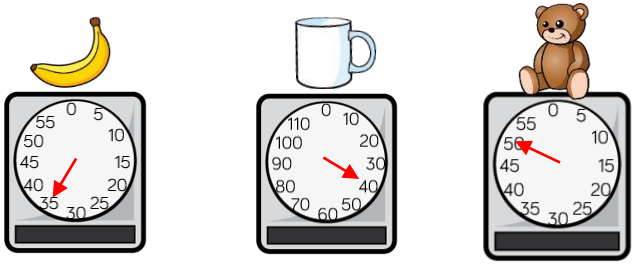
When the balance scales are level, what does this tell us?
What symbol could we use? (=)
What is the mass of the _____?
What would two _____weigh?
How could you tell is something was lighter or heavier than 10g?
How much heavier is the _____ than the _____? How could you work it out?

Varied Fluency

- Use gram weights to measure the mass of objects using a balance scale.

  The _____ weighs _____ grams.

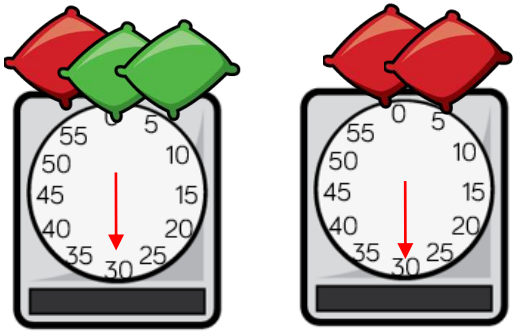
- Use scales to record the mass of objects in grams.



- Order the items from heaviest to lightest.

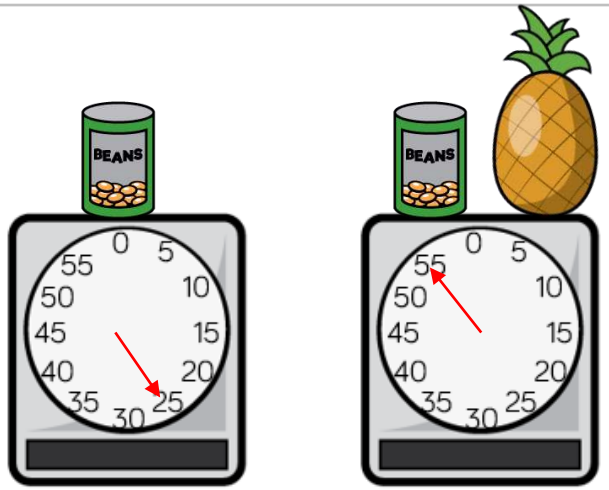
Measure Mass (g)

Reasoning and Problem Solving



Which is heavier, the red or the green beanbag?
Explain why.

The red beanbag weighs more because it weighs the same as **two** green beanbags.



.

The  weighs ☐ g.

The  weighs ☐ g.

The tin of beans weighs 25 g and the pineapple weighs 30 g

Measure Mass (kg)

Notes and Guidance

Children use their knowledge of measuring mass in grams to start to measure mass in kilograms.
They apply counting in 2s, 5s and 10s to measure on different scales.
Give children the opportunity to feel the mass of kilogram weights and real life objects that weigh 1 kg so they can use this to estimate.

Mathematical Talk

Which is heavier, one gram or one kilogram?
What else do you think we might measure in kilograms?

How much do you think that you weigh? Would you measure this in grams or kilograms? Shall we estimate and then weigh ourselves?

Can you make up some different questions about the suitcases? What words can you use to compare?

Varied Fluency

- Find the mass of the sweets and the beans.

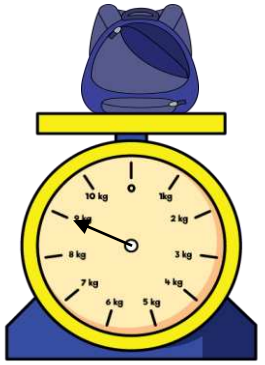
The sweets weigh ____kg

The beans weigh ____g.

- Read the scales to find the mass of each.

The bag weighs ____ kg.

The person weighs ____ kg.



- Sophie's family are going on holiday. Compare the mass of their suitcases.

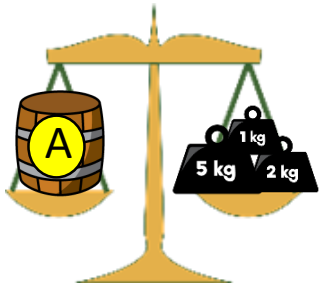
Sophie's suitcase is _____ than Dad's suitcase

Mum's suitcase weighs ____ kg more than Dad's suitcase.

Measure Mass (kg)

Reasoning and Problem Solving

What is the mass of each barrel?



Double the mass of A

Half the mass of A

What is the difference between the mass of B and C?

Barrel A weighs 8 kg

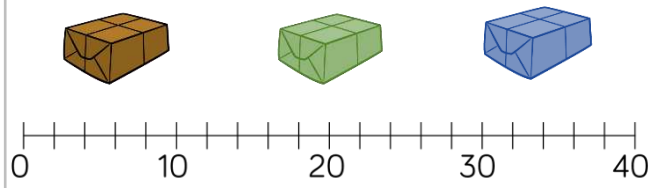
Barrel B weighs 16 kg

Barrel C weighs 4 kg

B is 12 kg heavier than C

The brown parcel weighs twice as much as the blue parcel.
The green parcel weighs 2 kg more than 30 kg
The blue parcel weighs 12 kg less than the green parcel.

Draw an arrow to show where each parcel would be on the scale.



The green parcel weighs 32 kg

The blue parcel weighs 20 kg

The brown parcel weighs 40 kg

Compare Volume

Notes and Guidance

Children compare the volume of containers using $<$, $>$ and $=$
They build on their understanding of the difference between capacity and volume from Year 1. Capacity is the amount a container can hold. Volume is the amount it is actually holding.

Children use the language 'quarter', 'half' and 'three-quarters full' to describe and compare volume. Make sure children have the opportunity to practically investigate volume and capacity.

Mathematical Talk

Which container has the largest/smallest capacity? How do you know? Can we order them from largest to smallest?

Which container has the most or least liquid in?

How many mugs does it take to fill the bottle?
Is this more or less than the pot? Can we find the difference?
Does the tallest container always hold the most?

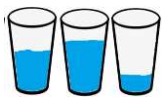
Varied Fluency

- Show three different containers. Which container has the largest capacity? Using water or rice, make each container:
one quarter full, half full, three-quarters full.

- Complete the sentences using the words 'less', 'more' or equal'.

A B

Container A has _____ than container B.

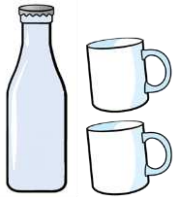


A B C

Container C has _____ than container B.

Container A has _____ than container C but _____ than container B.

- Complete the sentences:



The bottle can fill _____ mugs.

The pot can fill _____ mugs.

Use other containers to investigate how many mugs of rice they take to fill.

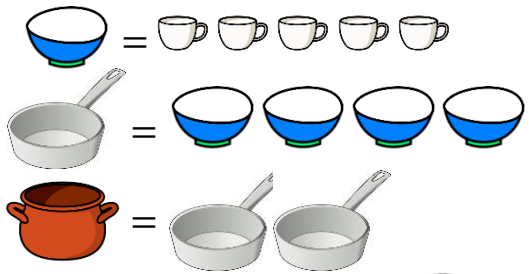
Compare Volume

Reasoning and Problem Solving

Whitney had two full bottles of juice.
She poured some juice into two glasses.

Which glass has the most juice in?
Which has the least juice in?
Explain how you know.

Glass A has the least juice in and Glass B has more juice in. Bottle A has more juice left over which means it has less juice poured out.



How many does the hold?

The pot holds 40 cups of water.

Choose a selection of different sized containers.
Decide how you will measure how much liquid each container can hold.
Order your containers from smallest to largest.
Compare the containers using <, > or =

Millilitres

Notes and Guidance

Children are introduced to standard units of millilitres (ml) for the first time.

They should be provided with a selection of different measuring cylinders and jugs in order to practice measuring in millilitres. They should be encouraged to estimate how many ml unlabeled containers will hold and then use measuring cylinders or jugs to check.

Mathematical Talk

Which container has the largest/smallest capacity? Can we order them from largest to smallest?

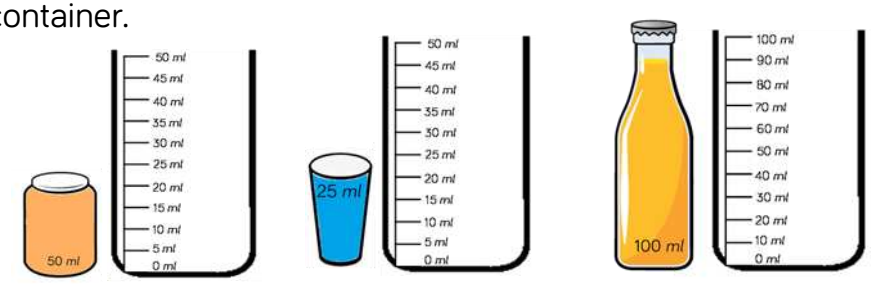
Look at the scale on my cylinder, what do you notice? Is this the same for this cylinder?

If we pour the liquid from this jar/glass into the cylinder, how much does each container hold?

Varied Fluency

- Use a variety of different containers with ml clearly labelled e.g. measuring spoon, water bottle, liquid soap, vinegar etc. Introduce that liquid can be measured in millilitres. Discuss whether 5 ml is a large or small amount. Show 5 ml using a medicine spoon. Look at the containers estimate then identify how many ml each container holds.

- Draw the level on the scale to show the capacity of each container.



The container's capacity is ____ *ml*

The container's capacity is ____ *ml*

The container's capacity is ____ *ml*

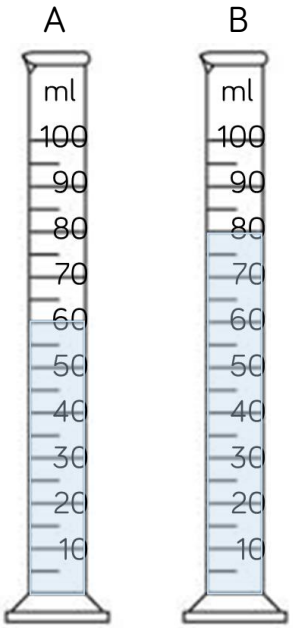
- Use different containers e.g. mug, bowl, pan, tea cup. Fill them with water or rice. Pour them into a measuring cylinder and measure the amount of liquid or rice in the measuring cylinder.

Millilitres

Reasoning and Problem Solving

A  holds 5 ml of liquid.

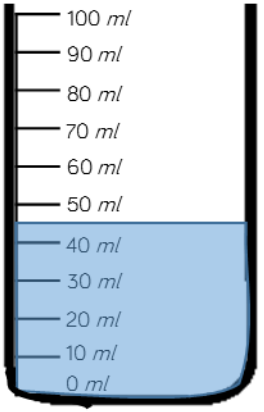
How many  of liquid are there in each container?



Container A holds 12 teaspoons.

Container B holds 16 teaspoons.

Estimate the amount of water in the container.



Explain why you have given your answer.

The water is between 40 ml and 50 ml
It is approximately 45 ml

Litres

Notes and Guidance

Children are introduced to litres (l) as a standard unit for the first time.

Children recognise the difference between measuring in millilitres and litres and when it is more efficient to use litres to measure liquid rather than millilitres. They should be encouraged to estimate volumes and then check by measuring.

Mathematical Talk

Which is larger, 1 mililitre or 1 litre? How do you know?

Would you measure _____ in litres or millilitres? Why?

How many litres of water do you drink a day?

Show the children a litre container. How many litres of water do you think it would take to fill _____?

Varied Fluency

- Provide a variety of different containers with litres clearly labelled e.g. cola bottle, paint bottle, milk etc.

  Introduce litres and discuss how these are the same but different to millilitres. Identify how many litres fill each container.

- Show how much liquid is in each cylinder after you:
  - Pour 3 litres of water into the cylinder.
  - Leave 1 litre of cola in the bottle.
  - Pour half of the juice into the cylinder.

- Use different containers e.g. bucket, large pan etc. Estimate and then measure the capacity of each one.

Litres

Reasoning and Problem Solving

Mo puts 4 litres of water in bucket A.
He then pours 3 litres from bucket A into bucket B.

A B

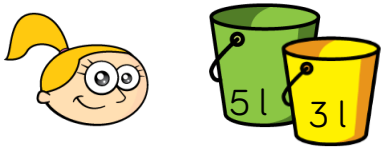
Which sentence is correct?

- There is more in bucket A.
- There is less in bucket A.
- There are equal amounts in each bucket.

Explain why.

There is less in bucket A because there will be 1 litre in A and 3 litres in B.

Eva wants to measure 2 litres of water into a tub. She only has a 5 litre and a 3 litre container.



How can she use both containers to measure 2 litres?

Eva could fill her 5 litre container and then empty 3 litres into the 3l container. She will be left with 2 litres.

5l – 3l = 2l

3 bowls each have more than 20 l of water in but less than 50 l

The green bowl has 5 l more than the red bowl.

The blue bowl has 10 l more than the green bowl.

How much could each bowl have in?

The red bowl could have between 20 l and 35 l

The green bowl could have between 25 l and 40 l

The blue bowl could have between 35 l and 50 l

Temperature

Notes and Guidance

Children are introduced to temperature, thermometers and the units 'degrees Centigrade', written °C for the first time. They learn that the temperature is higher when it is warmer.

They apply their counting in 2s, 5s and 10s skills when reading different scales on thermometers.

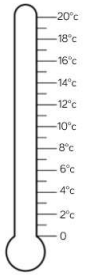
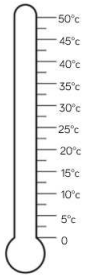
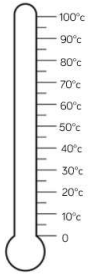
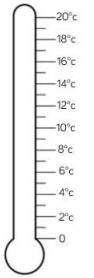
Mathematical Talk

What unit can we use to measure temperature?
What is the scale going up in? How do you know?
If the temperature increases what happens to the number on the scale?
If the temperature decreases what happens to the number on the scale?
Can we compare temperatures using vocabulary such as increased, decreased, warmer, colder and difference?

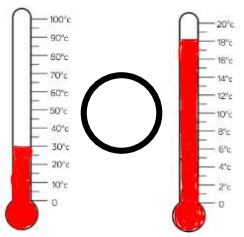
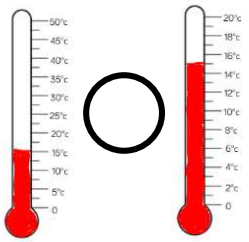
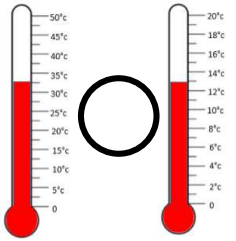
Varied Fluency

- Take temperatures around the school and complete the following stem sentences:
  The temperature in the classroom is _____.
  The classroom is _____ than the playground.
  The difference in temperature between the _____ and the _____ is __ degrees Celsius.

- Complete the thermometers to show the temperatures.


16 °C

35 °C

70 °C

9 °C

- Compare the temperatures using <, > or =

Temperature

Reasoning and Problem Solving

Mollie took the temperature at 12 p.m. and again at 5 p.m.

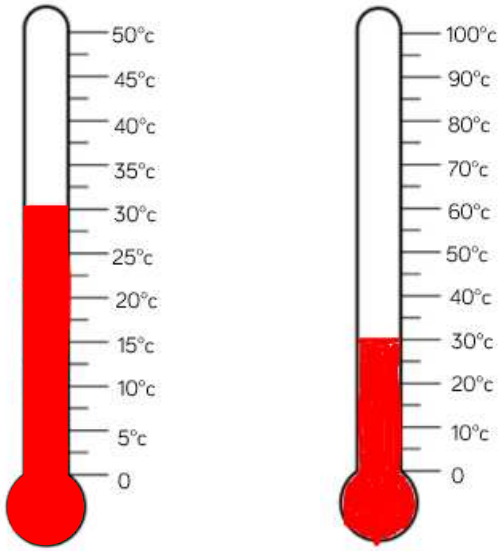
There was a difference of 7°C

What could the temperatures be?

Children may give any temperatures that have a difference of 7

Some children may realise that it is usually cooler in the evening and therefore make sure there 12pm temperature is always warmer than the 5pm temperature.

What is the same and what is different about the thermometers/temperatures?



Both thermometers are showing 30°C

The scale on the first thermometer counts up in 5°c. The scale on the second thermometer counts up in 10°C

The second thermometer will be able to record higher temperatures.