Released April 2018

Year 2

Small Steps Guidance and Examples

Block 4: Measurement

White Rose Maths

Year 2 – Yearly Overview

	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12
Autumn	Number: Place value			Number: Addition and Subtraction					Measurement: Money		Number: Multiplication and Division	
Spring	Number: Multiplication and Division		Statistics		Geometry: Properties of Shape			Number: Fractions			Measurement: length and height	Consolidation
Summer	Position and direction			Problem solving and efficient methods		Measurement: Time		Measurement: Mass, Capacity and Temperature			Investigations	

Week 8 to 10 – Mass, Capacity & Temperature

Overview

Small Steps

- Compare mass
- Measure mass in grams
- Measure mass in kilograms
- Compare capacity
- 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 two objects.

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

Mathematical Talk

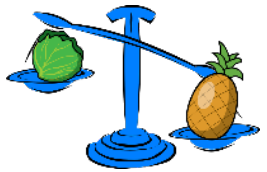
Look at the scale, which side is lower? What does this tell us about the objects?

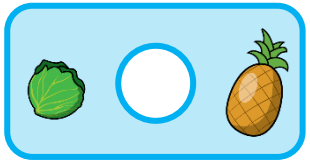
Which object is heavier? Which object is lighter?

Can you predict which object will be heavier?

Varied Fluency

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





The lettuce weighs _____ than the pineapple.

2 Choose three objects. How can you use the balance scales to order them from the heaviest to lightest?

The ☐ is heavier than the ☐ but lighter than ☐

The ☐ is lighter than the ☐ but heavier than ☐

3 Complete the sentences:

☐ bananas are equal to ☐ donuts.

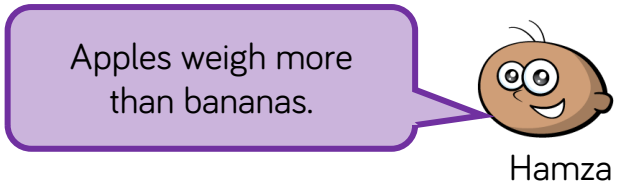
2 bananas are equal to ☐ donuts.

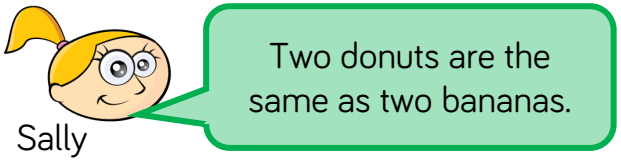
☐ banana is equal to 2 donuts.

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

Compare Mass

Reasoning and Problem Solving





Do you agree?
Explain why.

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

One pear weighs 10 cubes.
How much does one pineapple weigh?
Explain how you know.

1 pineapple weighs 20 cubes.

Always, sometimes, never.

The bigger the box, the heavier it is.

Sometimes.
Children can explore this using different sized boxes.

Measure Mass (g)

Notes and Guidance

In Year 1, children have experienced measuring mass using non-standard units. In Year 2, they will use gram weights and balance scales before moving on to use standard scales.
Children will apply their counting in 2s, 5s and 10s skills to measuring mass in grams.
Give children the opportunity to feel the mass of gram weights so they can use this to estimate.

Mathematical Talk

What does the balance scale being level tell us?
What symbol could we use? (=)

How much heavier is this object? How could you work it out?

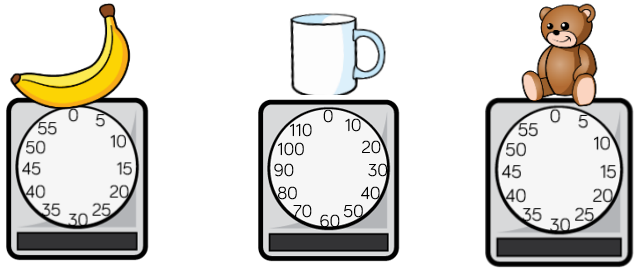
If I add 100 g to the scale, what would the new mass be?

Varied Fluency

1 Using gram weights in multiples of 5 to measure the mass of objects using a balance scale.

The ☐ weighs ☐ grams.

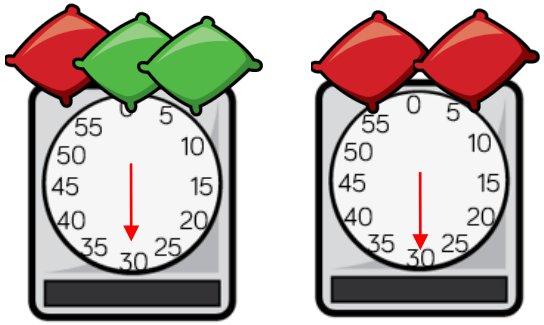
2 Use scales to record the mass of objects in grams.



3 Order the items from heaviest to lightest.

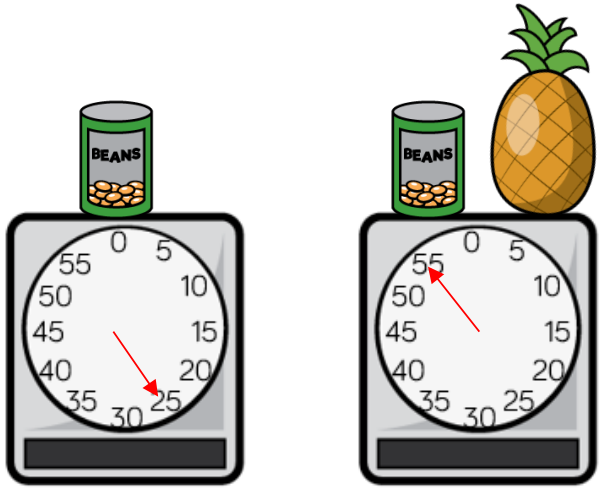
Measure Mass (g)

Reasoning and Problem Solving



Which is heavier, the red or the green beanbag? Give your reasoning.

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 their counting in 2s, 5s and 10s to measuring mass and reading scales in kilograms.
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

How much do you think one tin of beans weigh?
Explain why you think that.

Which is heavier, one gram or one kilogram?

What else do you think we might measure in kilograms?

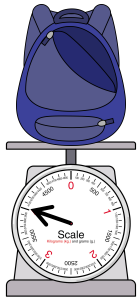
Varied Fluency

1 Find the mass of the sweets and the beans.

The sweets weigh ☐ *kg*

The beans weigh ☐ *kg*

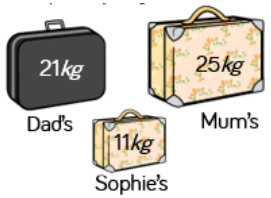
2 Read the scales to find the mass of each.



The bag weighs ☐ *kg*

The person weighs ☐ *kg*

3 Sophie's family are going on holiday. At the airport they weigh their suitcases. Compare the weight of their cases.



Sophie's case ◯ Dad's case

Mum's case weighs ☐ *kg* more than Dad's case.

Measure Mass (kg)

Reasoning and Problem Solving

Which unit would you measure the objects in?
Grams or Kilograms?

A child

A banana

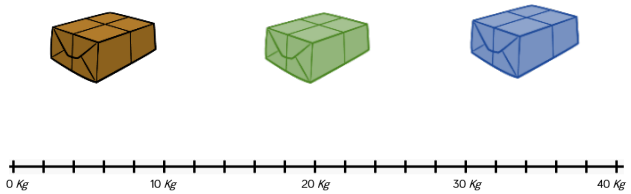
A pencil

A laptop

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

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 Capacity

Notes and Guidance

Children build on their understanding from Year 1 to explore the difference between capacity and volume. They use containers to compare capacity and volume and recognise the capacity is the amount of liquid a container can hold and the volume is how much liquid is in the container.

Children use the language 'quarter', 'half' and 'three quarters full'.

Mathematical Talk

Which container has the largest/smallest capacity? Can we order them from largest to smallest?
Can we show the same volume in each container? Does it look the same? Why?
Which container has the more or less 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?

Varied Fluency

1 Take three different containers. Using water or rice, which container has the largest capacity? Show me each container where the volume is: quarter full, half full and then three quarters full.

2 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.

3 Complete the sentences:

The pot can fill ☐ mugs.

The bottle can fill ☐ mugs.

Which holds more?

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

Compare Capacity

Reasoning and Problem Solving

Steph pours juice from two identical bottles into two identical glasses.

Bottle A

Bottle B

Which glass has the most juice in?
Which has the least juice in?
Explain why.

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.

Choose different sized containers in your classroom. Measure how much liquid each container can hold. Order your containers from which one can hold the most water to the least. Compare the containers using <, > or =

Millilitres

Notes and Guidance

Children are introduced to standard units for the first time. They use measuring containers to measure capacity and volume in millilitres.

Once children are secure in using and understanding millilitres as a standard unit they move on to solve problems involving capacity and volume.

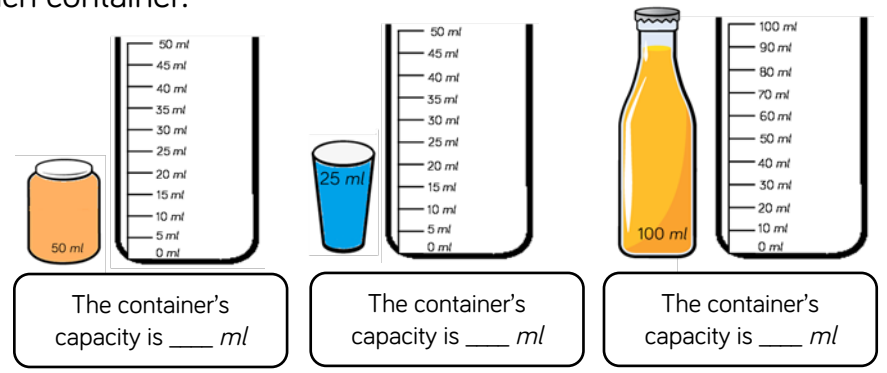
Mathematical Talk

Which container has the largest/smallest capacity? Can we order them from largest to smallest?
Look at the scale on my cylinder, what do we 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?
Can we identify the volume in each cylinder? Which container had more/less liquid in than this?

Varied Fluency

1. 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. Show 5 *ml* using a medicine spoon. Discuss is 5 *ml* a large or small amount? Look at the containers and identify how many *ml* each container holds.

2. Show on the measuring jug where the liquid would go to from each container.



3. 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 volume of liquid or rice in the measuring cylinder.

Millilitres

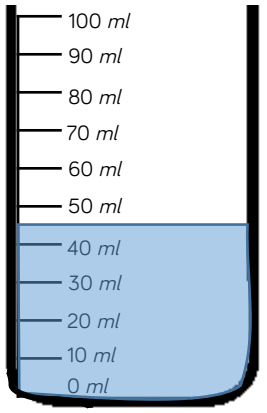
Reasoning and Problem Solving

Gather different sized containers in width and height. Estimate how much is in each container. Record your results in the table:

Container	Estimate	Amount

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.

The water in this container does not reach a line exactly.
What is a good approximation?



Explain why.

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

Litres

Notes and Guidance

Children are introduced to litres as a standard unit for the first time. They use measuring containers to measure capacity and volume in litres.

Children recognise the difference between measuring in millilitres and litres and when you would use litres to measure liquid opposed to millilitres.

Mathematical Talk

Would you measure in litres or millilitres? Why?

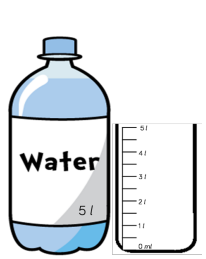
How many litres of water do you think it would take to fill the bath?

How many litres of water do you drink a day?

Varied Fluency

1. Use a variety of different containers with litres clearly labelled e.g. cola bottle, paint bottle, milk etc.
Can we measure these in *ml*?
Introduce litres and discuss how these are the same but different to millilitres. Identify how many litres fill each container.

2. Show the volume of liquid that is in each cylinder.
   - Pour 3 *l* of water into the cylinder.
   - Leave 1 *l* of cola in the bottle.
   - Half of the juice is in the cylinder.



3. Use different containers e.g. bucket, large pan etc.
Estimate the capacity of each one.
Measure the capacity in litres.

Litres

Reasoning and Problem Solving

Jed has a bucket which has 5 *l* of water in. He pours 3 and a half *l* into another bucket. 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 2 and half litres in A but in B there is 3 and half litres.

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 °c for the first time.
They apply their counting in 2s, 5s and 10s skills when reading different 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?
If the temperature decreases what happens to the number?
Can we compare temperatures using vocabulary such as increased, decreased, warmer, colder and difference?

Varied Fluency

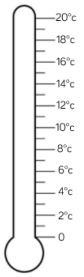
1 Take temperatures around the school and complete the following stem sentences.

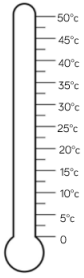
The temperature in the classroom is ☐

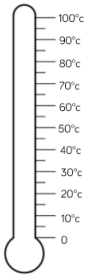
The classroom is ☐ than the playground.

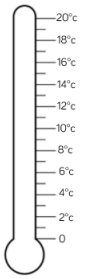
The difference in temperature between the ☐ and the ☐ is ☐ degrees Celsius.

2 Complete the thermometers to show the temperatures.

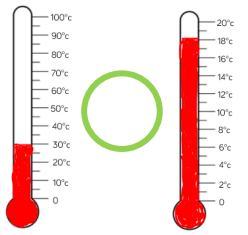

16 °C

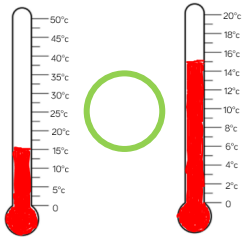

35 °C

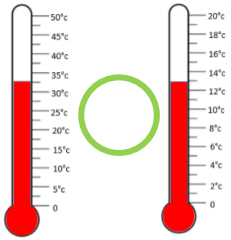

70 °C


9 °C

3 Compare the temperatures using <, > or =







Temperature

Reasoning and Problem Solving

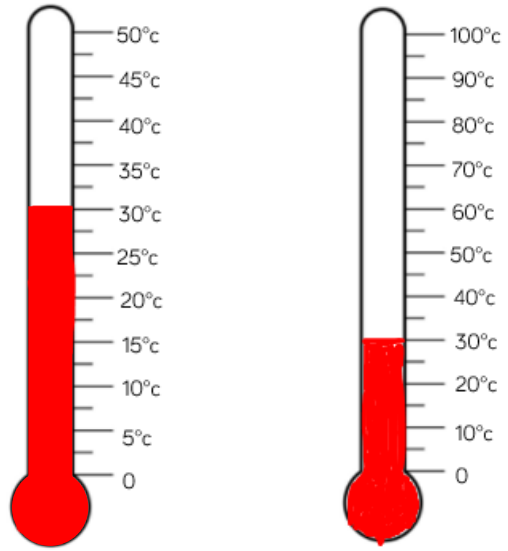
Mollie took the temperature at 12 pm and again at 5 pm
There was a difference of 7°C

What could the temperatures be?

Children may give any temperatures that have a difference of 7

Some children may realise that it starts to get 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 is 5°c. The scale on the second thermometer is 10°C

The liquid in the thermometers shows different heights.