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LEWISHAM
COLLEGE

Topic: A practical approach to the teaching and learning of Metric Measures.

1. Topic outline
2. Worksheets with curriculum reference Numbers.



Resources: Measuring equipment

A variety of empty containers to measure capacity.

A variety of everyday items to weigh.

A range of different packaging and containers.

Access to water.

The introductory sessions

Aim: To become familiar with the names and use of measuring equipment.

To introduce the vocabulary and some grammar of measurement.

Measuring equipment :

Time - analogue and digital clocks and watches, egg timer

Temperature - room thermometer, clinical thermometer, fridge thermometer

Money - notes and coins

Linear - rulers (30cm and metre rule), metal and fabric/plastic tape measures, trundle wheel, height measure, dividers and callipers.

Mass - balance scales and weights, personal scales, kitchen scales, measuring cups and spoons

Capacity - measuring jugs, cylinders, funnels, medicine spoon and cup

Angles - protractor

Containers: carton, can, tube, packets, flask, jar, jug, bottle, sachet, sack, tin, barrel, tub, vat, box, punnet, bowl

Vocabulary: measure, long, tall, high, height, length, width, depth, breadth, mass, weigh, weight, heavy, light, capacity, volume, boiling, freezing, mild, tepid, warm, moderate, cool, units of measurement

Activities: Matching flash cards to equipment and containers (whole class and pair work)

Labelling pictures of equipment and containers.

Alphabetical order exercises - equipment

- containers

Matching (English) definitions with the names of equipment

Match English names with own language names.

Making sentences using the vocabulary. (Writing and speaking)

Making questions using the vocabulary. (Writing and speaking)

NB. Please note that in Worksheets 6, 7, 8 & 9, the exercises are carried out using rooms at Lewisham College. Please amend the worksheet to suite your requirements.



Metric Measures- The units

Linear (length)

1000 millimetres in 1 metre

$$1000\text{mm} = 1\text{m}$$

$$10\text{mm} = 1\text{cm}$$

100 centimetres in 1 metre

$$100\text{cm} = 1\text{m}$$

1000 metres in 1 Kilometre

$$1000\text{m} = 1\text{Km}$$

Capacity (liquids/gases)

1000 millilitres in a litre

$$1000\text{ml} = 1\text{ l}$$

$$10\text{ml} = 1\text{cl}$$

100 centilitres in 1 litre

$$100\text{cl} = 1\text{ l}$$

Mass/weight

1000 milligrams in 1 gram

$$1000\text{mg} = 1\text{ g}$$

1000 grams in 1 Kilogram

$$1000\text{g} = 1\text{ Kg}$$

1000 Kilograms in 1 tonne

$$1000\text{Kg} = 1\text{ tonne}$$



The language of metric measures

milli (thousandth part) Ψ **milli**metre (mm) 1000 in a metre
millilitre (ml) 1000 in a litre
milligram (mg) 1000 in a gram

cent (hundredth part) Ψ **centi**metre (cm) 100 in a metre
centilitre (cl) 100 in a litre

Kilo (1000 of) Ψ **Kilo**metre (Km) 1000 of metres
Kilogram (Kg) 1000 of grams



Measurement - linear

Task: To check the correct use of a 30cm ruler.

Use a metric ruler to measure the following items:

1. Your Maths folder

How long is your folder in mm? _____

How long is your folder in cm? _____

How wide is your folder in mm? _____

How wide is your folder in cm? _____

What is the difference, in mm, between the length and the width of your folder?

2. Your desk top

How long is the desk top in cm? _____

How wide is the desk top in cm? _____

What is the difference, in cm, between these two measurements?

3. Your pen/pencil

How long is your pen in mm? _____

How long is your pen in cm? _____

4. Your dictionary

What is the length of your dictionary in cm? _____

What is the width of your dictionary in cm? _____

Which measurement is longer, the length or the width?



5. Your vocabulary book

What is the length of your vocabulary book in mm? _____

What is the width of your vocabulary book in mm? _____

Which measurement is shorter and by how many mm is it shorter?

6. Your hand span

Place the hand you do not use for writing on the next page.

Spread your fingers as wide as you can.

Draw around your fingers including your wrist.

Use a ruler to measure, **in cm**, from the tip of your longest finger to your wrist _____

Measure, **in cm**, from the tip of your thumb to the tip of your little finger (your hand span) _____

What is the difference in the lengths? _____

What is the length of your hand span to the nearest 10 cm? _____

Compare your span with the person sitting next to you.

Is your span wider or narrower than hers/his? _____

Place your hand and measure:

Measurement - Linear

Task: To find out, by measuring, the tallest and shortest student, the tallest and shortest female and male student, the range of heights, the mean average height of the group and the average male and female student heights.

1. Use the height measure to find the height of every student. Ask each student, in turn, to
 - a) take off his/her shoes
 - b) stand on the foot-plate with heels against the upright
 - c) stand up straight with head levelNow move the pointer until it touches the top of the person's head and then ask the person to step off the foot-plate.
2. Write down the name of the student on the chart.
3. Now measure the student's height using centimetres.
4. Record (write down) the height on the chart/table in centimetres, metres and centimetres, and metres.
5. Now use your chart to answer the following questions. Answer on a separate sheet, in a complete sentence.
 - i. Who is the tallest person in the group?
 - ii. Who is the tallest male and who is the tallest female?
 - iii. Who is the shortest person?
 - iv. Who is the shortest male and who is the shortest female?
 - v. What is the difference in heights between the tallest and the shortest person? This is called **The Range** in heights.



- vi. What is the difference in height between the tallest and the shortest male? (The range of male student heights)
- vii. What is the range of female student heights?
- viii. Do any students share the same height?
- ix. What is the mean average height of the group?
- x. What is the mean average height of the male students?
- xi. What is the mean average height of the female students?
- xii. Is any student the mean average height?



Measurement - Linear

Task: To find out, by measuring, the longest and shortest lengths; the circumference, of the heads of students in SLA, the range of lengths of the group, and of male and female students, and, the mean average length of the group, and of male and female students.

1. Use a cloth/plastic tape measure to measure around each student's head. Measure in centimetres and millimetres.
2. Write down the name of the student on the chart.
3. Record (write down) the measurements on the chart.
4. Now use your chart to answer the following questions.
Answer on a separate sheet and use complete sentences:
 - a) What is the longest head measurement?
 - b) What is the shortest head measurement?
 - c) The difference between the longest and the shortest lengths is called **the Range**. What is the range of the head measurements?
 - d) What are the longest and shortest male head measurements?
 - e) What is the range of male head measurements?
 - f) What are the longest and shortest female head measurements?
 - g) What is the range of female head measurements?
 - h) What is the mean average head measurement of the group?
 - i) What is the mean average head measurement of the male



- j) What is the mean average head measurement of the female students?
- k) What is the difference between the mean average of the male students and female students?
- l) Does any student have the mean average head measurement?



Measurement - linear

Task: To find out, by measuring, the dimensions of the floor, the white boards, the windows, and the door and its frame of room 106 at Lewisham College. To calculate the maximum number of whiteboards that could be fitted on the longest wall, to calculate the perimeter and area of the floor, and find out if the door is the average size for doors in Tressillian Building (at Lewisham College).

1. Use a metal tape measure to measure in metres and centimetres the following parts of room 106. Record (write down) the measurements in the chart below.
 - a) the length and width of the floor.
 - b) the length and width of a whiteboard.
 - c) the height and width of the bottom half of a window.
 - d) the height and width of the doorframe of the room
 And measure the height and width of the doors of rooms 106, 222, 150 and 40.

Part of room	length m	cm	m	width m	cm	m

2. Now answer the following questions. Use a separate sheet and use complete sentences.

- a) How long, in metres and centimetres, is the room?
- b) How wide, in metres and centimetres, is the room?
- c) What is the difference in metres between the length and width of the floor?
- d) How long is the perimeter of the floor in m cm?
- e) What is the area of the floor in m^2 ?
- f) How high is a whole window in m cm?
- g) How wide is a window in m?
- h) What is the total area of both windows in m^2 ?
- i) How long is a whiteboard in m?
- j) How many whiteboards could fit on the longest wall?
- k) What is the total area of the two whiteboards in m^2 ?
- l) Is the door an average size door for Tressillian Building?



Measurement - linear

Task: To find out by measuring how much the Café has increased in size.

1. Use a metre stick to measure, in metres and centimetres, the width of the café.
2. Record (write down) the measurement in the table below.
3. Use the metre stick to measure, in metres and centimetres, the old length of the Café.
4. Record the measurement in the table.
5. Measure, in m cm, the new length of the Café.
6. Record the measurement in the table.

Dimension of Cafe	metres	centimetres	m

Now use these measurements to answer the following questions. Use a separate sheet and use complete sentences.

1. What were the dimensions, length and width, of the original Café?
2. How long is the new Café?
3. What is the difference between the new and the old lengths of the Café?
4. What was the perimeter of the original Café?

5. How much, in m cm, has the perimeter increased?
6. Calculate the area of the original Café in m^2 ?
7. Calculate the area of the new Café in m^2 .
8. How much has the area of the Café increased, in m^2 .



Measurement - linear

Task: To find out, by measuring, which one of Tressillian Building corridors is the longest.

The trundle wheel: Make sure the arrow on the wheel is lined up with the start position. Put the wheel on the ground and move forward pushing the wheel. Each click is a metre. Count the clicks

1. Use the trundle wheel to measure, in metres, the full length of the basement corridor.
2. Record (write down) the measurement in the table below.
3. Use the trundle wheel to measure the full length of the ground floor corridor.
4. Record the measurement in the table.
5. Start outside room 106 and measure the full length of the first floor corridor.
6. Record the measurement in the table.
7. Measure the full length of the second floor corridor and record the length in the table.

Floor	Length in metres

Now use these measurements to answer the following questions.
Use a separate sheet and complete sentences.

- a) Which corridor is the shortest and how long is it?
- b) Which corridor is the longest and how long is it?
- c) How much longer is the longest than the shortest?
- d) Are any of the corridors the same length?
- e) If the answer is yes, which corridors are the same length and how long are they?
- f) If the answer is no, how long is the second shortest and how long is the second longest?
- g) What is the difference in the lengths?
- h) Write the lengths of all the corridors in order, shortest to longest.
- i) Calculate the mean average length of the corridors.



Measurement - linear

Task: To find out, by measuring, the dimensions of the furniture and fittings in room 106.

1. Use a metal tape-measure to measure, in cm mm, the length, width and height of one student desk and the teacher's desk.
2. Record (write down) the measurements in the table.
3. Use the metal tape-measure to measure, in cm mm, the length, width and height of the small cupboard.
4. Record the measurements in the table.
5. Use the metal tape-measure to measure, in cm mm, the length, width and height of one filing cabinet.
6. Record the measurements in the table.
7. Use the metal tape-measure to measure, in cm mm, the length, width and height of one of the large cabinets.
8. Record the measurements in the table.
9. Use the metal tape-measure to measure, in cm mm, the length, width and height of the sink unit.

Item of furniture	length cm mm	length m	width cm mm	width m	height cm mm	height m

Now use the measurements in the table to answer the following questions. Use a separate sheet and use complete sentences.

1. What are the measurements, in metres, of the student's desk and the teacher's desk?
2. What is the difference, in metres, between the lengths of these desks?
3. What is the difference, in cm mm, between the widths of the desks?
4. Are the heights of the desks the same measurement or different?
5. How long, in metres, is a filing cabinet?
6. What is the total length, in m, of the three filing cabinets?
7. What is the perimeter, in m, of the three filing cabinets?
8. How tall, in metres, are the big cabinets?
9. How much taller, in m, than the sink unit are the big cabinets?
10. What is the total length, in m, of the two cabinets
11. Which is wider and by how much, in m, the sink unit or the big cabinet?
12. Is the sink unit longer or shorter than the small cupboard?
13. Which is longer the small cupboard or two filing cabinets?
14. Is the small cupboard as wide and as long as a big cabinet?



Measurement - Mass

Task: To become more familiar with the use of the metric units mg, g and Kg.

- Sort all of the items on your table into groups of the same container.
- Complete the following chart:

Product (item)	Type of container	Contents in mg, g, Kg
Crisps	Packet	grams

Measurement - mass

Task: To find, by weighing, the mean average weight of some fruits and vegetables and predict the number of each in a Kilogram.

Each piece of fruit and vegetable is labelled with a letter.

1. Use metric units, grams, to weigh potato A and record the weight on the chart.
2. Using the same units weigh potato B and record its weight.
3. Weigh potato C and record its weight.
4. Weigh potato D and record its weight.
5. Use grams to weigh the carrots E, F and G and record the weights on the chart.
6. Use grams to weigh each onion, H, I, J and K and record the weights.
7. Weigh the banana L, in grams, and record its weight on the chart.
8. Use the same units to weigh the lime M, and record its weight.
9. Use grams to weigh the Satsuma N and record its weight on the chart.
10. Weigh the lemon O, in grams, and record its weight.
11. Weigh the apple P, in grams, and record its weight.



Now use the weights in the chart to answer the following questions. Use a separate sheet and use complete sentences.

1. Which potato weighs the most?
2. Which potato weighs the least?
3. Put the potatoes in order of the weights, lightest to heaviest.
4. What is the total weight, in grams, of the potatoes?
5. Calculate the mean average weight of these potatoes.
6. Use this average to predict how many potatoes there might be in 1 Kilogram of potatoes.
7. Which carrot is the heavier?
8. What is the difference in weight between the carrots?
9. What is the average weight of the carrots?
10. Use this to predict how many carrots there might be in 1 Kilogram.
11. Which onion is the lightest?
12. What is the difference, in grams, between the heaviest and the lightest onion?
13. What is the total weight, in Kg, of all the onions?
14. Calculate the mean average weight, in g, of the onions?
15. Predict how many onions there might be in 1 Kg.
16. Which citrus fruit weighs the most?
17. Predict how many bananas there might be in 2Kg.
18. Predict how many apples there might be in half a Kilogram.



Measurement - Mass

Task: To find out by measuring the weight of different items. To become more familiar with the units of mass by using weighing scales to find the weight of the items.

You will find many items on the desk. Each item has a different label.

1. Use the weighing scales to weigh, in grams, all the items on the table.
2. Record the letter of each item in the chart and the weight, in grams, of each item
3. Change the grams into Kilograms and record your answer on the chart.



Now answer the following questions. Use a separate sheet and answer in complete sentences.

1. Put all the weights in order, lightest to heaviest.
2. What is the total weight of the 3 lightest weights?
3. What is the difference between the heaviest and lightest weight? This is called **The Range**.
4. What is the mean average weight of all the items?
5. Which item is nearest to the average weight?
6. Are there any items that share the same weight?



Measurement - capacity

Task: To become more familiar with the use of metric units, ml by estimating and measuring the capacity of a variety of different size containers.

There are lots of empty containers on your table.
Each container has a different label.

1. Choose a container and write its letter on your chart.
2. Estimate how many millimetres, it might contain.
3. Record your estimation on the chart.
4. Fill the container with water. Empty the water into a measuring jug or cup or cylinder and measure, using millilitres, the amount of water it contains (its capacity)
5. Record the measurement on the chart.
6. Calculate the difference between your estimate and the actual contents.
7. Continue to find and record the capacity of all the containers.



Use the chart to help you to answer the following questions.
Use a separate sheet and use complete sentences.

1. How good are you at estimating?
2. How many containers have you estimated correctly?
3. Which container held the least amount of water?
4. Which container had the greatest capacity?
5. What is the difference between the least and greatest capacity?
6. Change the capacity of each container from millilitres (ml) to centilitres (cl).
7. Change the centilitres (cl) to litres (l).

