24 MEASUREMENT: SCALES AND UNITS

LEARNING OBJECTIVES

- To use, read, write and convert between standard units of length, weight, volume and time
- To convert between miles and kilometres
- To understand and use approximate equivalences between metric units and common imperial units
- To read scales accurately

CONTENT DOMAINS

- M2 estimate, measure and read scales
- M5 convert between metric units
- M6 convert metric/imperial

STARTER ACTIVITY

- **Measurement knowledge; 5 minutes; page 156**
  Explain that students need to learn some key pieces of information, such as the number of centimetres in a metre.
  The student fills in the gaps on the sheet, then keeps it for reference and to learn the key information.

MAIN ACTIVITIES

- **Converting between units; 10 minutes; page 156**
  See the bottom of the starter activity sheet. Ask the student to convert the measures to the units at the top of the column. They can use the conversions at the top of the activity sheet to help them.
- **Reading scales; 15 minutes; page 157**
  Refer to the prompt to remind the student about reading scales and identifying what each interval is worth. Challenge the student to identify the number indicated by the arrow on each scale.
- **Imperial units; 15 minutes; page 158**
  Check the student understands what imperial and metric units are (see glossary) and then refer to the prompt on the activity sheet together. Check the student understands how to calculate by using a conversion factor. When the student is confident they understand the conversions, they can answer the questions.

PLENARY ACTIVITY

- **Scales; 5 minutes**
  Show the student a variety of scales (tape measure, ruler, thermometer, kitchen scales) and ask them to identify what the divisions are worth on them. Point to a place on the scale and ask the student to say what number you are pointing at. Explain to the student that there are scales all around us and that it is important to be able to read and understand them (such as the speedometer in a car).

HOMEWORK ACTIVITY

- **Scales and units; 20 minutes; page 159**
  Full instructions are given on the sheet.

DIFFERENTIATION AND EXTENSION IDEAS

- **Converting between units** Support by starting with simpler conversions such as 200 cm to metres so that the student can clearly see the link between the different measurements.
- **Reading scales** If possible, support by showing the student a set of kitchen scales (not digital). Discuss the scale and then ask the student to read the weights of different items.
- **Imperial units** Extend by asking the student to cover the table at the top of the sheet before answering the questions.

PROGRESS AND OBSERVATIONS

MATHS
— YEAR 6 —

TUTORS GUILD

STARTER ACTIVITY: MEASUREMENT KNOWLEDGE   TIMING: 5 MINS

LEARNING OBJECTIVES

- To use, read, write and convert between standard units of length, weight, volume and time

EQUIPMENT

Fill in the gaps by converting the measurements.

1 cm = ... mm   .... cm = 1 m   1,000 m = ... km

.... g = 1 kg   1,000 ml = ... litre

MAIN ACTIVITY: CONVERTING BETWEEN UNITS   TIMING: 10 MINS

LEARNING OBJECTIVES

- To use, read, write and convert between standard units of length, weight, volume and time

EQUIPMENT

convert to ml	convert to m	convert to km	convert to kg
1.568 litres =	765 cm =	789 m =	568 g =
0.789 litres =	89 cm =	2,097 m =	8,076 g =
3.789 litres =	112 cm =	13,789 m =	875 g =
8.005 litres =	1.97 km =	62 m =	2,387 g =
10.056 litres =	9.78 km =	7,089 m =	5,001 g =

MAIN ACTIVITY: READING SCALES　　　　**TIMING: 15 MINS**

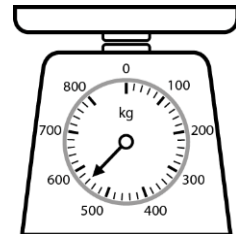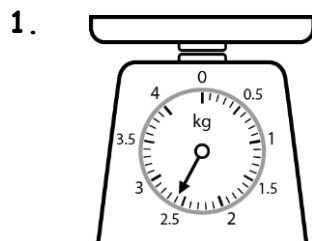| LEARNING OBJECTIVES	EQUIPMENT
• To read scales accurately	none

There are lots of different types of measuring equipment, all using different scales. To read a scale, you need to work out what each interval is worth.

Example:
There are 5 intervals between 700 g and 800 g, so each interval is worth one-fifth of 100 g, or 20 g.

Look at each scale and write what each interval is worth. Then look at where the arrow is pointing and write down the amount it is showing.
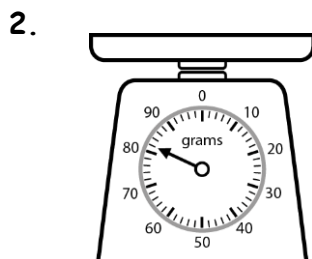
1.

Each interval is worth ....

The scale reads ....

2.

Each interval is worth ....

The scale reads ....

3.

Each interval is worth ....

The scale reads ....

MATHS
— YEAR 6 —

TUTORS GUILD

MAIN ACTIVITY: IMPERIAL UNITS

TIMING: 15 MINS

LEARNING OBJECTIVES
- To convert between miles and kilometres
- To understand and use approximate equivalences between metric units and common imperial units

EQUIPMENT
none

It is important to learn the links between metric and imperial units so that you can make rough conversions between them.

measurement	imperial to metric
length	1 mile ≈ 1.6 km
	1 inch ≈ 2.5 cm
weight	1 pound ≈ 400 g
	1 ounce ≈ 30 g
	2.2 pounds ≈ 1 kg
capacity	1 pint ≈ 500 ml

Use the table to help you answer these questions.

1. How many kilometres are there in 3 miles?   ....

2. Convert 120 g into ounces.   ....

3. How many ml are there in 4.5 pints?   ....

4. How many pounds are there in 7 kg?   ....

5. Convert 11 pounds into kilograms.   ....

6. How many inches are there in 15 cm?   ....

7. How many miles are there in 14.4 km?   ....

8. How many ounces is 75 grams?   ....

9. Convert 4,800 g into pounds.   ....

MATHS
— YEAR 6 —

HOMEWORK ACTIVITY: SCALES AND UNITS   TIMING: 20 MINS

LEARNING OBJECTIVES

- To use, read, write and convert between standard units of length, weight, volume and time
- To convert between miles and kilometres
- To understand and use approximate equivalences between metric units and common imperial units

EQUIPMENT

Answer the questions by converting between units.

You may need to use some of your activity sheets from the session with your tutor to help you remember the conversions.

1. Convert 6.898 litres into millilitres.   ....

2. Write 506 g in kilograms.   ....

3. Write 789 cm in metres.   ....

4. How many centimetres is 780 mm?   ....

5. How many miles are there in 25.6 km?   ....

6. How many kilometres are there in 25 miles?   ....

7. How many inches are there in 45 cm?   ....

8. How many ounces are there in 480 g?   ....

9. How many pints is 4,250 ml?   ....

10. How many pounds are there in 12.5 kg?   ....

24 ANSWERS

STARTER ACTIVITY: MEASUREMENT KNOWLEDGE

1 cm = 10 mm   100 cm = 1 m   1,000 m = 1 km   1,000 g = 1 kg   1,000 ml = 1 litre

MAIN ACTIVITY: CONVERTING BETWEEN UNITS

convert to ml	convert to m	convert to km	convert to kg
1.568 litres = 1,568 ml	765 cm = 7.65 m	789 m = 0.789 km	568 g = 0.568 kg
0.789 litres = 789 ml	89 cm = 0.89 m	2,097 m = 2.097 km	8,076 g = 8.076 kg
3.789 litres = 3,789 ml	112 cm = 1.12 m	13,789 m = 13.789 km	875 g = 0.875 kg
8.005 litres = 8,005 ml	1.97 km = 1,970 m	62 m = 0.062 km	2,387 g = 2.387 kg
10.056 litres = 10,056 ml	9.78 km = 9,780 m	7,089 m = 7.089 km	5,001g = 5.001 kg

MAIN ACTIVITY: READING SCALES

1. 100 g or 0.1 kg; 2,600 g or 2.6 kg
2. 2 g; 82 g
3. 1 mm or 0.1 cm; 233 mm or 23.3 cm

MAIN ACTIVITY: IMPERIAL UNITS

1. 4.8 km   2. 4 ounces   3. 2,250 ml   4. 15.4 pounds   5. 5 kg
6. 6 inches   7. 9 miles   8. 2.5 ounces   9. 12 pounds

HOMEWORK ACTIVITY: SCALES AND UNITS

1. 6,898 ml   2. 0.506 kg   3. 7.89 m   4. 78 cm   5. 16 miles
6. 40 km   7. 18 inches   8. 16 ounces   9. 8.5 pints   10. 27.5 pounds

GLOSSARY

Imperial units
A system of weights and measures, originally based mostly on parts of the human body. It includes inches, feet, yards, pounds, ounces.

Metric units
A modern system of weights and measures based on official standard units and powers of 10. It includes centimetres, metres, grams, kilograms, millilitres, litres.