Monyetla Bursary Project

Grade 11

Lesson 2: Measurement

1. Measuring length and distance:

- **Length –** the measurement or extent of something from end to end
- **Distance –** the length of space between two points
- Units of measurement – millimetre (mm), centimetre (cm), metre (m), kilometre (km)
- Distance = speed x time
- Can use estimation: 1 large step ≈ 1 m;
- from the tip of your nose to the tip of your outstretched arm ≈ 1 m
- Accurate measurements – use measuring instruments such as a ruler, tape measure, odometer, trundle wheel

1 Km = 1 000 m; 1 m = 100 cm; 1 cm = 10 mm

2. Measuring weight (mass):

- Mass is the amount of matter in an object or how 'heavy' something is
- The main units: milligram (mg), gram (g), kilogram (kg) and ton (t)
- Body Mass Index (BMI) – a measure of body weight, based on a person's weight and height

$$\mathbf{BMI} = \frac{\mathbf{mass\ (kg)}}{(\mathbf{height\ (m)})^2}$$

- BMI is used to classify a person's weight status

BMI	Classification
<18,5	Underweight
≥ 18,5 and < 25	Normal
≥ 25 and < 30	Overweight
≥ 30	Obese

1 ton = 1 000 kg; 1 kg = 1 000 g; 1 g = 1 000 mg

3. Measuring volume:

- Volume – the three-dimensional space occupied by a gas, a liquid or a solid substance
- Capacity – the amount of space inside a container
- Units for liquid volumes – millilitres (mℓ), litres (ℓ), kilolitres (kℓ)
- Units for solid volumes – cubic millimetres (mm^3), cubic centimetres (cm^3), cubic metres (m^3)
- 1 teaspoon = 5 ml
- 1 table spoon = 15 ml
- 1 cup = 250 ml
- 1 ml = 1 cm^3
- 1 ℓ = 1 000 cm^3

4. Calculating Perimeter:

- Perimeter – the length of the outside boundary of a shape
- Circumference – the length of the outside boundary of a circle
- Diameter – the length across the middle of a circle from one side to the other, going through the centre
- Radius – the length from the centre of a circle to the outside edge, i.e. half the length of the diameter

5. Calculating Area and Surface Area:

- **Area –** the surface covered by a 2D shape
- **Surface area –** the area of the outer surfaces of a solid (3D) shape

6. Calculating volume:

- **Volume** – a measurement of the space taken up by solids or liquids
- **Capacity** – a measurement of the amount of substance a hollow object can hold

- **When you need to pack items into a container**:

  Length of container ÷ length of object - round answer down to whole number

  Breadth of container ÷ breadth of object - round answer down to whole number

  Height of container ÷ height of object - round answer down to whole number

  Total = answer from length x answer from breadth x answer from height