SHARP

Worksheet 8: Measurement

Grade 11 Mathematical Literacy

1. Convert each of the following values to the units given in brackets:

    a)   150mm (cm)   b)   1 500 000 mm (km)

    c)   1 500 g (kg)   d)   1 569 kg (ton)

    e)   1 500 000 g (ton)   f)   549 cm (m)

    g)   2 300 ml *(l)*   h)   10mm (m)

    i)   20 ml *(l)*   j)   239 g (kg)

    k)   2km (m)   l)   3.5 l (ml)

    m)   20 kg (g)   n)   3,45 m (mm)

    o)   45 *l* (ml)   p)   1 ton (g)

    q)   39 cm (mm)   r)   100 *l* (ml)

    s)   0.5 kg (g)   t)   2,5 km (cm)

2. Convert each of the following values to the units given in brackets:

    a)   120 seconds (minutes)   b)   2700 minutes (hours)

    c)   144 hours (days)   d)   3 days (hours)

    e)   4,5 hours (minutes)   f)   39 minutes (seconds)

    g)   32 400 seconds (hours)   h)   7 200 minutes (days)

    i)   2 days (seconds)   j)   7 days, and 6 hours (minutes)

3.   Convert the following measurements into ml. Remember that 1 tsp = 5ml;

1 Tbs = 15ml, and 1 cup = 250ml

a)	3 tsp	b)	3 Tbs	c)	3 cups
d)	$2\frac{1}{2}$ tsp	e)	$2\frac{1}{2}$ Tbs	f)	$2\frac{1}{2}$ cups
g)	$1\frac{1}{3}$ tsp	h)	$1\frac{1}{3}$ Tbs	i)	$1\frac{1}{3}$ cups

4.   Using the information given below, convert each of the values into the units given in brackets.

1 foot = 0.3048 m   1 inch = 2.54 cm

1 mile = 1.6 km   1 oz = 28.35 g

1 lb = 0.4536 kg

a)	3 ft (m)	b)	25 in (cm)	c)	25 miles (km)
d)	28 oz (g)	e)	3 lb (kg)	f)	3.6 m (ft)
g)	200 cm (in)	h)	32 km (miles)	i)	400 g (oz)
j)	5kg (lb)	k)	6 ft and 9 in (m)	l)	2lb, and 25 oz (g)

5.   Using the information given below, convert each of the values into the units given in brackets.

$1 \text{ mm}^3 = 0.001$ ml $1 \text{ cm}^3 = 1$ ml

$1 \text{ m}^3 = 1\ 000$ liters = 1 kl

a)	4 cm^3 (ml)	b)	10 mm^3 (ml)	c)	50 m^3 (kl)
d)	250 mm^3 (ml)	e)	400 cm^3 (ml)	f)	$0,6 \text{ m}^3$ (l)
g)	10 ml (mm^3)	h)	10 ml (cm^3)	i)	4 kl (m^3)
j)	500 ml (mm^3)	k)	150ml (cm^3)	l)	0.75 kl (m^3)

6.   Convert the following areas into the units given in brackets.

Remember 1 m = 100 cm so 1m² = (100 x 100) = 10 000 cm²

a)   5 m² (cm²)   b)   1,5 m² (cm²)   c)   0,3 m² (cm²)

d)   500 cm² (m²)   e)   1 700 cm² (m²)   f)   50 000 cm² (m²)

7.   Convert the following temperatures using the two formulae given below:

$$F = (1.8 \times °C) + 32°$$ $$C = (°F - 32°) \div 1.8$$

a)   180°C   b)   300°F   c)   0°C

d)   0°F   e)   100°C   f)   100°F

8.   You have been asked to help redecorate your school hall. The school hall is a large rectangular room that is 20m wide and 55m long. The height from the floor to the ceiling is 15m.

a)   What is the area of the floor of the hall that would need to be tiled? (Remember that Area = length x width)

   i)   If a box tiles covers a space of 1.25 m², how many boxes of tiles would the school need to buy if you added an extra 10% of tiles for emergencies?

   ii)   If each box of tiles costs R79.99 each, how much would it cost the school to tile the hall?

   iii) A second option for carpets is given. A box of 1.5 m² carpet cost R89.99. What would it cost to carpet the hall instead?

   iv)   Which option would you choose? Give two reasons for your answer.

b)   The hall has 10 windows that measure 2m across and 2m high. It also has 4 doors that measure 2m high and 1,8m across.

   i)   What is the area of all four walls in the hall (including all windows and doors)?

   ii)   What is the area of all the windows and doors?

   iii) What is the area of the hall that would actually need to be painted?

iv)   A tin of paint covers an area of 4m² per liter. How many liters of paint would we need?

v)   Paint can be purchased in 1 liter tins for R129.99, and in 5 liter tins for R499.99 each. How many 5 liter and how many 1 liter tins of paint would we need to paint the hall? And what would this cost?

9.   Lerato is lucky enough to be studying at Rhodes, Grahamstown in the Eastern Cape next year. She currently lives in Soshanguve, Pretoria, Gauteng. Here are some important distances for you:

Soshanguve to Oliver Tambo Airport: 89 km

Oliver Tambo Airport to Port Elizabeth Airport: 1 075 km

Port Elizabeth Airport to Rhodes: 130 km

a)   How far does Lerato have to travel from her home to Rhodes altogether?

b)   Lerato has two options to get to the OR Tambo airport from Soshanguve, she can choose to take a taxi which charges R20 per 5km, or she can choose to take an uber which costs R20 to book the trip and an additional R7.00 per km.

i)   What does a trip with the taxi cost?

ii)   What does a trip with the uber cost?

iii)   Which mode of transport should she use and why?

c)   Lerato is able to get a flight to Port Elizabeth at a discounted price of R599.00.

i)   What does it cost per km to fly to Port Elizabeth?

ii)   The flight is 2 hours long, what was the average speed of the flight?

d)   Lerato catches a bus from the Port Elizabeth Airport to Rhodes in Grahamstown.

i)   She gets onto the bus at 10:45 and arrives at the Rhodes bus stop at 13:30. How long did Lerato travel on the bus for?

ii)   Was it shorter or longer than her flight?

iii)   What was the average speed of the bus?

iv)   The bus ticket cost R250. What did the bus cost per km travelled?

e)   What did it cost Lerato to travel from Soshanguve to Rhodes altogether if she took the taxi to OR Tambo Airport?

f)   What was the cost per km for Lerato's entire trip?

10. Thandeka would like to get fit over the school holidays. She currently weighs 70 kg and is 1.65 m tall.

    a) Your BMI (Body Mass Index) is given by the formula $BMI = \frac{weight}{height^2}$. Calculate Thandeka's BMI.

    b) Below is an infographic describing the different BMI's.
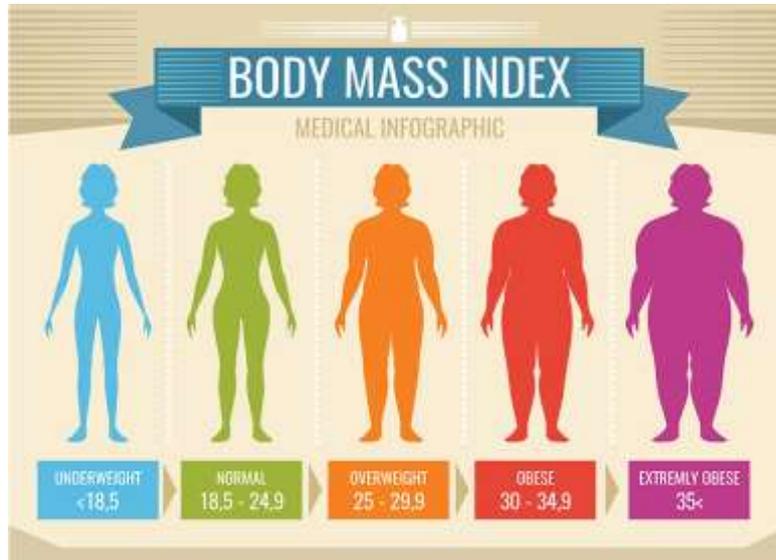
    Where does Thandeka fall on this scale?

    c) If Thandeka exercised and ate healthily for the next 3 months, and lost 10 kg, what would her BMI be then, and where would she fall on the BMI scale?

    d) Calculate your own BMI and determine where you fall on the scale.

11. For each of the products say which is cheaper:

    a) All bran – 500g @ R42.99 OR 1kg @ R69.99

    b) Rice – 2kg @ R33.59 OR 5kg @ R89.99

    c) Yoghurt – 175g @ R8.99 OR 500g @ R21.79

    d) Coffee – 200g @ R79.99 OR 100g @ R57.99

    e) Pocket file – 30 pages @ R33.99 OR 50 pages @ R63.99

12. Give the cost for each of these for the total amount purchased.

   a)   2.5 liters of Orange juice @ R11.99 per liter.

   b)   5 liters of mayonnaise @ R49.99 per liter

   c)   2kg of chicken @ R39.99 per 500g

   d)   600g of soup @ R69.99 per kg

   e)   400g of hot chocolate @ R90.00 per kg

13. Give the rate of consumption or concentration for each of the below for the units in brackets.

   a)   A household uses 30 000 liters of water in a 30-day month (liters / day)

   b)   A household uses 11 700 kWh per year (kWh / week)

   c)   A car uses 55 liters of petrol to travel 800 km (liters / 100 km)

   d)   It costs R850 to fill up a 60-liter tank of diesel (R/ liter)

   e)   It costs R560 for a 750-page textbook (R/ page)