SHARP

Worksheet 8 Memorandum: Measurement

Grade 11 Mathematical Literacy

1. a) 150mm (cm)

= 150 ÷ 10

= 15 cm

b) 1 500 000 mm (km)

= 1 500 000 ÷ 10

= 150 000 cm ÷ 100

= 1 500 m ÷ 1 000

= 1,5 km

c) 1 500 g (kg)

= 1 500 ÷ 1 000

= 1,5 kg

d) 1 569 kg (ton)

= 1 569 ÷ 1000

= 1,569 tons

e) 1 500 000 g (ton)

= 1 500 000 ÷ 1 000

= 1 500kg ÷ 1 000

= 1,5 tons

f) 549 cm (m)

= 549 ÷ 100

= 5,49m

g) 2 300 ml *(l)*

= 2 300 ÷ 1 000

= 2,3 *l*

h) 10mm (m)

= 10 ÷ 1 000

= 0,01 m

i) 20 ml (*l*)

= 20 ÷ 1 000

= 0,02 *l*

j) 239 g (kg)

= 239 ÷ 1 000

= 0,239 kg

k) 2km (m)

= 2 x 1 000

= 2 000m

l) 3.5 l (ml)

= 3,5 x 1 000

= 3 500ml

m) 20 kg (g)

= 20 x 1 000

= 20 000 kg

n) 3,45 m (mm)

= 3,45 x 1 000

= 3 450 mm

o) 45 *l* (ml)

= 45 x 1 000

= 45 000 ml

p) 1 ton (g)

= 1 x 1 000

= 1 000 kg x 1 000

= 1 000 000 g

q) 39 cm (mm)

= 39 x 10

= 390 mm

r) 100 *l* (ml)

= 100 x 1 000

= 100 000 ml

s) 0.5 kg (g)

= 0,5 x 1 000

= 500 g

t) 2,5 km (cm)

= 2,5 x 1000

= 2 500 m x 100

= 250 000 cm

2. a) 120 seconds (minutes)

= 120 ÷ 60

= 2 minutes

b) 2700 minutes (hours)

= 2 700 ÷ 60

= 45 hours

c) 144 hours (days)

= 144 ÷ 24

= 6 days

d) 3 days (hours)

= 3 x 24

= 72 hours

e) 4,5 hours (minutes)

= 4,5 x 60

= 270 minutes

f) 39 minutes (seconds)

= 39 x 60

= 2 340 seconds

g) 32 400 seconds (hours)

= 32 400 ÷ 60

= 540 minutes ÷ 60

= 9 hours

h) 7 200 minutes (days)

= 7 200 ÷ 60

= 120 hours ÷ 24

= 5 days

i) 2 days (seconds)

= 2 x 24

= 48 hours x 60

= 2 880 minutes x 60

= 172 800 seconds

j) 7 days, and 6 hours (minutes)

= 7 x 24 + 6

= 174 hours x 60

= 10 440 minutes

3. a) 3 tsp

= 3 x 5ml

= 15 ml

b) 3 Tbs

= 3 x 15 ml

= 45 ml

c) 3 cups

= 3 x 250ml

= 750 ml

d) $2\frac{1}{2}$ tsp

$= 2\frac{1}{2} \times 5\ ml$

$= 12\frac{1}{2}\ ml$

e) $2\frac{1}{2}$ Tbs

$= 2\frac{1}{2} \times 15\ ml$

$= 37\frac{1}{2}\ ml$

f) $2\frac{1}{2}$ cups

$= 2\frac{1}{2} \times 250\ ml$

$= 625\ ml$

g) $1\frac{1}{3}$ tsp

$= 1\frac{1}{3} \times 5\ ml$

$= 6\frac{2}{3}\ ml$

h) $1\frac{1}{3}$ Tbs

$= 1\frac{1}{3} \times 15\ ml$

$= 20\ ml$

i) $1\frac{1}{3}$ cups

$= 1\frac{1}{3} \times 250\ ml$

$= 333\frac{1}{3}\ ml$

4. a) 3 ft (m)

= 3 x 0,3048

= 0,9144 m

b) 25 in (cm)

= 25 x 2,54

= 63,5 cm

c) 25 miles (km)

= 25 x 1,6

= 40km

d) 28 oz (g)

= 28 x 28.35

= 793.8 g

e) 3 lb (kg)

= 3 x 0,4536

= 1,3608 kg

f) 3.6 m (ft)

= 3,6 ÷ 0.3048

= 11,811 ft

g) 200 cm (in)

= 200 ÷ 2.54

= 78,74 in

h) 32 km (miles)

= 32 ÷ 1,6

= 20 miles

i) 400 g (oz)

= 400 ÷ 28,35

= 14.11 oz

j) 5kg (lb)

= 5 x 0,4536

= 2,268 lb

k) 6 ft and 9 in (m)

= 6 x 0,3048 + 9 x 2,54

= 1,8288 m + 22,86 cm÷ 100

$= 1{,}8288\ \text{m} + 0{,}2286\ \text{m}$

l) 2lb, and 25 oz (g)

= 2 x 0,4536 + 25 x 28,35

= 0,9072 kg x 1 000 + 708,75 g

= 907,2 g + 708,75 g

= 1 615,95 g

5. a) 4 cm^3 (ml)
= 4 x 1 ml
= 4 ml

b) 10 mm^3 (ml)
= 10 x 0,001
= 0,01 ml

c) 50 m^3 (kl)
= 50 x 1
= 50 kl

d) 250 mm^3 (ml)
= 250 x 0,001
= 0,25 ml

e) 400 cm^3 (ml)
= 400 x 1
= 400 ml

f) 0,6 m^3 (l)
= 0,6 x 1 000
= 600 l

g) 10 ml (mm^3)
= 10 ÷ 0,001
= 10 000 mm^3

h) 10 ml (cm^3)
= 10 ÷ 1
= 10 cm^3

i) 4 kl (m^3)
= 4 ÷ 1
= 4 m^3

j) 500 ml (mm^3)
= 500 ÷ 0,001
= 500 000 mm^3

k) 150ml (cm^3)
= 150 ÷ 1
= 150 cm^3

l) 0.75 kl (m^3)
= 0,75 ÷ 1
= 0,75 m^3

6. a) 5 m^2 (cm^2)
= 5 x 10 000
= 50 000 cm^2

b) 1,5 m^2 (cm^2)
= 1,5 x 10 000
= 15 000 cm^2

c) 0,3 m^2 (cm^2)
= 0,3 x 10 000
= 3 000 cm^2

d) 500 cm^2 (m^2)
= 500 ÷ 10 000
= 0,05 m^2

e) 1 700 cm^2 (m^2)
= 1 700 ÷ 10 000
= 0,17 m^2

f) 50 000 cm^2 (m^2)
= 50 000 ÷ 10 000
= 5 m^2

7. a) 180°C

$F = (1.8 \times °C) + 32°$

$°F = (1{,}8 \times 180°) + 32°$

$\therefore\ °F = 356°F$

b) 300°F

$C = (°F - 32°) \div 1.8$

$°C = (300° - 32°) \div 1{,}8$

$\therefore\ °C = 149°C$

c) 0°C

$F = (1.8 \times °C) + 32°$

$°F = (1{,}8 \times 0) + 32°$

$\therefore\ °F = 32°F$

d) 0°F

$C = (°F - 32°) \div 1.8$

$°C = (0° - 32°) \div 1{,}8$

$°C = -17{,}78°C$

e) 100°C

$F = (1.8 \times °C) + 32°$

$°F = (1{,}8 \times 100°C) + 32°$

$°F = 212°F$

f) 100°F

$C = (°F - 32°) \div 1.8$

$°C = (100°F - 32°) \div 1{,}8$

$°C = 37.78°C$

8. a) Area = length x width

Area = 55m x 20m

Area = 1 100 m^2

i) Tiles needed = 1 100 ÷ 1.25 + 10% of boxes

= 880 boxes + 10% of 880

= 880 + 88

= 968 boxes

Therefore, we need to buy 968 boxes of tiles.

ii) Cost = R79,99 x 968

Cost = R 77 430,32 to tile the hall.

iii) Number of boxes = 1 100 ÷ 1.5 + 10% extra

Number of boxes = 733.33 + 10% of 734

Number of boxes = 734 + 74

Total number of boxes = 808

*Remember to round up no matter what the value of the decimal is.

Cost = 808 x R89.99

Cost = R 72 711.92

It would cost R72 711.92 to carpet the hall.

iv) Either answer is accepted, as long as the reasons are justified.

E.g. Tile – although the tiles are more expensive, they would be easier to clean and less likely to get damaged,

E.g. Carpet – the carpet is cheaper and would be warmer to sit on if chairs were not available.

The school should also look at what the cost to install the tiles or carpet would be as this would also influence the choice of tile or carpet.

b) i) Area = length x height x 2 + width x height x 2

Area = 55m x 15m x 2 + 20m x 15m x 2

Area = 1 650 m^2 + 600 m^2

Area = 2 250 m^2

ii) Area of 1 window = length x width

Area of 1 window = 2m x 2m

Area of 1 window = 4m^2

Area of 1 door = length x width

Area of 1 door = 2m x 1,8m

Area of 1 door = 3,6m^2

Total Area of windows and doors = 10 windows x 4m^2 + 4 doors x 3,6m^2

Total Area of windows and doors = 40m^2 + 14,4m^2

Total Area of windows and doors = 54,4 m^2

iii) Total area to be painted = area of walls – area of windows and doors

Total area to be painted = 2 250 m^2 – 54,4 m^2

Total area to be painted = 2 195,6 m^2.

iv) Liters of paint = total area to be painted ÷ area covered by 1 liter

Liters of paint = 2 195,6 ÷ 4

Liters of paint = 548,9 liters

We would need 549 liters of paint

v) Tins of paint = 549 ÷ 5

Tins of paint = 109 five-liter tins, and 4 left over, so 4 one-liter tins.

Cost = 109 x R499.99 + 4 x R129.99

Cost = R 54 498,91 + R 519,96 = R 55 018,87

9. a) Total distance travelled = Soshanguve to ORT + ORT to PE + PE to Rhodes

Total distance travelled = 89 km + 1 075 km + 130 km

Total distance travelled = 1 294 km

b) i) Cost = (89 ÷ 5) x R20

Cost = 17,8 x R20

Cost = R356

ii) Cost = R20 + R7 x 89

Cost = R20 + R623

Cost = R643

iii) She should use the taxi; it is almost half the price of the uber.

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

Cost per km = R599 ÷ 1 075 km

Cost per km = R 0.56 per km

It costs 56 cents per km

ii) Average speed = distance ÷ time

Average speed = 1 075 ÷ 2

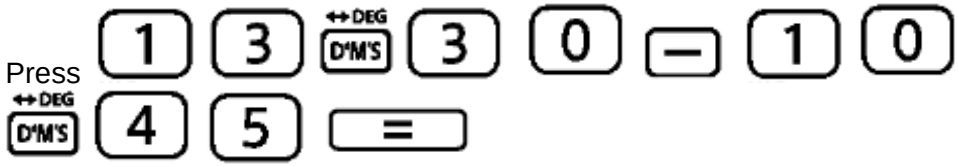
Average speed = 537,5 km/h

d) i) Time travelled = later time – earlier time

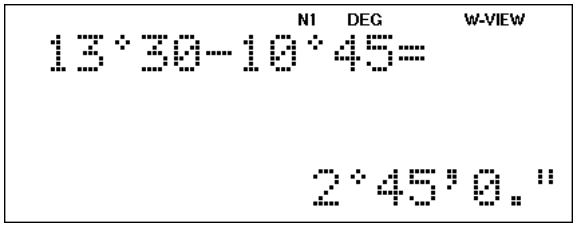
Time travelled = 13:30 – 10:45

Time travelled = 2:45 or 2 hours and 45 minutes

*You can do this question on your Sharp EL-W535SA calculator:

Press 

Your screen will look like this:



You can convert this into just hours by pressing 

ii) It was longer than her flight.

iii) Average speed = distance ÷ time

Average speed = 130km ÷ 2,75

Average speed = 47,27 km/h

iv) Cost per km = cost ÷ km travelled

Cost per km = R250 ÷ 130 km

Cost per km = R1,92 per km.

e) Total cost = Soshanguve to ORT + ORT to PE + PE to Rhodes

Total cost = R356 + R599 + R250

Total cost = R 1 205

f) Cost per km = total cost ÷ total travelled

Cost per km = R 1 205 ÷ 1 294 km

Cost per km = R0,93 per km.

It costs 93 cents per km.

10. a) $BMI = \frac{weight}{height^2}$

$BMI = \frac{70}{(1{,}65)^2}$

$BMI = \frac{70}{2{,}7225}$

$BMI = 25.71$

b) Thandeka just falls into the overweight part of the BMI scale.

c) $BMI = \frac{weight}{height^2}$

$BMI = \frac{60}{(1.65)^2}$

$BMI = \frac{60}{2{,}7225}$

$BMI = 22.04$

Thandeka now falls into the Normal BMI category.

d) E.g. $BMI = \frac{weight}{height^2}$ Your weight for eg is 85 kg, and height is 1,8 m tall

$BMI = \frac{85}{(1,8)^2}$ Substitute your values into the formula

$BMI = \frac{85}{3.24}$

$BMI = 26.23$

Therefore, this person would fall into the overweight category of the BMI scale.

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

500g x 2 = 1kg. The price for two would be R42,99 x 2 = R85.98

Therefore, the 1kg All bran is cheaper for the same amount.

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

2 kg Rice per kg – R33.59 ÷ 2 = R16,80

5 kg Rice per kg – R89.99 ÷ 5 = R18,00

Therefore, it is cheaper to buy the 2kg packet of rice.

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

175 g yoghurt per 100 g – R8,99 ÷ 1,75 = R5,14

500 g yoghurt per 100 g – R21.79 ÷ 5 = R4,36

Therefore, it is cheaper to buy the 500 g of yoghurt.

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

200g coffee per 100g – R79.99 ÷ 2 = R40,00

100g coffee per 100g = R57,99

Therefore, it is cheaper to buy the 200g of coffee.

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

30-page pocket file per 10 pages – R33,99 ÷ 3 = R11,33

50-page pocket file per 10 pages – R63,99 ÷ 5 = R12,80

Therefore, it is cheaper to buy the 30-page pocket file.

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

Cost = 2,5 x R11,99

Cost = R29,98

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

Cost = 5 x R49,99

Cost = R249,95

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

2 kg = 2000 g

2000 g ÷ 500 g = 4 portions of chicken

∴ Cost for 2kg = R39.99 x 4

∴ Cost for 2kg = R159,96

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

600g = 600 ÷ 1000 = 0,6 kg

∴ Cost of soup = 0,6 x R69.99

∴ Cost of soup = R41,99

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

400g = 400 ÷ 1000 = 0,4 kg

∴ Cost of hot chocolate = 0,4 x R90,00

∴ Cost of hot chocolate = R36,00

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)

liters / day = 30 000 liters ÷ 30 days

∴ liters / day = 1 000 liters / day

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

kWh / week = 11 700 kWh ÷ 52 weeks

∴ kWh / week = 225 kWh / week

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

liters / 100km = 55 liters ÷ 8 x 100 km

∴ liters / 100 km = 6,875 liters / 100 km

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

R/ liter = R850 ÷ 60 liters

∴ R/ liter = R14,17

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

R/ page = R560 ÷ 750 pages

∴ R/ page = R0,75 / page