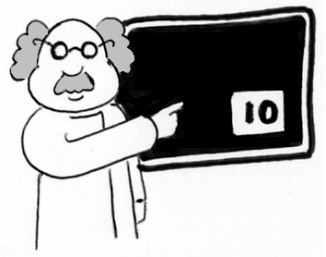
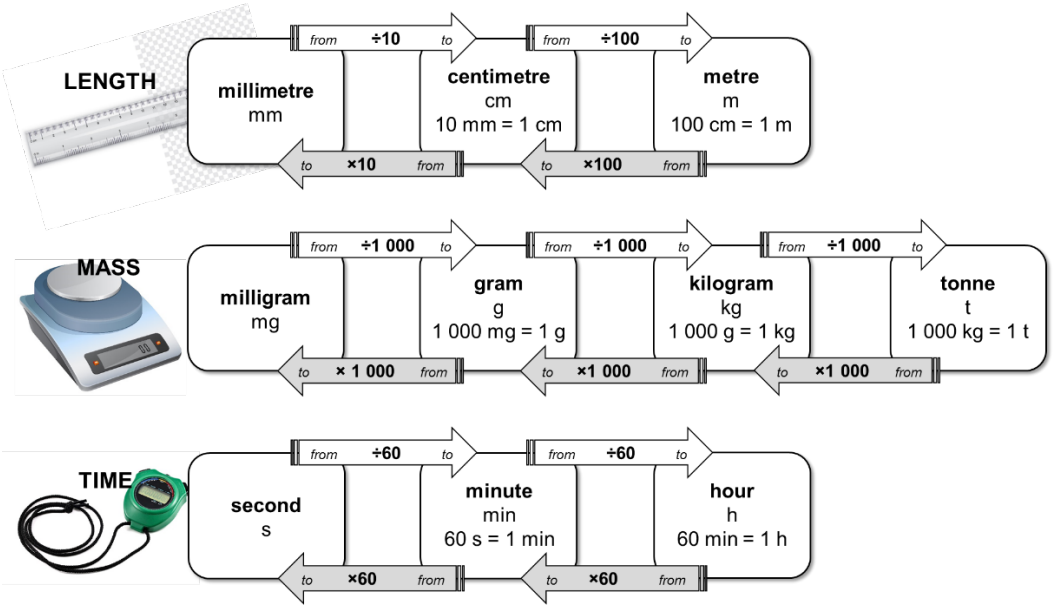


STARTER FOR 10...

0.2.6. Unit conversions 1 – Length, mass and time

Mo's teacher has drawn a diagram on the board to help him with converting quantities from one unit into another.



For example, to convert a length in millimetres into units of centimetres, divide by 10, eg 10 mm = 1 cm.

Use the diagram to help with the following unit conversions. (10 marks)

1. A block of iron has a length of 1.2 cm. Calculate its length in millimetres.

2. The width of the classroom is 7200 cm. Calculate its length in metres.

3. A reaction reaches completion after 4½ minutes. Convert this time into seconds.

4. The stop clock reads 2 min 34 s. Convert this time into seconds.

5. A method states that a reaction needs to be heated under reflux for 145 min. Calculate this time in hours and minutes.

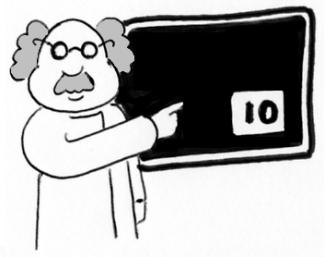
6. A factory produces 15 500 kg of ammonia a day. Calculate the mass of ammonia in tonnes.

7. A paper reports that 0.0265 kg of copper oxide was added to an excess of sulfuric acid. Convert this mass of copper oxide into grams.

8. A packet of aspirin tablets states that each tablet contains 75 mg of aspirin. Calculate the minimum number of tablets that contain a total of 1 g of aspirin.

9. A student measures a reaction rate to be 0.5 g/s. Convert the rate into units of g/min.

10. A factory reports that it produces fertiliser at a rate of 10.44 kg/h. Calculate the rate in units of g/s.



STARTER FOR 10...

0. TRANSITION SKILLS Answers

0.2.6. Unit conversions 1 – Length, mass and time

1. 12 mm *(1 mark)*

2. 72.00 m *(1 mark)*

3. 270 s *(1 mark)*

4. 154 s *(1 mark)*

5. 2 h 25 min *(1 mark)*

6. 15.5 t *(1 mark)*

7. 26.5 g *(1 mark)*

8. 75 mg/tablet = 0.075 g/tablet
1 g ÷ 0.075 g/tablet = 13.3 tablets
Minimum number of tablets needed = 14 *(1 mark)*

9. 30 g/min *(1 mark)*

NOTE In this example, as you are converting 1/the unit, you need to do the inverse of what is described in the diagram eg instead of ÷ 60, × 60.

10. 10.44 kg/h = 10 440 g/h = 174 g/min = 2.9 g/s *(1 mark)*

0.2.7. Unit conversions 2 – Volume

1. drinks bottle, 1 dm^3; sugar cube, 1 cm^3; washing machine, 1 m^3 *(1 mark)*

2. To convert a volume in **cm^3** into a volume in **dm^3**, divide by 1000. *(½ mark)*
To convert a volume in **cm^3** into a volume in **m^3**, divide by 1 000 000. *(½ mark)*

3. a. 1.6 dm^3 *(1 mark)*
b. 5.5×10^{-4} m^3 *(1 mark)*
c. 1350 cm^3 *(1 mark)*
d. 375 000 000 cm^3 *(1 mark)*
e. 0.006 54 m^3 *(1 mark)*

4.

	£ per m^3		p per cm^3		p per dm^3	
Cylinder 'a'	7.27	or	7.27×10^{-4}	or	0.727	*(1 mark)*
Cylinder 'b'	7.87		7.87×10^{-4}		0.787	*(1 mark)*
Cylinder 'c'	4.11		4.11×10^{-4}		0.411	*(1 mark)*

Therefore 'c' is the best value for money.