**Chapter 1: Further questions**

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| --- | --- | --- |
| measurement | unit | symbol |
| Length | metre | m |
| Mass | kilogram | kg |
| time | seconds | s |

1.

2. a. 1000 mg

 b. 1000 g

 c. 1000 g 1000000 mg

 d. 4000 m 4000000 mm

 e. 5000 m 500000 cm

3. a. 3 m

 b. 0,5 kg

 c. 1,5 km

 d. 0,25 ms

 e. 500 ms

 f. 750 m

 g. 2500 g

 h. 800 mm

|  |  |  |  |
| --- | --- | --- | --- |
| length | width | height | Volume |
| 2 cm | 3 cm | 4 cm | 24 cm3 |
| 5 cm | 5 cm | 4 cm | 100 cm3 |
| 6 cm | 10 cm | 5 cm | 300 cm3 |
| 0,5 cm | 10 cm | 10 cm | 50 cm3 |

4.

5. a. 2 km = 2000 m so 2500 m is larger

 b. 2 m = 2000 mm so this is the larger one

 c. 2 tonnes = 2000 kg so 3000 kg is larger

 d. 2 L = 2 dm3 = 2000 cm3 so this the larger one

6. a. INCORRECT 1 mg = 0,001 g

 b. CORRECT 1000 mg = 1 g

 c. INCORRECT 1000000 mg = 1000 g

 d. CORRECT 1000000 mg = 1000 g = 1 kg

7. a. kg

 b. m, km

 c. m3, cm3, mL

 d. ms, s

 e. g/cm3, kg/m3

8. For each block you have to calculate the density. To do this, you need mass (given) and volume (must be calculated, using length, breadth and height).

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| --- | --- | --- | --- |
| Grocery list | Formula | Calculation | Answer + Unit |
| m = 480 gV = 80 cm3$ρ $= ? | $$ρ= \frac{m}{V}$$ | $$ρ= \frac{480 g}{80 cm^{3}}$$ |  $ ρ$ = 6,0 g/cm3 |

 Block A

 Block B

|  |  |  |  |
| --- | --- | --- | --- |
| Grocery list | Formula | Calculation | Answer + Unit |
| m = 360 gV = 120 cm3$ρ $= ? | $$ρ= \frac{m}{V}$$ | $$ρ= \frac{360 g}{120 cm^{3}}$$ |  $ ρ$ = 3,0 g/cm3 |

 Block C

|  |  |  |  |
| --- | --- | --- | --- |
| Grocery list | Formula | Calculation | Answer + Unit |
| m = 800 gV = 100 cm3$ρ $= ? | $$ρ= \frac{m}{V}$$ | $$ρ= \frac{800 g}{100 cm^{3}}$$ |  $ ρ$ = 8,0 g/cm3 |

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| --- | --- | --- | --- |
| Grocery list | Formula | Calculation | Answer + Unit |
| m = 600 gV = 60 cm3$ρ $= ? | $$ρ= \frac{m}{V}$$ | $$ρ= \frac{600 g}{60 cm^{3}}$$ |  $ ρ$ = 10,0 g/cm3 |

 Block D

9. a. You don’t know the mass of the liquid. To know this you need the mass of the measuring cylinder, which is not given.

 b. Yes, we know the mass and the volume of the stone.

 c. No, only the density of the stone.

10. Mass = 0,03 kg – 0,02 kg = 0,01 kg

 Volume = 0,008 m3

|  |  |  |  |
| --- | --- | --- | --- |
| Grocery list | Formula | Calculation | Answer + Unit |
| m = 0,01 kgV = 0,008 m3$ρ $= ? | $$ρ= \frac{m}{V}$$ | $$ρ= \frac{0,01 kg}{0,008 m^{3}}$$ |  $ ρ$ = 1,25 kg/m3 |

11. a. Volume X: 0,4m x 0,5m x 0,5m = 0,1 m3

 Volume Y: 0,2m x 0,5m x 0,5m = 0,05 m3

 b. 1 m3 is 10x as much as the original volume so the mass will be 10x as much as well.

 800 kg.

 c.

|  |  |  |  |
| --- | --- | --- | --- |
| Grocery list | Formula | Calculation | Answer + Unit |
| m = 80 kgV = 0,1 m3$ρ $= ? | $$ρ= \frac{m}{V}$$ | $$ρ= \frac{80 kg}{0,1 m^{3}}$$ |  $ ρ$ = 800 kg/m3 |

 d.

|  |  |  |  |
| --- | --- | --- | --- |
| Grocery list | Formula | Calculation | Answer + Unit |
| m = 50 kgV = 0,05 m3$ρ $= ? | $$ρ= \frac{m}{V}$$ | $$ρ= \frac{50 kg}{0,05 m^{3}}$$ |  $ ρ$ = 1000 kg/m3 |

12. a. The mass per cm3 of mercury is 13,6 g. This is the highest mass per given volume. TRUE

 b. Water has a mass of 1 g per cm3. Kerosene has a mass of 0,87 g per cm3. FALSE

 c. For this statement to be true or false we need to do calculations.

 Volume of 1 g of iron

|  |  |  |  |
| --- | --- | --- | --- |
| Grocery list | Formula | Calculation | Answer + Unit |
| m = 1,0 gV = ?$ρ $= 7,9 g/cm3 | $$ρ= \frac{m}{V}$$$$V= \frac{m}{ρ}$$ | $$V= \frac{1,0 g}{7,9 ^{g}/\_{cm^{3}}}$$ |  $ V$ = 0,127 g/cm3 |

 Volume of 1 g of copper

|  |  |  |  |
| --- | --- | --- | --- |
| Grocery list | Formula | Calculation | Answer + Unit |
| m = 1,0 gV = ?$ρ $= 8,9 g/cm3 | $$ρ= \frac{m}{V}$$$$V= \frac{m}{ρ}$$ | $$V= \frac{1,0 g}{8,9 ^{g}/\_{cm^{3}}}$$ |  $ V$ = 0,112 g/cm3 |

 FALSE

 d. Both substances have a mass of 1g and are equal in mass. FALSE

13. A question you don’t have to do and we skip.