1. All the sides of a plastic cube are 8.0 cm long. Fig. 3.1 shows the cube.

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The mass of the cube is 0.44 kg.

1. Explain what is meant by *mass*.

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1. **(i)** Calculate the density of the plastic from which the cube is made.

**Density = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**(ii)** The density of one type of oil is 850 kg / $m^{3}$.
State and explain whether the cube floats or sinks when placed in a container of this oil.

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1. On the Moon, the weight of the cube is 0.70 N.
2. Calculate the gravitational field strength on the Moon.

Gravitational field strength = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. In a laboratory on the Moon, the plastic cube is held stationary, using a clamp, in a beaker of the oil of density 850 kg / $m^{3}$..

The arrangement is shown in Fig. 3.2.



The lower face of the cube is 3.0 cm below the surface of the oil.

Use your answer to **(c)(i)** to calculate the pressure due to the oil on the lower face

of the cube.

 Pressure = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. A student is studying elephants. Fig. 2.1 shows an elephant.



**(a)** The student measures the elephant and records the values, as shown in the table.

Complete the table by adding a suitable unit for each measurement. Choose the units from

those shown in the box.



**(b)** Using information from the table in **(a)**:

**(i)** Calculate the weight of the elephant.

weight = ..................................................... N

**(ii)** Calculate the pressure the elephant exerts on the ground when it is standing on four

feet. Include a unit.

pressure = .........................................................

1. A flask contains gas with a pressure lower than atmospheric pressure.

Fig. 3.1 shows equipment being used to measure the pressure of the gas in the flask.



**(a)** State the name of the equipment shown in Fig. 3.1 that is used to measure the pressure of

the gas.

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**(b)** The atmospheric pressure is equal to 760 mm Hg.

The distance between mercury level A and mercury level B is 280 mm.

Determine the pressure of the gas inside the flask.

pressure = ............................................ mm Hg

**(c)** The flask is cooled. Describe the effect, if any, the cooling has on

mercury level A .........................................................................................................................

mercury level B .........................................................................................................................

1. **(a)** A student has a piece of metal that has an irregular shape. The weight of the metal is 3.0 N.

Calculate the mass of the metal.

mass = ..................................................... kg

**(b)** Fig. 2.1 shows the piece of metal, a measuring cylinder and a beaker containing water.



**(i)** Describe how to determine the volume of the metal, using the equipment in Fig. 2.1.

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**ii)** Explain why the procedure in **(b)(i)** is not suitable for finding the volume of a piece of

low-density wood that is of similar shape and size to the piece of metal in **(a)**.

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**(iii)** The mass of another piece of metal is 405 g and its volume is 150 cm3.

Calculate the density of the metal. State the unit.

density = ..........................................................