

Answer on Question #47682 – Physics – Other

Question.

A student is given 10 marble chips each with a mass of 15 grams. He proceeds to determine the density of these chips using a measuring cylinder. Initially the measuring cylinder has a volume of water recording 20cm cube but after the chips was placed the water level rose to 70cm cube. What is the density of one marble chip?

Given:

$$N = 10$$

$$m_0 = 15 \text{ g}$$

$$V_1 = 20 \text{ cm}^3$$

$$V_2 = 70 \text{ cm}^3$$

Find:

$$\rho = ?$$

Solution.

By definition the density can be defined as ratio of change of mass and change of volume. So, in our case we obtain:

$$\rho = \frac{Nm_0}{V_2 - V_1}$$

Calculate:

$$\rho = \frac{10 \cdot 15}{70 - 20} = \frac{150}{50} = 3 \frac{\text{g}}{\text{cm}^3} = 3000 \frac{\text{kg}}{\text{m}^3}$$

Answer.

$$\rho = \frac{Nm_0}{V_2 - V_1} = 3 \frac{\text{g}}{\text{cm}^3} = 3000 \frac{\text{kg}}{\text{m}^3}$$