

### Answer on Question #80332, Chemistry/ General Chemistry

density = 2.70 g/cm squared

volume= 196cm cubed

The force of gravity acting on an object is  $F = mg$ , where  $m$  is the mass of an object and  $g$  is the acceleration of gravity ( $9.8 \text{ m/s}^2$ ). How much work do you do on the aluminum sphere if you raise it from the floor to a height of 2 m?

Express the answer in joules to two significant figures.

#### Solution

$$W = F_g \times h$$

$$F_g = mg$$

$$m = d \times V$$

$$\text{So, } W = mgh = d \times V \times g \times h$$

$$\begin{aligned} W &= 2.70 \frac{\text{g}}{\text{cm}^3} \times 196 \text{ cm}^3 \times \frac{1 \text{ kg}}{1000 \text{ g}} \times 9.8 \frac{\text{m}}{\text{s}^2} \times 2 \text{ m} \\ &= 10.37232 \text{ J or (rounded to two significant figures) } 10 \text{ J} \end{aligned}$$

**Answer: 10 J**