

## Activity 2: Units and Unit Conversions

*Note that in showing your work, link together a chain of fractions as illustrated in your workbook. For example, to convert 1 mile to meters:*

$$\text{distance in meters} = (1 \text{ mi}) \left( \frac{5280 \text{ ft}}{1 \text{ mi}} \right) \left( \frac{12 \text{ in}}{1 \text{ ft}} \right) \left( \frac{2.54 \text{ cm}}{1 \text{ in}} \right) \left( \frac{1 \text{ m}}{100 \text{ cm}} \right) = 1609 \text{ m}$$

*The conversion factors above may be useful for some of the problems today!*

1. Calculate the height of a 5'6" person in meters. (In case you're not familiar with this notation, 5'6" means 5 ft plus 6 in).



5. Over a certain range of speeds, air resistance,  $f$ , is given as  $f$

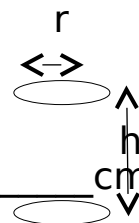
$$= CA\rho v^2.$$

$C$  is a constant that depends on the shape and texture of the object,  $A$  is the cross-sectional area of the object in  $\text{m}^2$ ,  $\rho$  is the density of the fluid in  $\text{kg}/\text{m}^3$ , and  $v$  is the speed of the object relative to the fluid in  $\text{m}/\text{s}$ . Given that  $f$  is a force in

units of Newtons  $\left(1 \text{ N} = 1 \frac{\text{kg} \times \text{m}}{\text{s}^2}\right)$ , find the units of the constant

$C$ .

6. In this “activity”, you will be given a small cylinder to measure, reviewing significant figures and units along the way.



Measure and record “h” to the nearest 0.01 cm: \_\_\_\_\_ cm

Measure and record “r” to the nearest 1 mm: \_\_\_\_\_ mm

*(Divide the diameter by 2; note that dividing by a constant number (2 in this case) does not change the number of significant digits).*

Calculate the volume  $V$  of your cylinder in  $\text{m}^3$ , noting that

$V = \pi r^2 h$ . Make sure to use consistent units and don't forget

to pay attention to significant figures! Write your answer in standard scientific notation.

7. Fill in the blanks for the following with either the words “reasonable” or “not reasonable”. Covert to units that you are familiar with in order to assess each.

Betty completed this activity in a time of 0.18 Ms.

\_\_\_\_\_

John is 1780000000 nm tall. \_\_\_\_\_

Paul ran the 50-yard dash in 222  $\mu$ s. \_\_\_\_\_

George ate a 30,658 mm<sup>2</sup> piece of pizza for lunch.

\_\_\_\_\_

Ringo drove on the interstate at 0.027 km/ s.

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