Science 10   Name: Key

Converting Units

1. Convert the following to meters:

   a. $(.32 \text{ km}) \left(\dfrac{1000 \text{ m}}{1 \text{ km}} \right) = \boxed{320 \text{ m}}$

   b. $(549.43 \text{ km}) \left(\dfrac{1000 \text{ m}}{1 \text{ km}} \right) = \boxed{549430 \text{ m}}$

2. Convert the following to kilometers

   a. $(.12 \text{ m}) \left(\dfrac{1 \text{ km}}{1000 \text{ m}} \right) = .00012 \text{ km}$

   b. $(438945 \text{ m}) \left(\dfrac{1 \text{ km}}{1000 \text{ m}} \right) = 438.945 \text{ km}$

3. Convert the following to seconds

   a. $(2 \text{ hr}) \left(\dfrac{3600 \text{ s}}{1 \text{ hr}} \right) = 7200 \text{ s}$

   b. $(2.5 \text{ hr}) \left(\dfrac{3600 \text{ s}}{1 \text{ hr}} \right) = 9000 \text{ s}$

4. Convert the following to hours

   a. $(489 \text{ s}) \left(\dfrac{1 \text{ h}}{3600 \text{ s}} \right) = .13583 \text{ h}$

   b. $(3600 \text{ s}) \left(\dfrac{1 \text{ h}}{3600 \text{ s}} \right) = 1 \text{ h}$

5. Convert the following to m/s

   a. $\left(\dfrac{32 \text{ km/hr}}{\text{hr}} \right) \left(\dfrac{1000 \text{ m}}{1 \text{ km}} \right) \left(\dfrac{1 \text{ hr.}}{3600 \text{ s}} \right) = 8.89 \dfrac{\text{m}}{\text{s}}$

   b. $(100 \text{ km/hr}) \left(\dfrac{1000 \text{ m}}{1 \text{ km}} \right) \left(\dfrac{1 \text{ hr}}{3600 \text{ s}} \right) = 27.78 \dfrac{\text{m}}{\text{s}}$

6. Convert the following to km/hr

   a. $\left(\dfrac{45 \text{ m/s}}{\text{s}} \right) \left(\dfrac{3600 \text{ s}}{1 \text{ h}} \right) \left(\dfrac{1 \text{ km}}{1000 \text{ m}} \right) = 162 \dfrac{\text{km}}{\text{h}}$

   b. $(100 \text{ m/s}) \left(\dfrac{3600 \text{ s}}{1 \text{ h}} \right) \left(\dfrac{1 \text{ h}}{1000 \text{ m}} \right) = 360 \dfrac{\text{km}}{\text{h}}$

Unit Conversions:

1 hour = 3600 s
1 km = 1000 m
1 m = 100 cm

$V = \frac{d}{t}$ $t = \frac{d}{V}$ $V \cdot t = d$

$d = V \cdot t$

3. Complete the following table. Show all your work and use the correct units.

Question	Formula Used	Answer
a) A woman wants to paddle 420 m across a lake in her kayak. If she paddles across the lake at an average velocity of 2.8 m/s, how long does it take her to cross?	$V = 2.8 \frac{m}{s}$ $d = 420 m$ $t = ?$ $t = \frac{d}{V}$ $= \frac{420}{2.8}$	$150 s$
b) If a cyclist rides west at 14 m/s, how long would it take her to travel 980 m? t	$t = \frac{d}{V} = \frac{980}{14}$	$70 s$
c) A cheetah runs at a velocity of 30 m/s [E]. If it runs for 8.5 s, what is its displacement? d	$d = V \cdot t$ $= 30 (8.5)$	$255 m$
d) The Australian dragonfly can fly at 16 m/s. How long does it take to fly 224 m? t	$t = \frac{d}{V} = \frac{224}{16}$	$14 s$
e) The Skyride gondola at Grouse Mountain in North Vancouver takes 8 min to go up the 3 km mountain. What is the average velocity of the gondola? V	$V = \frac{d}{t} = \frac{3 km}{8 min}$	$.375 \frac{km}{min}$
f) Due to plate tectonics, the North American and European continents are drifting apart at an average speed of about 3 cm per year. At this speed, how long (in years) will it take for them to drift apart by another 2400 m? t	$t = \frac{d}{V} = \frac{\cancel{3 cm} 2400m}{.03 \frac{m}{yr}}$	$9,000 yr$
g) A dragster heading north, reaches a velocity of 628 km/h from rest in 3.72 s. How far did it travel in that time? t	$t = \frac{d}{V} =$	$.64728 km$

$.174 \frac{km}{s}$

$d = V \cdot t$
$= (.174)(3.72)$