Name: _____   Block: _____

Assigning Variables #2

For each of the following word problems:

A. Underline all numbers with their units and the quantity you're looking for.

B. Write the variable that corresponds with each unit next to the unit in the problem. Write and circle the variable that corresponds with the quantity you're looking for next to its name.

C. Find an equation that includes all of the variables you wrote next to the problem.

D. Substitute the numbers into the equation and solve it. Be sure to include the correct units with your answer.

This will involve a scavenger hunt through your physics Reference Tables. That's part of the assignment. (The topic after each question tells which section of the reference tables the equation appears in.)

1. What is the acceleration of a car whose velocity changes from $60.\frac{m}{s}$ to $80.\frac{m}{s}$ over a period of $5.0\,\text{s}$? (*Hint: use v_o for the initial velocity and v for the velocity at the end.*) (mechanics/kinematics)

$\boxed{4\,\frac{m}{s^2}}$

2. If the normal force on an object is $100.\,\text{N}$ and the coëfficient of friction is 0.35, what is the force of friction on the object? (*Hint: you will need information from the list of variables that appears to the right of the formulas.*) (mechanics/forces)

$\boxed{35\,\text{N}}$

3. A car has a mass of $1200\,\text{kg}$ and kinetic energy of $240\,000$ J. What is the car's velocity? (mechanics/energy)

$\boxed{20\,\frac{m}{s}}$

4. A 1200 W hair dryer is plugged into a electrical circuit with a voltage of 110 V. How much electric current flows through the hair dryer? (electricity/circuits)

10.9 A

5. What is the velocity of a photon (wave of light) through a block of clear plastic that has an index of refraction of 1.40? (*Hint: you will need information from the list of variables to the right of the formula. If you need to look up the values of a constants, check Table B on page 2 of your Reference Tables.*) (waves/reflection & refraction)

$2.14 \times 10^8 \frac{\text{m}}{\text{s}}$

6. If the distance from a mirror to an object is 0.8 m and the distance from the mirror to the image is 0.6 m, what is the distance from the lens to the focus? (waves/mirrors & lenses)

0.343 m

7. What is the momentum of a photon that has a wavelength of 400 nm?
(*Hint:* 400 nm $= 4 \times 10^{-7}$ m.) (modern physics/energy)

1.65×10^{-27} N·s

8. If a pressure of 100 000 Pa is applied to a gas and the volume decreases by 0.05 m^3, how much work was done on the gas? (fluid mechanics/work)

5 000 J