**Unit 1 Review Assignment** (answer on a separate piece of paper) (Turn this in when you take your test)

1. How is a scientific law different from a scientific theory?
2. What is a hypothesis?
   1. What are the 4-components of a quality hypothesis?
3. What factors make an experiment “controlled”? (hint: there are five factors)
4. List the steps of the scientific method. Include a short sentence describing each step.
5. Use the metric system ladder to convert the following measurements.
   1. 10.4 L into mL
   2. 564.32 cm into km
   3. 120.0 mg into g
   4. 425.23 kg into g
   5. 0.00285 kL into mL
6. Convert the following scientific notation figures into standard notation.
   1. 3.83 × 101
   2. 4.31 × 104
   3. 8.95 × 10-2
   4. 9.12 × 106
   5. 561 × 10-3
7. Convert the following standard notation figures into scientific notation.
   1. 0.598
   2. 0.000853
   3. 314.76
   4. 78,376.27.0
   5. 4,762,823,673.0
8. What is the difference between a Scalar Quantity and a Vector Quantity?
   1. Identify the following terms as either a scalar quantity or a vector quantity. Explain your choice.
      1. Distance & Position
      2. Speed & Velocity
      3. Acceleration.
         1. Is it possible to accelerate without changing your speed? If so, how?
9. What are the three versions of the velocity equation?
   1. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
   2. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
   3. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
      1. Use the velocity equations to answer the following questions (show all work).
         1. A world speed record was set on October 8, 1978 by Ken Warby. If Ken drove his motorboat a distance of 1500 meters in 8.102 seconds what was his speed record?
         2. A car travels 240 km in 7200 seconds. A sprinter ravels 100 meters in 9.5 seconds. Which is traveling faster? By how much?
         3. You drive a car from Milwaukee to Chicago, a distance of 150 km. If you completed this drive in 95 minutes. What is the velocity in km/min?

**Continued 🡪**

* + - 1. After an impact involving a non-functioning satellite, a paint chip leaves the surface of the satellite at a speed of 96 m/sec. After 17 seconds, how far has the chip landed?
      2. The space shuttle Endeavor is launched to altitude of 500 km above the surface of the Earth. The shuttle travels at an average rate of 700 m/sec. How long will it take for Endeavor to reach orbit?

1. What is the acceleration equation?
   1. Use the acceleration equation to answer the following questions (show all work)
      1. A helicopter’s velocity increases from 25 m/sec to a final velocity of 60 m/sec. This process takes 5 seconds to happen. What is the acceleration of this helicopter?
      2. As a cyclist climbs a hill she slows down from 25 mi/hr to a velocity of 6 mi/hr. This takes the cyclist 10 seconds to accomplish. What is the acceleration of the cyclist?
      3. A skateboarder traveling at 7 m/sec rolls to a stop at the top of a ramp in 3 seconds. What is the skateboarder’s acceleration?
      4. A car starting from rest accelerates at a rate of 8 m/sec2. What is the final speed of this car at the end of a 4.0 second acceleration?
      5. A cyclist accelerates at a rate of 4.6 m/sec2. How long will It take the cyclist to reach a speed of 18 m/sec if they started from a standstill?
2. How does one calculate the slope of a line on a graph? (hint: there are three versions of the equation)
   1. What is the slope of a Position (distance) Vs. Time graph?
   2. What is the slope of a Velocity (speed) Vs. Time graph?
3. Use the following data to create a Position (distance) Vs. Time graph.

|  |  |
| --- | --- |
| Time (seconds) | Distance (or position) (meters) |
| 0 | 0 |
| 1 | 10 |
| 2 | 20 |
| 3 | 30 |
| 4 | 40 |
| 5 | 50 |

* 1. How far has the object traveled in the first 2.5 seconds of the journey?
  2. What is the velocity (speed) of the object depicted in your graph?

1. Use the following data to create a Velocity (speed) Vs. Time graph.

|  |  |
| --- | --- |
| Time (seconds) | Velocity (or speed) (meters/second) |
| 0 | 0 |
| 2 | 10 |
| 4 | 20 |
| 6 | 40 |
| 8 | 80 |
| 10 | 160 |

* 1. What is the velocity of the object after 4.5 seconds?
  2. What is the acceleration of the object depicted in your graph?