**Vocabulary:**

|  |  |  |
| --- | --- | --- |
| Independent Variable |  | |
| Dependent variable |  | |
| Constant |  | |
| Evidence |  | |
| Pseudoscience |  | |
| Conclusion |  | |
| Metric system |  | |
| Hypothesis |  | |
| Science |  | |
| Motion |  | |
| Speed |  | |
| Distance |  | |
| Displacement |  | |
| Time |  | |
| Velocity |  | |
| Acceleration |  |
| Deceleration |  |
| Force |  |
| Air Resistance |  |
| Newton |  |
| Gravity |  |
| Friction |  |
| Static Friction |  |
| Sliding Friction |  |
| Rolling Friction |  |
| Fluid Friction |  |
| Mass |  |
| Acceleration |  |
| Inertia |  |

|  |  |
| --- | --- |
| Units of Length/Distance | *Meters, centimeters, millimeters, yards, feet, kilometers, miles* |
| Units of Time |  |
| Units of Volume |  |
| Units of Mass |  |
| Units of Speed |  |
| Units of Velocity |  |
| Units of Acceleration |  |
| Units of Force |  |

**Important Formulas:**

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| --- | --- | --- |
| **Speed:** | **Acceleration:** | **Force:** |

**Speed Problems:**

1. I walked 360 meters to a friend’s house. I walk at a speed of 60 meters a minute. How long did it take me to get to my friend’s house?

2. A spider crawls up the wall in about 5 seconds. The wall is 45 meters high. What was his speed?

3. A shark is swimming north in the ocean at a speed of 45 km/hour. He travels for 2 hours before finding food. How far did he swim to find food?

**Acceleration Problems:**

4. Tina rolls a ball on the table at a speed of 1.5m/s. The ball rolls for 10 seconds before coming to a stop. What is the ball’s acceleration?

5. During a student-teacher basket ball game, Mario is trying to move past Mr. Martin. Both are running at about 4 m/s. Mario accelerated for about 3 seconds to a speed of 8m/s. What is his acceleration?

**Force Problems:**

1. A car with a mass of 1000 kg accelerates at 4 m/s2. How much force does the car produce?

F=\_\_\_\_\_\_

m=\_\_\_\_\_\_

a=\_\_\_\_\_\_

1. What is the mass of a rocket which accelerates at 500 m/s2 and has a force of 500 N?

F=\_\_\_\_\_\_

m=\_\_\_\_\_\_

a=\_\_\_\_\_\_

1. Malik sprints with an acceleration of 10 m/s2. What is his mass if his force is 750 N?

F=\_\_\_\_\_\_

m=\_\_\_\_\_\_

a=\_\_\_\_\_\_

**Free Body Diagrams:** Draw the free body diagrams for the following scenarios.

1. A car is at rest at a stop light.
2. A skydiver falls from the sky at constant velocity
3. A force is applied to a skate board to move it left along a path with a leftward acceleration.

**Calculate Net Force:**

1. A quarterback throws a football down field with a force of 5 N. The air resistance on the football is 1 N.
   1. Diagram the forces acting on the football.
   2. What is the net force on the football?
   3. Is the force balanced or unbalance?
2. A meteorite falls to the earth at a constant velocity. The meteorite has a mass of 1,000 N.
   1. Diagram the forces acting on the football.
   2. What is the net force on the football?
   3. Is the force balanced or unbalance?

**Distance and displacement**

1. A rat is roaming the NLCP cafeteria to find some crumbs. First, it runs 5 meters east towards the writing center and then 12m north to the windows. Lastly, it stops to eat a fallen chip.

|  |  |
| --- | --- |
| Diagram of the Rat’s movement:  13 m | 1. What is the rat’s distance? 2. What is the rat’s displacement? |

1. Tamara forgot her calculator in Ms. Wagner’s class. She runs 150m down the hallway from her math class to her science class. She finds her calculator, sees that the bell is about to ring, and runs down the hall back to her math class.

|  |  |
| --- | --- |
| Draw a diagram: | 1. What is Tamara’s distance? 2. What is Tamara’s displacement? |

**Science Vs. Pseudoscience**

|  |  |
| --- | --- |
| *Science is….* | *Pseudoscience is…* |
| Example of science: | Example of pseudoscience: |

**Decide if the sentences below are science or pseudoscience.**

Walking under a ladder will cause bad luck?

Some plants eat meat.

**Experiment Practice:**

1. A zoo keeper wants to find out what animal sleeps the most. He sets up an experiment where each animal is in a cage and exercises two hours a day. The zoo keeper then records the how many hours a day the animals sleep. He runs the test on 3 bears, 3 eagles, and 3 Asian carp fish and then finds the average sleep time for each.
2. What is the independent variable? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
3. What is the dependent variable? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
4. What does the zookeeper keep constant? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
5. Write a hypothesis for this experiment. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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Find the volume of the graduated cylinders: Draw a line that is 6.3cm long

 