Newton's Laws of Motion

In 1687, Sir Isaac Newton explained and simplified the relationship between force and motion. He came up with three laws of motion that can be used to explain the movement of all objects in the universe.. As you read each law, think of ways it effects your life on a daily basis.

Newton's First Law of Motion

An object at rest will stay at rest unless acted on by an unbalanced force. An object in motion will stay in motion at the same speed and in the same direction unless acted on by an unbalanced force.

Newton's first law of motion basically says that an object will keep doing whatever it's doing, whether sitting still or moving, unless the forces acting on it become unbalanced. For example, imagine a table cloth with a plate of pizza on it. That pizza will stay there on the plate until a force picks it up or moves it. That's the first part of the law. The second part comes into play when a dog pulls the table cloth and the plate of pizza goes flying towards the floor (or toward your lap) until something stops it. This law is also called the law of inertia. Inertia is an object's tendency to resist (or stop) a change in motion. The greater an object's mass, the greater its inertia and the larger the force needed to overcome the inertia.

Newton's Second Law of Motion

The acceleration of an object by a force is inversely proportional to the mass of the object and directly proportional to the force.

The first part of this law says that the smaller the mass of an object, the greater its acceleration when a force is applied. For example, if you push a soccer ball (less mass) with the same force as a bowling ball (more mass), the acceleration will be greater in the soccer ball. The second part states that the greater the force applied to an object, the greater the object's acceleration. For example, if you pushed two soccer balls of equal mass with different amounts of force, the soccer ball acted on by the greater force will accelerate more. Mathematically, force equals mass multiplied by acceleration.

Newton's Third Law of Motion

For every action, there is an equal but opposite reaction.

Newton's third law of motion basically states that all forces act in pairs. When one object exerts a force on a second object, the second object exerts a force back that is equal in size but opposite in direction. When you stand up from sitting in a chair, you must exert an action force against the chair and the floor to stand up. When you put forth that action force, the chair and the floor respond by pushing up (opposite force of you pushing down) and allowing you to stand up! The force the chair and floor exert is called a reaction force. These action and reaction forces are at work even when objects are not moving. If you lean a book on a bookshelf at an angle so it doesn't fall over (action force), the bookshelf pushes back on the book with the same force (reaction force) so neither the book or the shelf move.

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Instructions:

Glue down the Newton's Laws flip flaps. On the front of the flap, copy what each law says under 'What it says' then write the law in your own words to make it more understandable for you under 'In other words...' Then under each flap, write 2 real world examples of each law and draw a picture to accompany your example. One example can be from the reading passage, but try to come up with a second one on your own. Last, respond to the writing prompt and add any other information your teacher instructs.

Newton's First Law of Motion

What it says:

In other words....

Newton's Second Law of Motion

What it says:

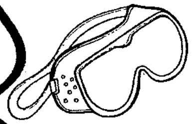
In other words....

Newton's Third Law of Motion

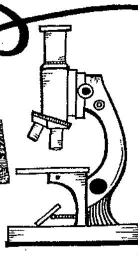
What it says:

In other words....

Choose one of Newton's Laws of Motion. Explain what it is and how it is evident in our daily lives.



the scientific method



I can use the scientific method to conduct an experiment.

Purpose
State the problem

Research
Find out about the topic

Hypothesis
Predict what will happen during the experiment

Experiment
Do an experiment that tests your hypothesis

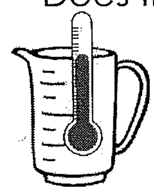
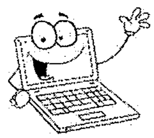
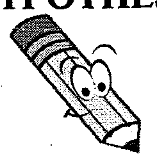
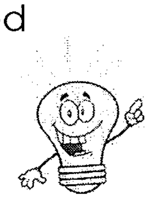
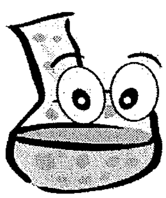
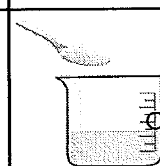
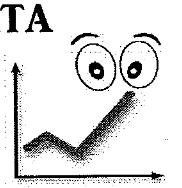
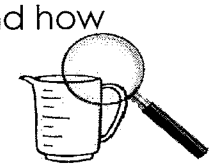
Analysis
Record your results and look at your data

Conclusion
Decide if your hypothesis was correct

Name____________________________

SCIENTIFIC METHOD SORT–ANSWERS

Cut and paste the steps, description and examples and place into the correct box of the Scientific Method below.

STEP	DESCRIPTION	EXAMPLE
DEFINE THE PROBLEM 	Ask a measureable question you want to solve.	"Does the temperature of water change how much sugar will dissolve in it?" 
BACKGROUND RESEARCH 	Find out as much as you can about your problem and list the materials you will need.	Look up facts about sugar to see how well it dissolves in water, and if there are any special procedures for dissolving sugar in water. 
WRITE A HYPOTHESIS 	Make a prediction about what will happen in your experiment	Make an educated guess that more sugar will dissolve in the water if it is hotter. 
EXPERIMENT 	Design a test or procedure to find out if your hypothesis is correct.	 Prepare 3 different beakers of water at different temperatures. Add sugar to each of the beakers until no more will dissolve stirring at the same speed.
ANALYZE DATA 	Record what happened as data during the experiment.	Measure and record how much sugar was left in each container, to find how much sugar was added to each beaker. 
DRAW A CONCLUSION 	Summarize the findings of your experiment to determine whether the experiment proves or disproves your hypothesis.	 Use this data to find that more sugar does dissolve if the water is hotter.

Name____________________________

SCIENTIFIC METHOD SORT

Cut and paste the steps, description and examples and place into the correct box of the Scientific Method below.

STEP	DESCRIPTION	EXAMPLE