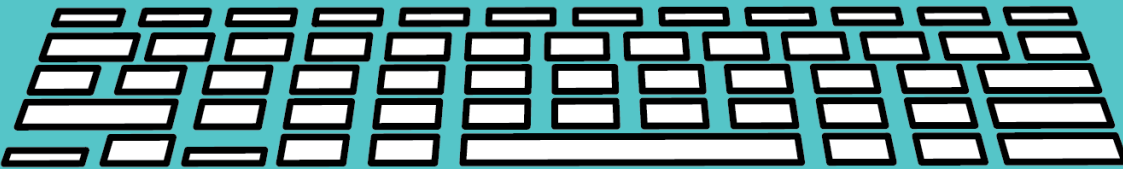


INFORMATIONAL
ENERGY IS
STORED
ENERGY
WAITING TO
BE RELEASED

Short Answer	Type Answer Here
1. What is the word for when you travel and move?	
2. How many kinds of contact forces are there?	
3. Newton developed how many laws of motion?	
4. What measures the required force to speed up objects?	
5. Earth circling the sun is an example of what force?	
6. What was Newton's first name?	
7. Suspension bridge is an example of what type of force?	
8. How many different kinds of forces are there?	



Short Answer	Type Answer Here	Fill in the Blank	Type Answer Here
1. What is the word for when you have and ...		9. Motion is ____ in any direction.	
2. How many kinds of contact forces are there?		10. Kicking a ball is an example of ____ force.	
3. Newton developed how many laws of motion?		11. There must be a ____ to move something.	
4. What measures the required force to speed up objects?		12. ____ is when two objects do not connect.	
5. Earth circling the sun is an example of what force?		13. ____ is when two objects rub against each other.	
6. What was Newton's first name?		14. ____ is the amount of matter in something.	
7. Suspension bridge is an example of what type of force?		15. ____ is the push or pull of an object.	
8. How many different kinds of forces are there?		16. To stay in place and move is ____ movement.	



FORCE AND MOTION

Why does a ball stop when you let go of it? Why doesn't a top spin forever? The great questions deal with the laws of motion and force. Motion is movement in any direction, including forwards, backwards, up, down, sideways, or circles. Motion can be in a straight line, which is called locomotion. Examples include a car, a wheel, a person jumping, etc. You can always stay in place and move, called movement. Movement examples are being a pivot, spin, etc. Other examples of movement are with objects. For instance, a waterfall or a river.

There must be a force acting on the object. Force is the push or pull of an object. For example, motion with a lawnmower, snow blower, someone on a swing, a roller coaster, etc. Pulling examples include a horse pulling a carriage, a person pulling a door or curtain.

Forces can be small or large to make something move, speed up, slow down, change direction, stop an object, or change shape. The amount of force needed to affect something varies. Imagine you have a box filled with feathers and a box filled with rocks. Which box would be easier to push, carry, or pull? The box with feathers would be easier because the mass is smaller. Mass, measured in kilograms (kg), is the amount of matter in something. Feathers have more mass than feathers.

What happens if you have two identical wagons filled with mulch. An adult pulls one wagon, and an 8-year-old pulls the other one. Which person would have more success? The adult would have more success and ease pulling the wagon. Why? Because the amount of force impacts the speed at which something will move. An adult pulling the wagon has more power, energy, and force than an 8-year-old.

How do you stop or slow down a heavier or faster moving object? How does that compare with stopping or slowing down a lighter or slower-moving item? More force is required to stop or slow down the heavy and fast object.

There are two kinds of forces: contact force and field force. Contact force occurs when two objects connect. Examples of contact forces include:

- Kicking a ball
- Sanding wood (sandpaper on wood).
- Stretching a spring

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- Flying a kite (wind)

Field force is when two objects do not connect. They can be far apart to create a push or pull. Field forces are also called non-contact or distant forces. Examples of field forces include gravity, magnetism, and electrical forces. An apple falls from a tree (instead of floating upward) due to gravity pushing down. Likewise, paper clips stick to a magnet because of the magnetic force.

There are six kinds of contact forces:

- Frictional force - friction is when two objects rub against each other. The less friction there is, the better something will move.
- Tension force - tension force involves a string, cable, or chain that affects an object.
- Normal Force
- Air Resistance Force
- Applied Force
- Spring Force

Force is the interaction between objects. If something moves, something is applying force. Force changes the state of an object, either by its physical appearance or the way it is moving.

Sir Isaac Newton developed the three laws of motion in the late 1600s. Newton's first law states that an object remains the same until a force affects it. Things that are still, stay still, and things in motion stay in motion. In other words, an object in motion will remain in motion until a force affects its speed or direction. Likewise, an object remains at rest until a force moves it. Newton's second law states that heavier objects need more force to make them move. Newton's third law of motion states that every action has an equal and opposite reaction.

Scientists measure force in a unit measure called a newton. Can you think of why it is called a newton? Newton measures the required force to speed up (accelerate) objects.

A bow and arrow, an apple falling from a tree, and bouncing a basketball all demonstrate types of force. There are many types of force and turning force, too. Turning forces can be used to make an object move in a straight line, requiring a lot more energy. A wheel is an example of a turning force would be the earth circling the sun. Suspension bridges have opposite forces that keep objects stable. For instance, a suspension bridge uses large cables with force pulling upward to offset the gravity force pushing downward.

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