Science

Q:Are there different types of force and motion?

A • "Red Rover! Red Rover let Jesse come over!" Young students are familiar with the observable effects of force and motion but may not have considered the many varieties demonstrated in simple ways every day on the playground.

Pushing and Pulling

A *force* is simply a push or a pull. A force can make an object move, move more quickly, change direction, slow down, or stop. Forces cannot be seen but their effect can be felt. When the push or pull results in movement, *motion* is observed.

To make an object move, a force must be exerted on the object. At recess, a simple game of catch is started using *muscular force*. If the ball isn't caught it will not stay in the air forever. *Gravity* is the force that causes the ball to slow down and fall to the ground.

Forces of Resistance

Friction is a force that resists motion by either being too great to get the

motion started or by slowing an object down. Machines often use engines or stored energy, e.g., batteries or wound elastic bands, to overcome friction and/or keep an object moving.

A certain amount of friction is needed to keep us from slipping and sliding. This is evident when comparing how easy or difficult it is to stop on different surfaces. On the playground, students can witness various levels of friction when sliding down a slide. If students have different treads on their shoes, they can investigate which tread creates the greatest amount of friction on the ground or sidewalk.

Types of Motion

Mechanisms, such as levers, pulleys, or gears, can change one type of motion into another. Being able to recognize different kinds of motion linear, rotational, reciprocating, and oscillating—helps one determine the correct type of mechanism needed to change the motion.

Linear motion is movement in a straight line, such as a bicycle or car moving along a road. Rotational movement is movement in a complete circle, such as a bicycle wheel spinning. Oscillating movement is movement backward and forward in part of a circle, such as a pendulum. *Reciprocating* motion is movement backward and forward in a straight line, such as a saw sawing.



Keywords: Simple Machines at www.scilinks.org Enter code:SC030402

Forces make objects move and can change how fast something is moving as well as the direction it is moving. Simple machines can help increase or decrease the amount of force being applied and can change one type of motion into another type or amplify or reduce a particular type of motion.

The World in Motion

The various types of motion are visible all around us: a bicycle, a yo-yo, a slinky, and an amusement park ride are some fun examples. Motion can be simple or complex: The key is to provide children with the skills to describe, predict, and apply motion knowledge to help them understand the world around them.

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> Send your questions to *s&c@nsta.org* with the subject line "Science 101."



Joanne Harris with her students in Ontario, Canada.