

Mr. Alexander
Technology Education

Physical Science in Action Series

Simple Machines

Vocabulary

Vocabulary

work — Motion of an object that results from the use of force over a distance. The formula to calculate work is: $\text{work} = \text{force} \times \text{distance}$.

force — A push or pull on an object causing a change in motion.

effort force — The force exerted to do work.

resistance force — The push or pull on an object that works against effort force. Gravity and friction can be considered resistance forces.

simple machines — Devices used to reduce the effort force needed to do work by spreading that force over greater distance and/or reducing resistance forces.

lever — A simple machine that consists of a rigid bar turning on a fixed point called a fulcrum. Downward motion at one end results in upward motion at the other end.

fulcrum — The fixed balancing point of a lever. An example of a fulcrum is the middle bar in a see-saw.

mechanical advantage (MA) — The number of times that a machine multiplies the effort force. The greater the MA, the less effort force is required.

wheel-and-axle — A simple machine that applies force to a fixed bar called an axle, which is attached to a wheel. This force is multiplied and enables a wheel to move a greater distance with less effort.

pulley — A simple machine consisting of a cord or rope wrapped around a grooved wheel that can turn to reverse the direction of a force. Pulleys are used in combination to increase applied force in order to make work easier.

block and tackle — A compound machine consisting of fixed and movable pulleys.

inclined plane — A simple machine that uses a ramp to reduce the effort force by increasing the distance. A wedge and a screw are examples of movable inclined planes.

wedge — A simple machine that tapers to a thin edge and can be used for splitting wood and rocks and raising heavy objects.

screw — A simple machine consisting of a central core with a groove wrapped around it.

compound machines — A machine in which two or more simple machines have been combined. Pliers are an example of a compound machine that uses a lever and a wheel-and-axle.