

Simple Machines Study Guide

www.ccs.us/~ekahl

<http://www.edheads.org/activities/simple-machines/index.htm>

Vocabulary:

1. Force: any push or pull
2. Gravity: the attraction or pulling force between objects and the Earth.
3. Friction: the force that slows down or stops objects in motion
4. Simple machine: a machine with few or no moving parts. There are six: lever, screw, wheel and axle, pulley, inclined plane, and wedge. Simple machines will either change the size of the effort force or the direction of the effort force.
5. Compound machine: a machine made of two or more simple machines.
Examples
6. Include a can opener, a bulldozer, an elevator, etc.
7. Fulcrum: the fixed point, or point that doesn't move on a lever; the point where a lever rocks back and forth and rest upon. Examples: the center of the seesaw is the fulcrum; when opening a can with a can opener the rim is the fulcrum; using a crowbar to remove a nail, then the wood where the bar rest is the fulcrum; the wheel on the wheel-barrow is the fulcrum.
8. Screw: an inclined plane wrapped around a post; it's used to hold things together.
9. Wedge: a machine made up of two inclined planes pieced back-to-back; two inclined planes together; it is wide at one end and pointed at the other. It is used to split, cut or push things apart.
10. Energy: the ability to do work
11. Work: that which is done on an object when the force moves an object through a distance; occurs when a force moves an object over a distance; examples, running; kicking a ball, moving furniture, the wind pushing a sailboat, etc. No work is being done sitting still watching TV, pushing against something that won't move, etc.
12. simple machine – one of the basic machines that make up other machines
13. lever – a simple machine made up of a bar that turns around a fixed point
14. effort force – the force put on one part of the bar when you push or pull on a lever
15. pulley – a simple machine made up of a rope or chain and a wheel around which the rope fits
16. wheel and axle – a simple machine made up of a large wheel attached to a smaller wheel or rod; It will increase the effort force.
17. inclined plane – a flat surface with one end higher than the other, work is done over a greater distance.

Concepts

- The amount of force needed to move an object depends on the object's mass. Heavier things require more force to move them than lighter things do. Dragging or pulling a heavy object takes less force than lifting it.
- Rough surfaces cause more friction than smooth ones. Rough surfaces can be smoothed out by adding water, oil, or soap to the surface.
- Friction is needed to do most activities safely. For example, tires with heavy or deep tread stop more easily on snow and slush than do smooth tires. We couldn't even walk without the aid of friction, or drive, or run.
- To decrease the amount of force needed to lift a load with a lever, move the fulcrum closer to the load.
- The longer the inclined plane is, the less steep it is. The less steep it is, the less force is needed to move an object up it. But the less steep it is, the longer the distance is to be traveled.
- Be able to tell which simple machines are in common household items. For example, a doorknob is a wheel and axle. An ax is a wedge and a lever.