

Simple Machines

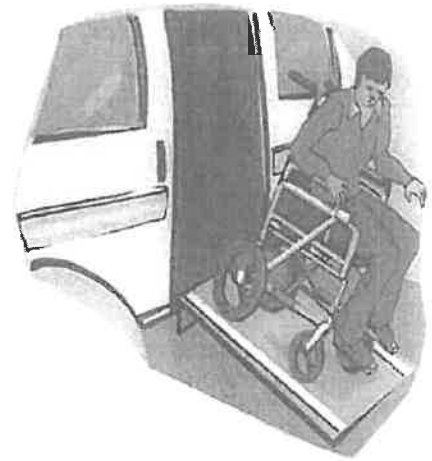
Machines don't always have to be complicated, in fact we use simple machines everyday. They help us lift, pull, transport, and hold objects together. Without these very basic machines our lives would be a whole lot harder.

Amp Up Your Ramp - *Inclined Plane*

Imagine trying to carry a heavy box up a ladder. It would probably be difficult and even dangerous. But if you were to place a long sheet of plywood on the ladder and push the box up, even though the distance is longer, the effort it takes is less.

An inclined plane or ramp is used daily by many people, you may have seen a delivery truck with it's long ramp loading or unloading products. Most buildings today also have an inclined plane for people using wheel chairs.

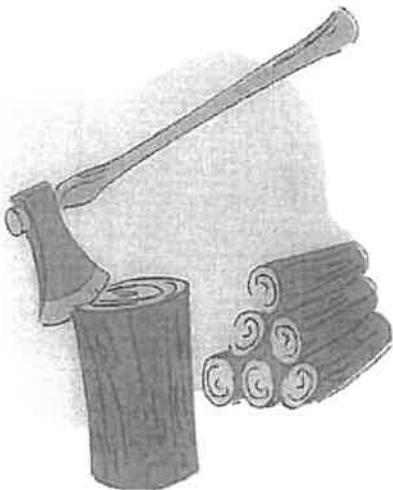
Ladders and stairs are also sloped to make an inclined plane. The bottom of your bathtub is also an inclined plane because it is sloped to force water toward the drain.



Get the 'Wedge' Edge

What has at least one slanting side and ends in sharp edge? A wedge. A wedge works like a ramp, but instead of moving an object from here to there, it pushes it apart. The narrower the wedge is the easier it is to divide something.

Wedges can be sharp like axes, knives or shovels, or they can be round like the tip of a nail or the tines of a fork. Just imagine how difficult it would be to eat dinner without the help of a knife to cut your food or a fork to pick it up with.



Simply Screw-ie

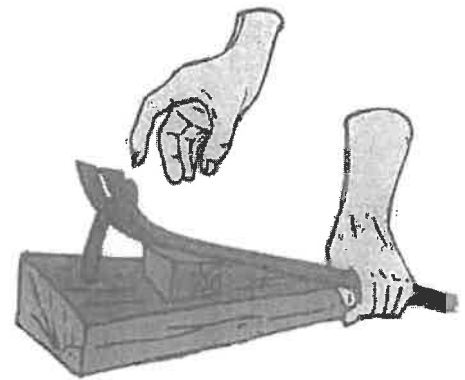


Who would've thought a simple screw would be considered a machine, but it is. Screws hold things together and are used in our daily lives. What makes a screw, a screw? The inclined plane that wraps around it, called a thread, and the wedge on the end.

Look at an example of a screw (jars, bottles and their lids are considered screws), if the thread is wide it will be harder to turn, but if it's narrow it will take longer to fasten.

The Eager Lever

Levers are always ready to work and it's a good thing as they are able to help us lift heavy objects. It's easy to recognize a lever - most things with a handle attached are considered one. Levers consist of a stick and a fulcrum (*fuul-kruh-m*). The fulcrum is the point at which the lever moves. By changing the position of the fulcrum you will either gain or lose power - the closer the fulcrum is to the object the easier it is to lift. Good examples of levers are seesaws, shovels, and crow bars.

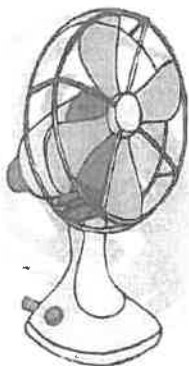


The Wheel Deal

The wheel and axle are one of the oldest, simple machines around. In fact a wheel was found dating back 5,500 years. A true simple wheel and axle machine consists of a rod (axle) secured to a wheel.

A water faucet has a wheel and axle on it. The knob that you turn is the wheel. When you turn the knob, you are also turning an axle that it's attached to.

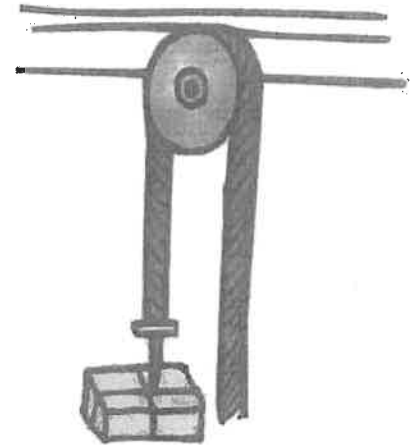
A fan is another example of a wheel and axle. The fan blades (wheel) are attached to a rod (axle). When the motor is turned on, the fan blades will spin and produce a nice cooling breeze on a hot day.



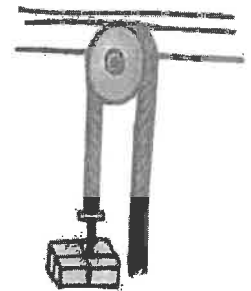
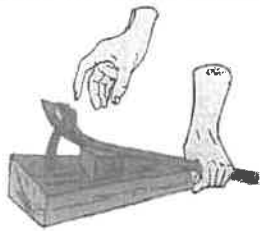
Pull That Pulley

Take a wheel with a groove running around it add an axle and a rope or cable, put them together and what do you have? A pulley.

When you work with a pulley, lifting becomes a cinch. Why? Because you're working with gravity by pulling down on the rope. Imagine raising a flag to the top of the pole without a pulley. How would you do it? You could take a ladder and climb to the top and fasten the flag. You could use a ramp and push it to the top. Or you could simply attached it to a pulley and hoist away. Letting pulley's do the job is safe, simple and fun!



Simple Machines



1. What type of simple machine is found on a water bottle cap?

- a. lever
- b. pulley
- c. wheel and axle
- d. screw

2. How is a wedge like an inclined plane? How is it different?

3. On which type of simple machine would you find a fulcrum? Explain what a fulcrum is.

4. Which is an example of a wheel and axle?

- a. shovel
- b. water faucet knob
- c. seesaw
- d. crow bar

5. What type of simple machine is shown in the picture to the right?

- a. inclined plane
- b. pulley
- c. wheel and axle
- d. wedge



Simple Machines

Choose the best answer for each multiple choice question.
Write the best answer on the line.



_____ 1. Which is **not** a type of simple machine?
a. spring b. screw
c. pulley d. wedge

_____ 2. Work is...
a. energy from the sun b. a force that moves an object
c. a type of machine d. a force that pulls you towards the Earth

_____ 3. What type of simple machine is found on the cap of a pickle jar?
a. lever b. inclined plane
c. screw d. wheel and axle

_____ 4. What is the fixed point upon which a lever rotates?
a. fulton b. fulcrum
c. furmen d. falcon

_____ 5. What type of simple machine is found on the floor of a bathtub?
a. screw b. inclined plane
c. wedge d. pulley

_____ 6. Which of these is an example of a wedge?
a. skateboard b. broom
c. stairs d. butter knife

_____ 7. A screw is made up of _____ wrapped around a post or rod.
a. treads b. springs
c. threads d. strings

- _____ 8. Which of these is **not** an example of an inclined plane?
- a. ladder
 - b. stairs
 - c. wall
 - d. driveway
- _____ 9. Which is an example of someone using a simple machine to do work?
- a. a boy runs across a football field
 - b. a banker counts money
 - c. a mother pushes a stroller up a ramp into a building
 - d. a girl eats a sandwich
- _____ 10. Jan is using a screwdriver to insert a screw. The screwdriver is being used as...
- a. a pulley
 - b. a screw
 - c. a lever
 - d. a wheel and axle
- _____ 11. Thomas is using a screwdriver to pry open a paint can. The screwdriver is being used as...
- a. a pulley
 - b. an inclined plane
 - c. a screw
 - d. a lever
- _____ 12. Which is a characteristic of simple machines?
- a. They run on electricity.
 - b. They take a long time to make.
 - c. They have few or no moving parts.
 - d. They are not very large.
- _____ 13. Which type of simple machine would be found on the bottom of a wagon.
- a. a pulley
 - b. a screw
 - c. a wedge
 - d. a wheel and axle
- _____ 14. What two parts might make a pulley?
- a. wheel and axle
 - b. wheel and wire
 - c. wheel and screw
 - d. wheel and fulcrum

