

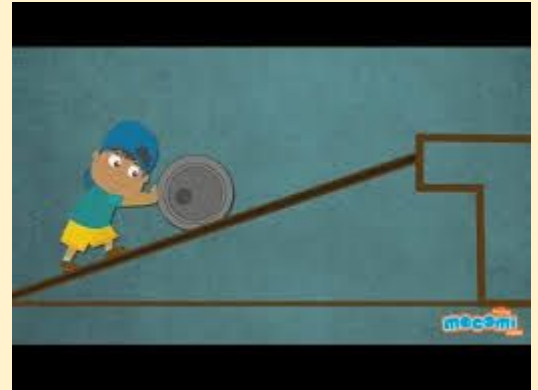
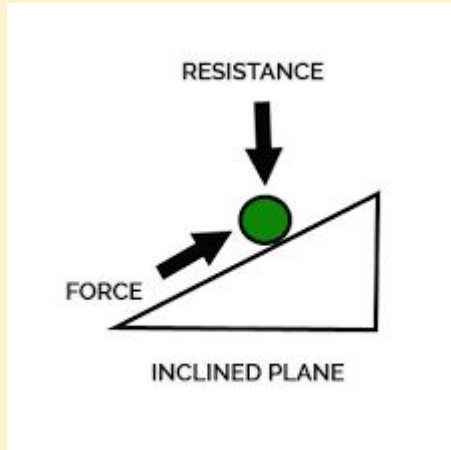
Simple Machines



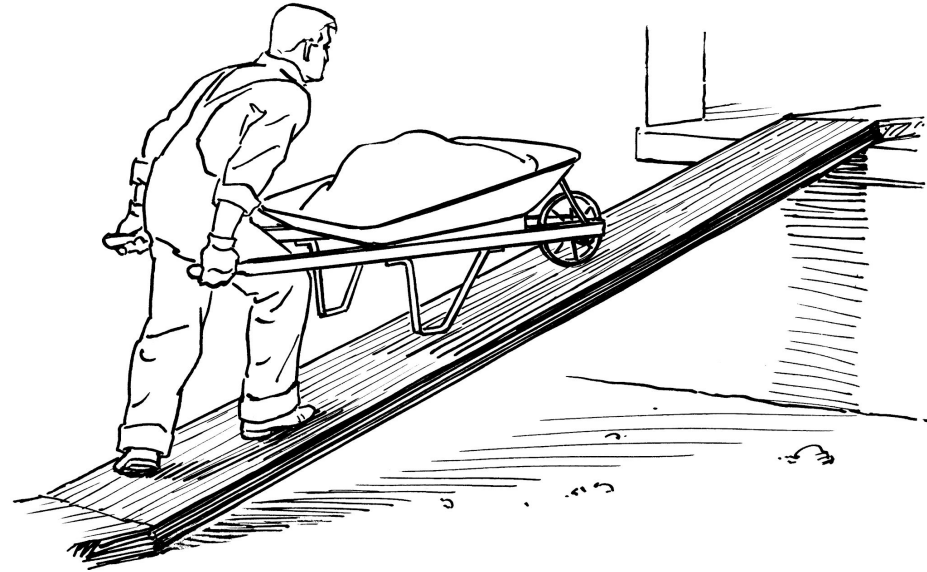
Simple Machines Make Work Easier!

Inclined Plane

An inclined plane is a ramp. It helps you move something from a lower place to a higher place or a higher place to a lower place.



INCLINED PLANE - Real Life Examples

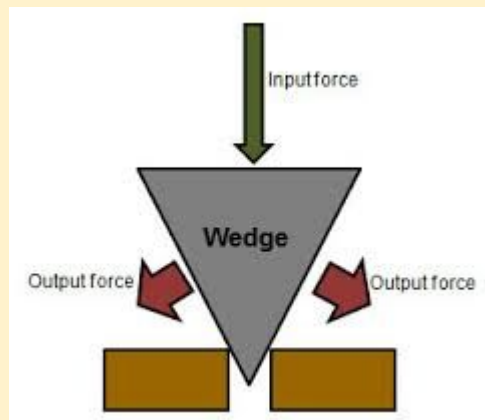
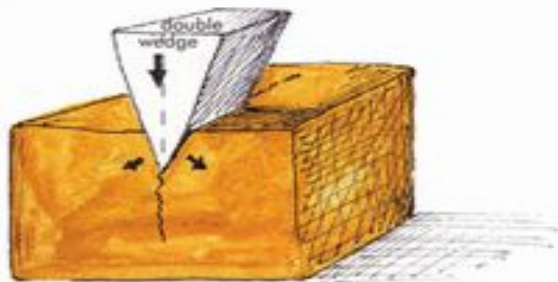




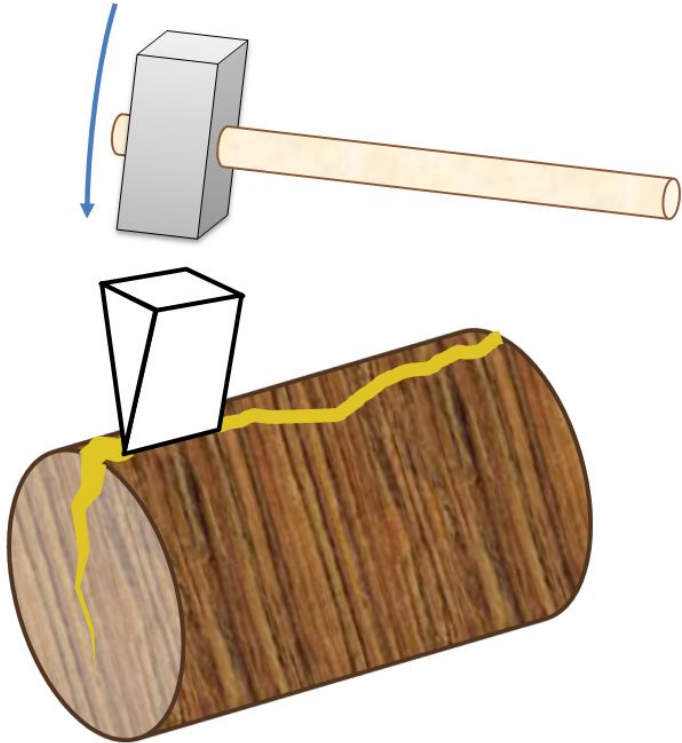
Wedge

A **wedge** is a triangle shaped machine. It can be used to stop or hold things in place. When a wedge is pushed under a door, the diagonal edge pushes up against the bottom of the door and holds it still. A **double-wedge** is also triangle shaped, but it is used to split wood or separate things. When the triangle is pushed down, its two sides push out diagonally.

*A door stopper is one example of a wedge,
and an axe is one example of a double-wedge.
Can you think of any others?*



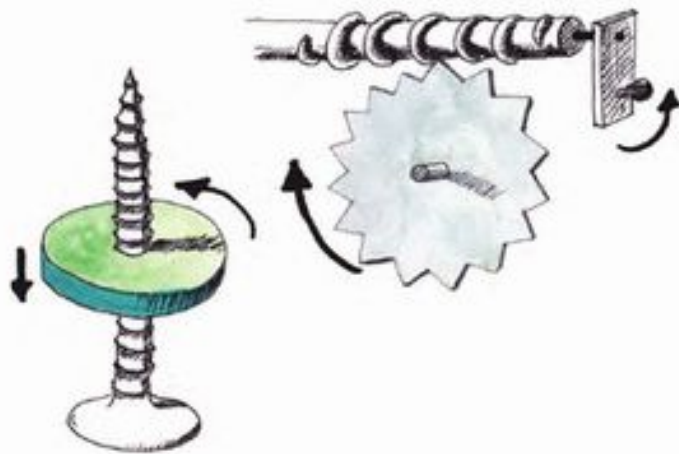
WEDGE - Real Life Examples



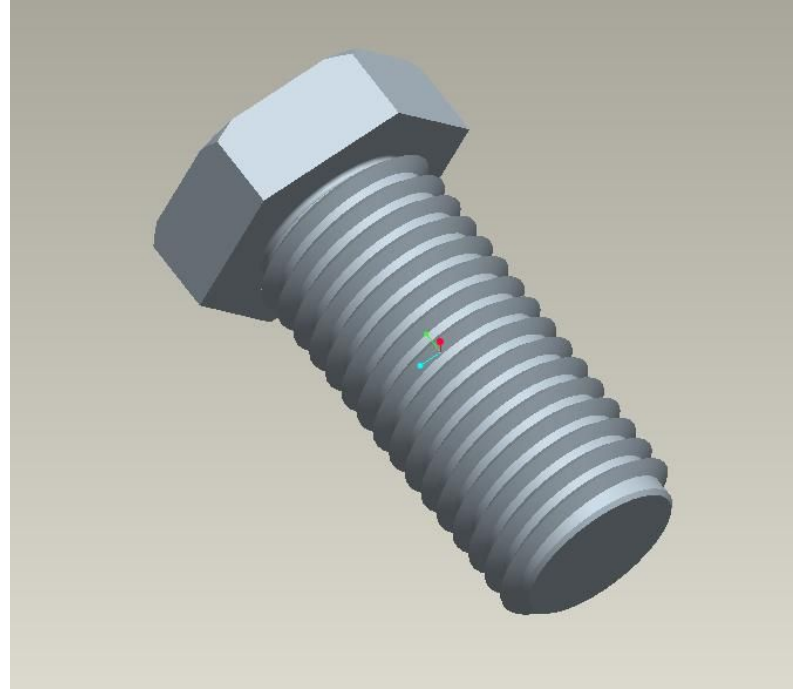
Screw

A **screw** is a cylinder with threads spiraling down it. A screw turns a twisting motion into straight motion. When a screw is turned into wood the wood is moved up or down in a straight line along the screw and is stopped by the head.

A corkscrew is one example of a screw. Can you think of any others?



SCREW - Real Life Examples



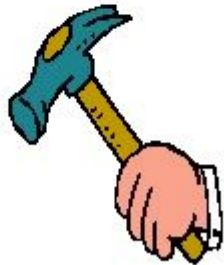
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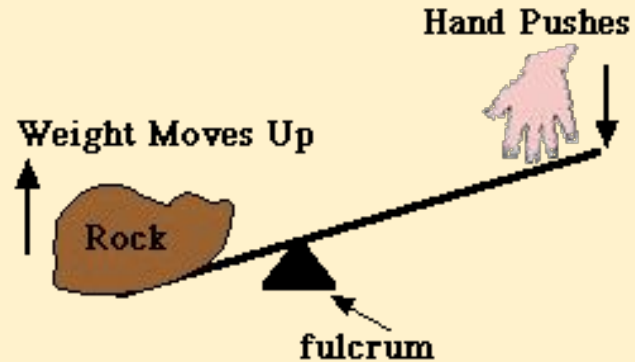
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Lever

A lever is a board or bar that rests on a turning point. This turning point is called the fulcrum. An object that a lever moves is called the load. The closer the object is to the fulcrum, the easier it is to move.



Page 1



LEVER - Real Life Examples



LEVERS!

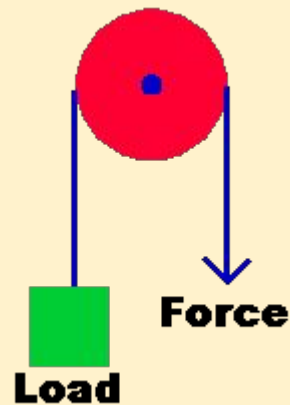
Sci From Kids!



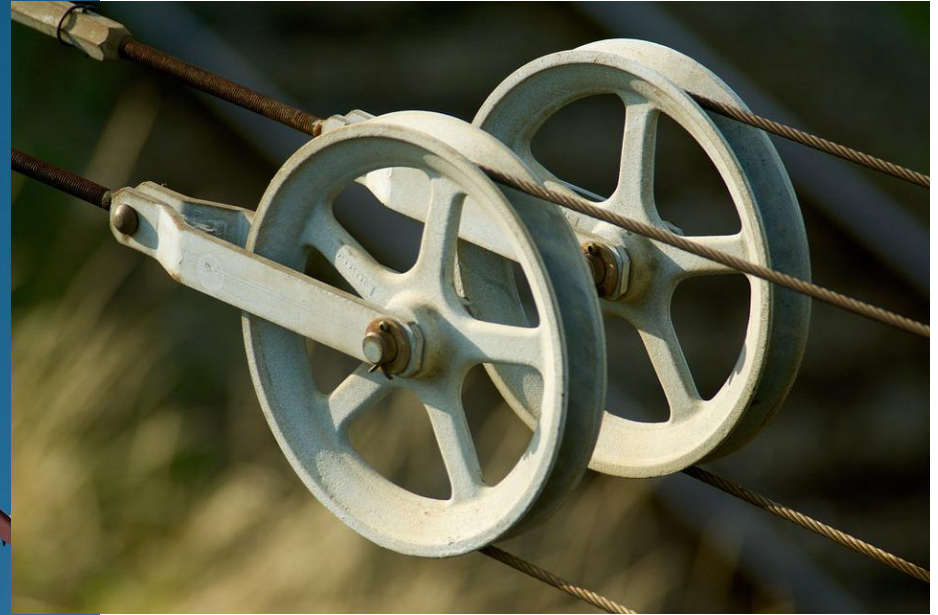
Pulley

A **pulley** is a simple machine that uses a rope over something round, usually a wheel, or a tree branch or whatever works. When one side of the rope is pulled down, the other side goes up. The direction of movement is changed, and the item is easier to lift.

A *flagpole* is one example of a pulley. Can you think of any others?



PULLEY - Real Life Examples

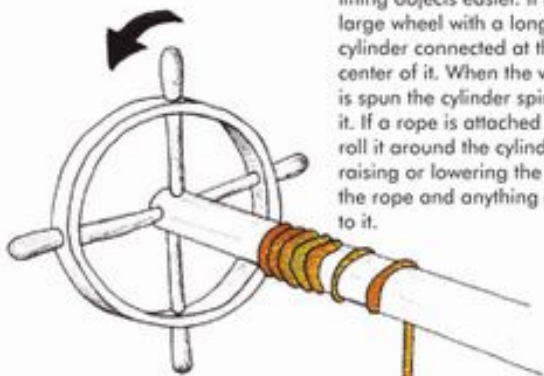


PULLEYS!



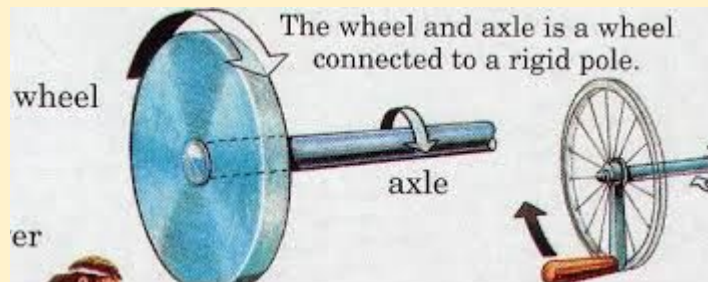
Wheel & Axle

The **wheel and axle** is a machine used to help make lifting objects easier. It is a large wheel with a long cylinder connected at the center of it. When the wheel is spun the cylinder spins with it. If a rope is attached it will roll it around the cylinder, raising or lowering the end of the rope and anything attached to it.



Today, the wheel and axle is used for many different things.

A doorknob is one example of a wheel and axle. Can you think of any others?



The wheel and axle is a wheel connected to a rigid pole.

wheel

axle

er

WHEEL & AXLE - Real Life Examples



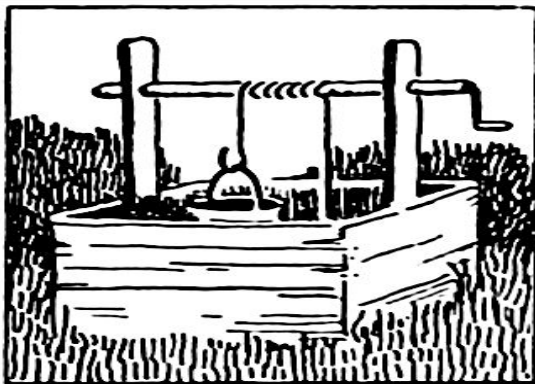
LET'S GET
ROLLING!

Sci Kids!

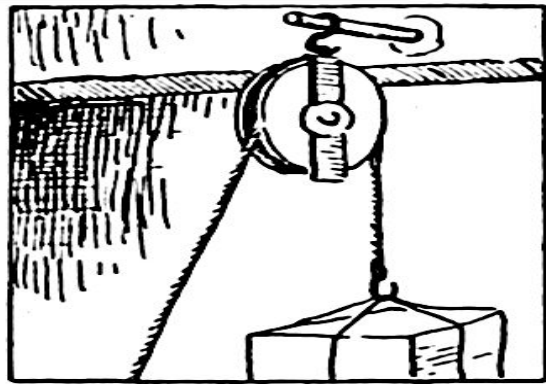




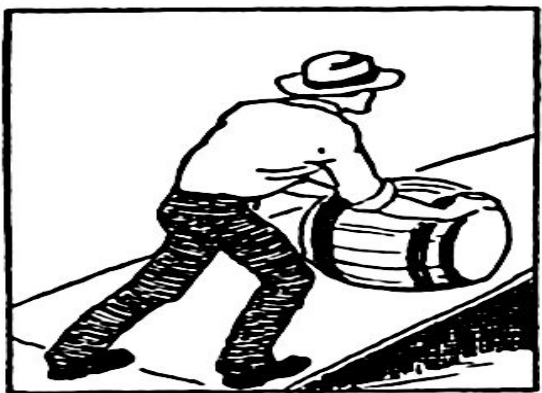
Lever



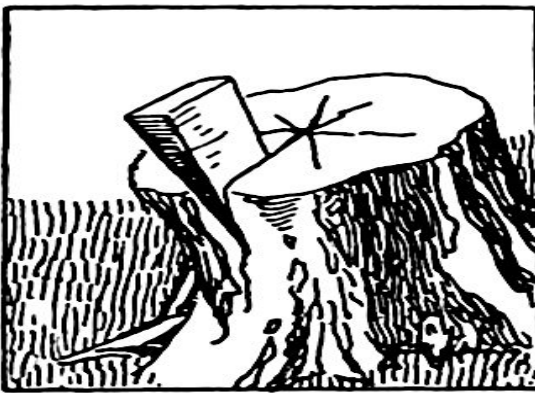
Wheel and axle



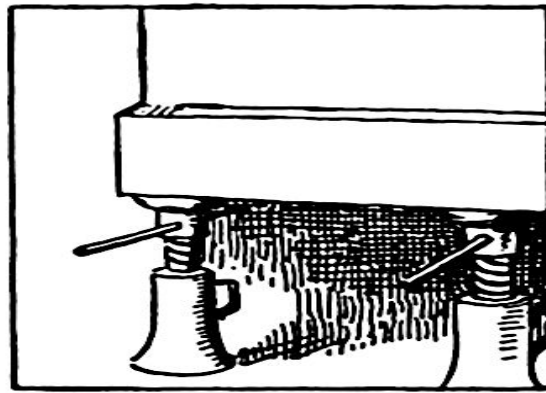
Pulley



Inclined plane



Wedge



Screw



two
kids

FULL EPISODE



Simple Machine Scavenger Hunt



What things can you find around your house that are an example of a simple machine?

Inclined Planes	Wedges
Pulleys	Levers
Screws	Wheels and Axles

Inclined Planes

A ramp is an **inclined plane**. It connects a lower place to a higher place. Inclined planes make lifting easier. They are simple machines.

A heavy box can be moved up a ramp and into a truck. Ramps can also help move objects down.

It is difficult to lift a box straight up. Pushing the box up an inclined plane is easier.



There Are Many Inclined Planes

Cars drive on inclined planes to get to a bridge. Playground slides are inclined planes. A ramp for wheelchair users is an inclined plane.

"Inclined Planes"—Think About It!

1. A _____ is an inclined plane.
2. How does a ramp help furniture movers?

3. Draw a picture of an inclined plane. Explain how it makes work easier.



Wedges

A wedge is made from one or two inclined planes that end in a sharp edge. The sharp edge is used to cut things apart.

Wedges at Work

Wedges are simple machines. They make work easier.
Wedges can do different things.

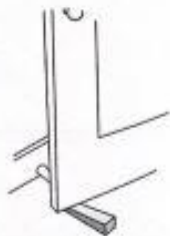
An axe is used to split wood.



The blade of a knife is a wedge.
It is used to cut food.



A doorstop is a wedge. You slip it under
a door to stop it from closing.



"Wedges at Work"—Think About It!

1. A wedge is made of one or two inclined planes ending in a

_____.

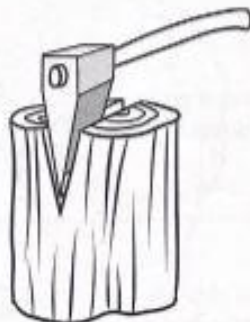
2. An axe is a wedge. It is used for _____.

3. A knife blade is a wedge. It is used for _____.

4. A doorstop is a wedge. It makes the door _____.

5. Think about wedges in your home. Give an example.

6. How does a wedge make work easier?

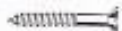


Screws

A **screw** is an inclined plane twisted around a rod. Screws can join, cut, lift, or push. Screws make work easier. They are simple machines.

Uses of Screws

Builders attach wood with screws.



Jars have lids that screw on. The screw shape holds the lid tight on the jar.



A jack lifts a car so you can change a tire. The jack uses a large screw.



A twirling piano stool uses a screw. The seat twirls up and down.



Drill bits are shaped like screws to make holes in materials such as wood.



"Screws"—Think About It!

1. A screw is an _____ plane twisted around a _____.

2. Screws make work easier. List three examples.

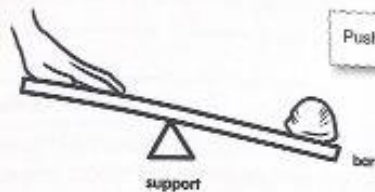
3. Think about screws at home. Give an example.

4. How does a screw make work easier?



Levers

A lever is a simple machine. It moves a load. A load is the thing being moved. A lever is a bar. It balances on a support. Moving the support changes how much effort is needed.



Push down on the lever to lift the rock up.

Sometimes the support is in the middle of the lever. A see-saw in the park is a lever. The support on a see-saw is in the middle.

Sometimes the support is close to one end. A wheelbarrow is this type of lever. The wheel is the support. You pull up on the handles of a wheelbarrow. Moving a heavy load is easier in a wheelbarrow.



"Levers"— Think About It!

Define the following words.

1. lever _____

2. load _____

3. support _____

4. What type of lever would you use to move a load of dirt?

5. What lever can you find in the playground?

6. Name a lever you use to a play sport.

Did You Know?

Hockey sticks and baseball bats are levers. Your hands are the support for both of these levers.

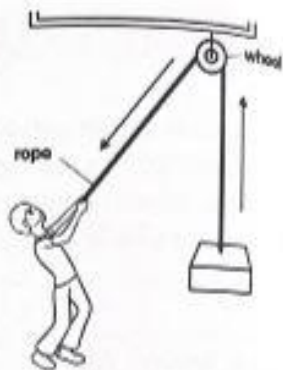
Pulleys

A **pulley** is a simple machine that can lift and lower or move a load. A pulley has two parts. One part is a wheel with a groove around the outside. The other part is a rope or chain.

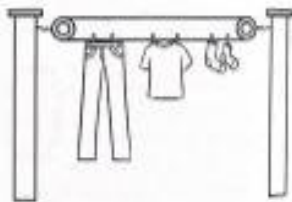
It is difficult to carry a heavy box up a set of stairs. A pulley can help you move the box up. It can also help you lower a box.

You can raise and lower windows blinds with a pulley.

Outdoor clotheslines have pulleys at both ends.



You pull down on the rope to lift the box.



1. What is a pulley?

2. Circle the examples of a pulley.

- A. knives and hammers
- B. flagpoles and clotheslines
- C. paper and pencils

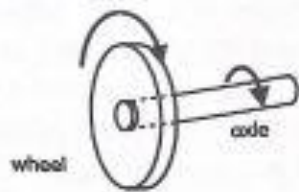
3. Circle the two parts of a pulley.

- A. wheel and axle
- B. handle and bucket
- C. wheel and rope

4. How do pulleys help us?

Wheels, Axles, and Pulleys

Wheels move people and things. A wheel can be attached to a rod called an axle. The wheel moves or spins on the axle. A **wheel and axle** is a simple machine.



The wheel turns around the axle.

Wheels Around You

Wheels and axles help things move. Cars, trucks, and bicycles all have wheels and axles. The axles turn the wheels.

A doorknob is a wheel and axle. You turn the wheel (the doorknob). This turns the axle.



Wheel and Axles

A wheel and _____ is a simple machine made up of a _____ attached to a bar or _____ called an axle. By turning one, the other also _____. A wheel and axle is used to _____ things, or change the power, _____ or direction of movement.

wheel

turns

rod

speed

axle

move

In the space below draw at least three things that use a wheel and axle system to move.

Match the Simple Machine

Match each simple machine to a description.

screw

made up of two parts—a circle and a rod

lever

used to fasten or drill

pulley

can lift a heavy load by pushing on it

wheel and axle

can be used for splitting things

wedge

looks like a ramp

inclined plane

pull down on a rope to make a load go up

STEM Activities

Below find a variety of simple machine activities you can do if you would like.

Inclined Plane Activity

- Build/make an inclined plane to use with the car you constructed for a wheel and axle, or to use as a car ramp with any toy vehicles.
- Try placing the incline at different levels and see which one is easier/harder to push or pull an object up

Screw and Wedge Activity

With an adult use a screwdriver to practice screwing in screws to a thick piece of cardboard, or even a piece of wood. Or to test out a wedge, use a nail and a hammer (or a golf tee and a toy hammer).

Here are some more examples of a screw being used, with items you may have around the house!

Bottle opener: turns into the cork, to take the cork out	Pliers: lets the teeth open and close	Tap: turn it to let water turn on or off
Saw: attaching the handle to the saw		
Vice grip: screw it tight to hold objects	Door knob: screws hold the knob to the door	Scissors: lets the blades open and close

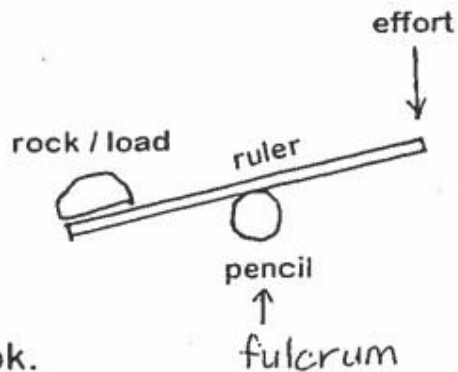
Lever Activity

Let's see how levers make lifting easier

1. Place your ruler on the pencil
So that both sides are equal.
Place your rock on one end.
Push down on the other end.

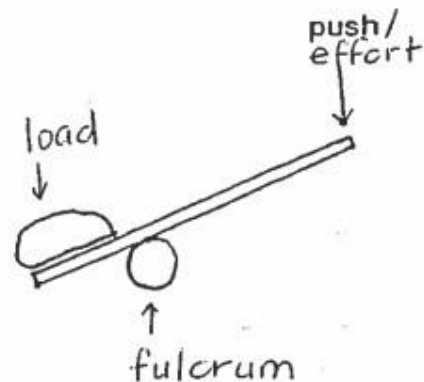
Does it take effort? Yes No

Now remember how much effort it took.



2. Place your ruler so that most of
the ruler is on the right side of
your pencil. Place your rock on
the shorter left side. Push down
on the right end.

Did it take more or less effort _____



Cereal Box Pulley

Materials: cereal box, scissors, pencils or sturdy sticks, yarn/string, tape, something small for the “load” (ie.lego man, eraser)

- ❑ Draw a rectangle on one side of the cereal box.
- ❑ Cut it out.
- ❑ Once it is cut out, fold it into a rectangular prism shape with open ends.
- ❑ Before taping the prism shut, take a piece of yarn/string and tape the two ends inside the prism. Now, tape it shut.
- ❑ Take another piece of string/yarn that is 3x the height of the box and knot it around the string/yarn that is through the prism.
- ❑ Mark 2 X's on either side of the top of the box. Poke holes through and slide 2 pencils in and out the opposite side.
- ❑ Trace a cut a square out on the side of the cereal box.

- ❑ Put the prism inside the box. Take the string/yarn and weave it through the pencil using an over/under figure 8 method. Start on the side of the square.
- ❑ Pull the string/yarn through the empty hole.
- ❑ Put a load in the prism.
- ❑ Lift your load.



Wheel and Axle Car

- Using recyclable materials, build a vehicle that uses a wheel and axle
- Race your vehicles or give it a push to see how far it will go!

