

Simple Machines Journal

Simple Machines help people do work.

Simple Machines do work with one movement.

There are six types of Simple Machines: the Inclined Plane, the Wedge, the Screw, the Lever, the Pulley, and the Wheel & Axle.

Student: _____

Teacher: _____

Date: _____

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Exploring Inclined Planes

[\(Simple Machine Websites\)](#)

What is an Inclined Plane?

An **Inclined Plane** is a simple machine that is used to make it easier to raise objects or people. It is easier to move things on the sloped, flat surface of an **Inclined Plane** rather than move them straight up and down. Sometimes **Inclined Planes** are not flat like in ramps and steps. Screws and wedges are special kinds of **Inclined Planes**.

How does an Inclined Plane help us?

An **Inclined Plane** makes work easier for us because it reduces the amount of force needed to move an object. When you move an object up or down an **Inclined Plane**, you travel a longer distance than if you moved the object straight up or down.

-A long, gradual inclined plane = easier to move things up so less effort!

-A short, steep inclined plane = harder to move things up so more effort!

List 4 or more examples of Inclined Planes in our everyday lives.

Examples of Inclined Planes

- 1.
- 2.
- 3.
- 4.
- 5.
- 6.
- 7.
- 8.

Build An Inclined Plane- Draw sketches of the **Inclined Plane** you built in your group. Please use the back of this page if you need more room. Label



Exploring Levers

[\(Simple Machine Websites\)](#)

What is a Lever? A **lever** is a bar or board that moves at a point that does not move but rotates when you put force on it. A double **lever** is two **levers** attached to each other at the fulcrum. (pruning shears, nutcracker, ice tongs) There are three different kinds of **levers**: First-Class, Second-Class and Third-Class. Draw an example of each type below and label the fulcrum on each drawing.

First Class (seesaw)

Second Class (wheelbarrow)

Third Class (bat)

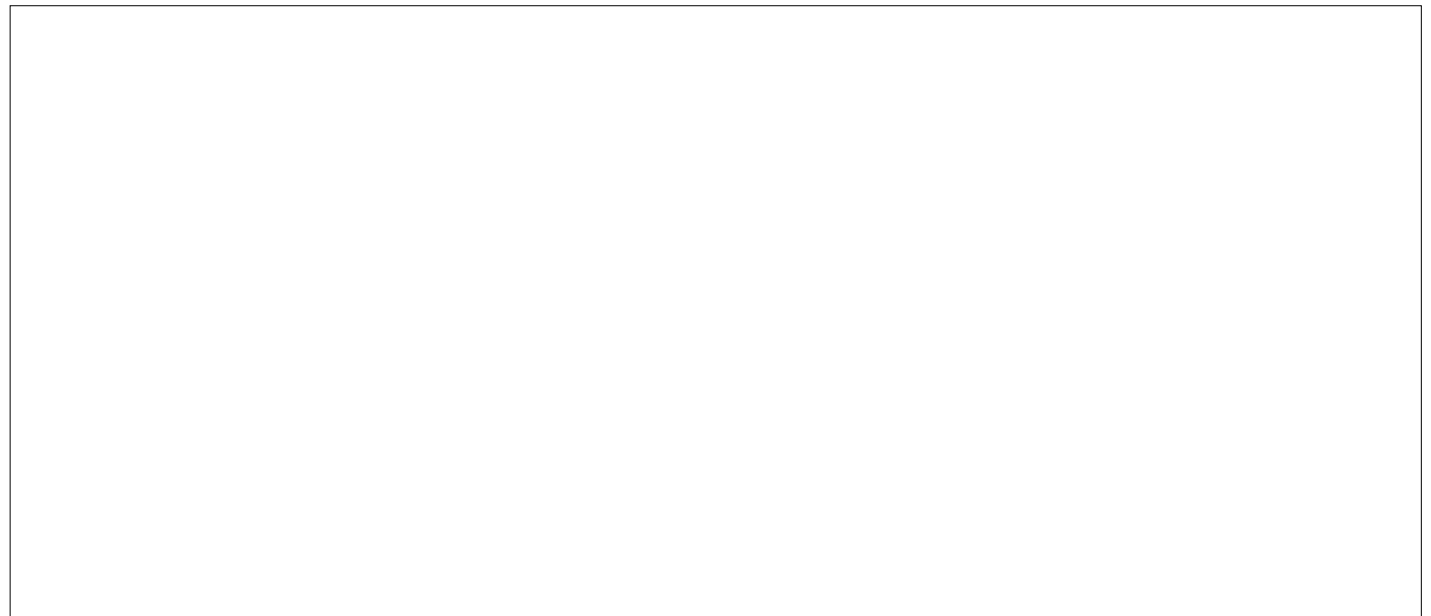
How does a Lever help us? A **lever** helps us move or lift things with little force. A **lever** makes work easier by reducing the amount of force needed to do a job. Think of the lifting the elephant example! Some levers also change the direction of the work that is being done.

What are some examples of **levers** in our everyday lives?

Examples of Levers

- 1.
- 2.
- 3.
- 4.
- 5.
- 6.
- 7.
- 8.

Build A Lever- Draw the **levers** you built in your group. Please use the back of this page if you need more room. Label the **fulcrum (F)**, the **resistance (R)**, and the **effort (E)** on each **lever** and look for which one of these is in the middle.



Exploring A Wheel and Axle

([Simple Machine Websites](#))

What is a Wheel and Axle?

The **Wheel** is a round disk. The **Axle** is a rod that runs through the center of the wheel. The **Wheel and Axle** can make work easier by rolling things instead of pulling them. Sometimes a **Wheel** turns an **Axle**. (doorknob) Sometimes an **Axle** turns a **Wheel**. (tricycle) **Did you know that the Wheel and Axle is one of the most important inventions of all times?!**

How does a Wheel and Axle help us?

A **Wheel and Axle** helps in three different ways:

1. Friction-**Wheels** make moving things easier. (car wheels)
2. Force-Turning the **Wheel** makes the **Axle** turn with more force (water wheel)
3. Distance-Turning the **Axle** makes the **Wheel** turn a greater distance (paddleboat)

How is a Wheel like a Lever?

A **Wheel and Axle** act as a lever that spins around rather than going up and down.

List 4 or more examples of Wheel and Axles in our everyday lives?

Examples of Wheel and Axle

1. **Motors**
- 2.
- 3.
- 4.
- 5.
- 6.
- 7.
- 8.

Build A Wheel and Axle- Draw sketches of the **Wheel and Axles** you built in your group. Please use the back of this page if you need more room.

Exploring the Pulley

What is a Pulley? ([Simple Machine Websites](#))

A **pulley** is a wheel with a rope moving around it. One end of the rope is attached to a load. There are two types of **pulleys**:

Fixed - a pulley that does not move when you pull the cord

- changes the direction of the force
- draperies and flagpoles

Moveable - a pulley that moves when you pull the cord

- attached to the object
- changes the amount of force
- the more moveable **pulleys** used-the easier the job gets
- sailboat sails and cranes

***Combination Pulley** - a series of fixed and moveable pulleys used together to get the advantages of both.

How does a Pulley help us?

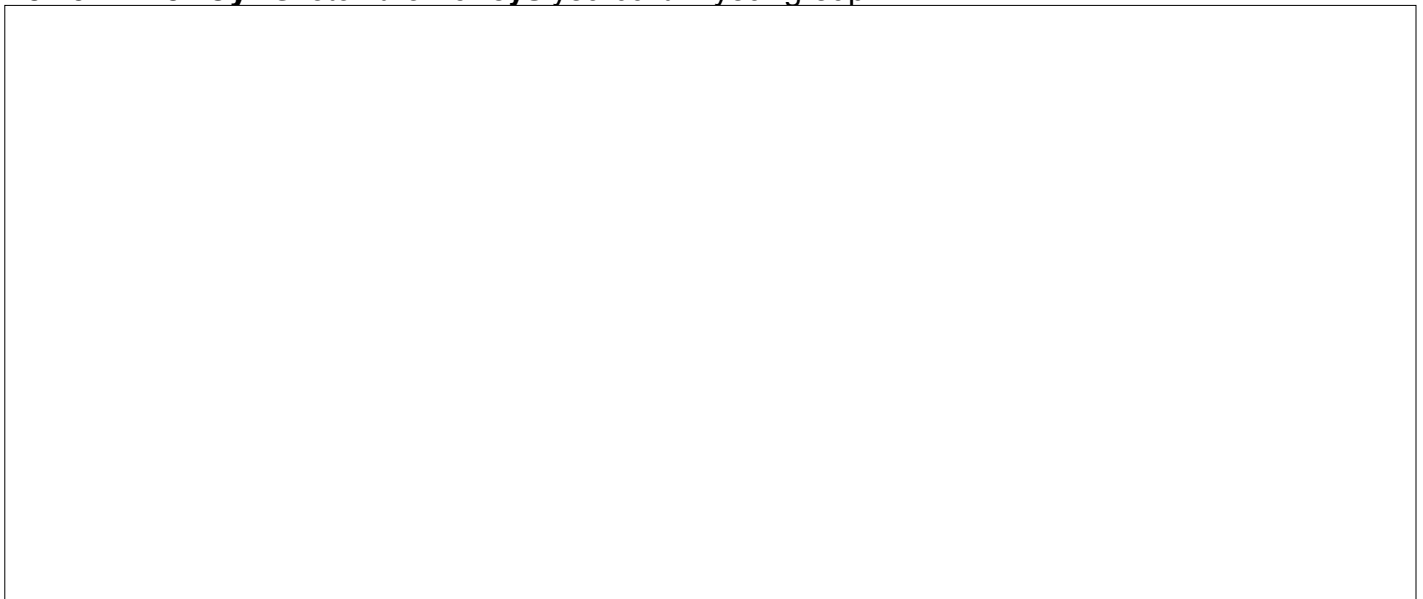
A **pulley** is a simple machine that makes work easier. A **pulley** helps by letting you use your force in the direction that is easiest for you. Other **pulleys** help by letting you use less force to do a job.

List examples of Pulleys found in our everyday lives?

Examples of Pulleys

- 1.
- 2.
- 3.
- 4.
- 5.
- 6.
- 7.
- 8.

Build A Pulley- Sketch the **Pulleys** you built in your group.



Exploring the Inclined Plane II

“Screws”

What is a Screw? [\(Simple Machine Websites\)](#)

A spiral or **screw** is a special type of **Inclined Plane** that is wrapped around a cylinder. Objects that are screwed together hold better than nails and provide great strength.

How does a Screw help us?

Some **screws** move objects along the threads. Others twist in a spiraling motion to move through different materials. **Screws** make work easier by changing the amount of effort needed to do a job or the distance covered. The distance around the **screw** is greater than the length of the **screw**.

Archimedes Screw -

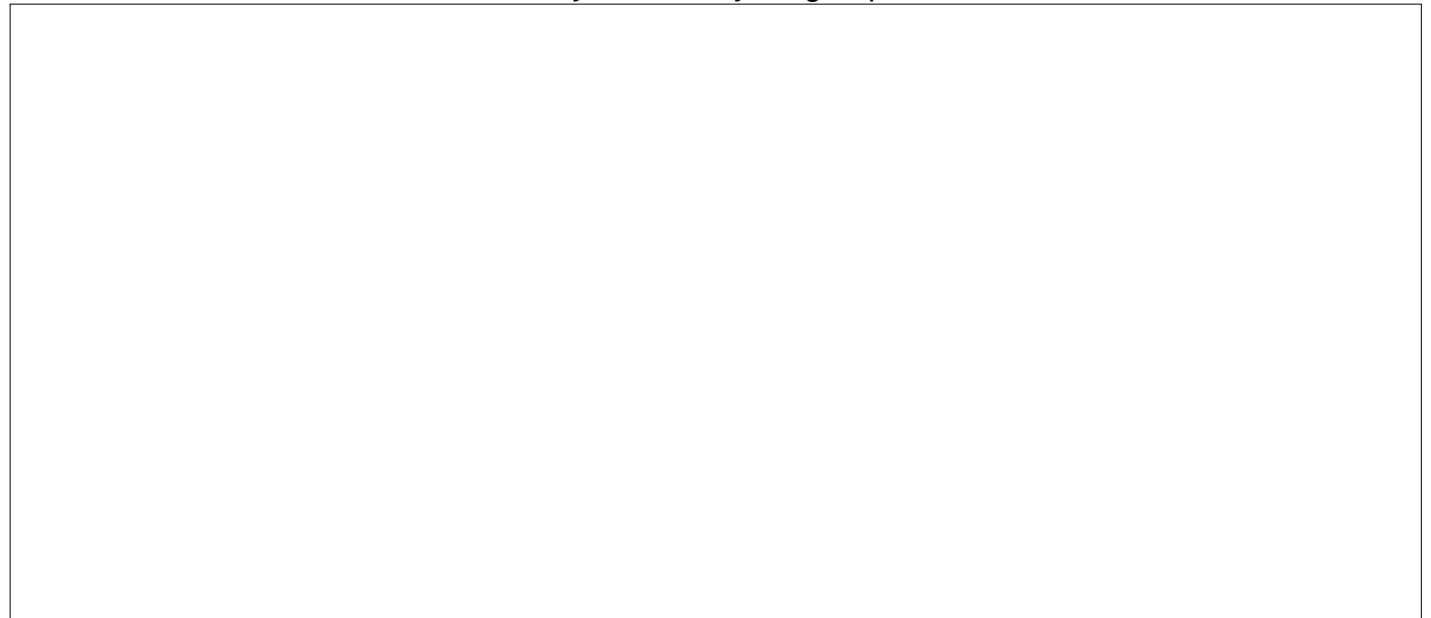
One very famous type of **screw** was designed long ago to help bring water to a village from a river far away. The Greek scientist and mathematician, Archimedes, invented this machine, called the Archimedes Screw. Water is extremely heavy and hard to lift or move. The force needed to turn the handle on the Archimedes screw is small so the water moves easily along the slope of the screw.

List places in our everyday lives that we see or use screws?

Examples of Screws

- 1.
- 2.
- 3.
- 4.
- 5.
- 6.
- 7.
- 8.

Build A Screw- Draw the **screws** you built in your group.



Exploring the Inclined Plane III

“The Wedge”

What is a Wedge? ([Simple Machine Websites](#))

A **Wedge** is a double **Inclined Plane** with a narrow cutting edge. **Wedges** help to split or cut things apart. **Wedges** are the only **Inclined Planes** that do the moving when being used.

How does a Wedge help us?

The effort needed to do a job when using a wedge is reduced but must be applied over a longer distance. Remember that the longer the slope of the **Inclined Plane**, **Screw**, or **Wedge**, the easier the job is.

What other examples of Wedges in our everyday lives?

Examples of Wedges

1. scissor blades, point of a nail, an ax, your teeth
- 2.
- 3.
- 4.
- 5.
- 6.
- 7.
- 8.

Build A Wedge- Sketch the **Wedges** you built in your group.

