

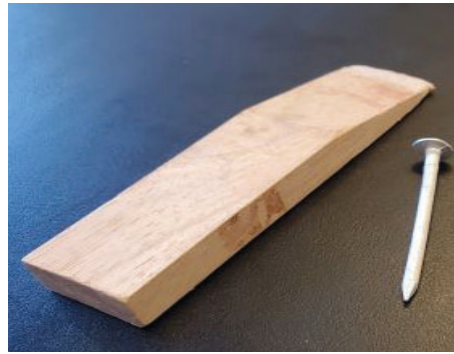
# Chain Reactions

## SIMPLE MACHINES

**Simple Machines** are a group of devices that make work easier. There are six basic simple machines that fall into two broader categories. Most chain reaction machines use repeated variations of common simple machines in a sequence.

### Ramps, Wedges & Screws (variations of an inclined plane)

An inclined plane is a sloped surface that allows a thing to roll or slide up or down. It is generally easier to slide or roll something than to lift it.



#### Ramps

A ramp is a sloped surface that allows something to roll or slide up or down. Ramps are the most common way to roll, slide or drag balls, wheels, and even non-round objects.

##### **Examples of Ramps:**

- Wooden boards can be leaned against other blocks to make a ramp
- Commercial building kits – Legos, K-NEX, Hot Wheels, etc.
- Pool noodles or foam pipe insulation cut in half like a trough
- Yardsticks and rulers can make simple ramps for rolling marbles
- Stairs – falling up, Dominoes, or falling/rolling down, balls or wheels

#### Wedges

A wedge is a V shaped block used to push things apart or hold things in place. A wedge can be used to hold a wheel in place and then pulled free allowing it to roll.

##### **Examples of a Wedge:**

- A doorstop is a wooden wedge jammed between a door and the floor to hold it in place
- A knife is a narrow wedge used for cutting through things like butter
- An axe is a metal wedge used for splitting or chopping pieces of wood
- A plow is a metal wedge used for pushing apart the soil in a field or garden

#### Screws

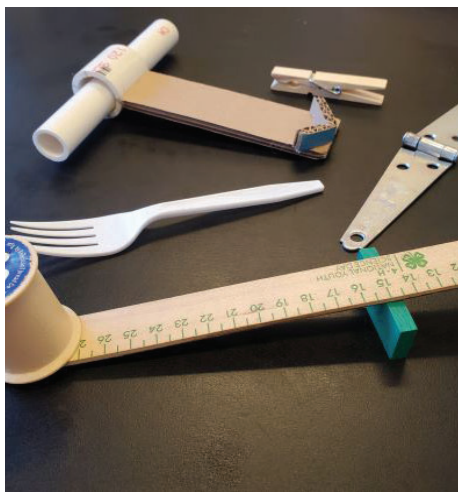
A screw is a spiraled surface along a narrow cylinder or rod. Imagine wrapping a thick string around a long stick in a spiral. In chain reactions screws can be used to slowly move or turn things.

##### **Examples of a Screw:**

- Jar lids
- The base of a light bulb
- Drills
- Nut & Bolts
- Car Screw Jacks

## Levers, Wheel & Axle, and Pulleys (things that turn around a point)

These simple machines all turn, or pivot, around a point. Levers pivot on a fulcrum, wheels spin around an axle and pulleys use ropes and wheels to help lift and move objects.



### Levers

A lever is a rod, bar or plank that pivots around a point called a fulcrum. Levers can be moved on one end and then lift or move an object at the other end.

#### **Examples of Levers:**

- See-saws
- Forks or spoons
- Toppling Dominoes, books, blocks, etc.



### Wheels

Circular round objects that spin around a center point (axis/axle). The best part about wheels is that they can roll from one place to another.

#### **Examples of Wheels:**

- Wheels or cylinders
- Balls, marbles or other spheres
- Cams, which are wheels that are weighted on one side, not perfectly round, or has its axis off center. Cams will wobble instead of rolling smoothly.



### Pulleys

A wheel with a string or rope around it. Pulleys allow you to pull down on a rope in order to lift something up.

#### **Examples of Pulleys:**

- Pulleys are used to hoist flags up a flagpole.
- A block and tackle is a series of pulleys used to lift very heavy objects like heavy sails on ships.
- A falling object can pull a string over a pulley to lift something.

### FOR MORE ON CHAIN REACTION MACHINES

Visit UNH Extensions 4-H Maker Pathway page Making Chain Reactions.  
<https://extension.unh.edu/resource/making-chain-reactions>

### QUESTIONS?

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### AUTHOR AND COPYRIGHT

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