



# High Touch High Tech®

Science Experiences That Come To You

## Simple Machines – Level

A perfect gift for Father's Day!

### Ingredients & Supplies:

- 1/3 piece of clear plastic drinking straw
- Container of plumber's putty
- 9 oz. plastic cup water
- Food coloring
- Pipette or eye dropper
- Black Marker

### Instructions:

Take your piece of drinking straw, hold it horizontally and find the center of it. With a black marker, mark two lines on your straw so that the center point is in the middle of your two lines.

Pour ½ cup of water into the 9 oz. cup. Put 3 drops of food coloring into the water.

Next, use some plumbers putty and block off one end of your straw. Use a pipette or eye dropper to fill your straw ¾ of the way with the colored water. Block up the other end of the straw with your finger and tilt to make sure you have an air bubble inside the straw.

Now block the other end of the straw with putty. Set your level on the desk and see if your air bubble sits in the middle. When the air bubble is in the middle of your straw, you have a level!

### The Science Behind It:

Have you ever watched your father or grandfather building a doghouse or put up shelves? When a builder constructs something, he needs to be sure that the boards are perfectly straight. What would happen if you tried to put your glass of milk on a table that was crooked? It would tip over! Builders have to make their construction level. This means that both sides are perfectly even. To do this, builders use a simple machine called a level. A level is used to measure something horizontally. When someone is building a table or cabinet, a level is used to make sure the boards are perfectly straight.



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A machine is something that makes work easier. The cool thing about machines is that the simplest machine and the most complicated machine work off the same principles.

There are 6 types of **simple machines** – Inclined Plane, Wedge, Pulley, Wheel and Axle, Screw, and Lever.

An **inclined plane** is a slanted surface used to raise objects. Examples of inclined planes are ramps and stairs.

A **screw** is a winding inclined plane. Some examples are the mouths of jars, tubes, and hoses.

A **wedge** is made of 2 inclined planes back to back and is used to spread an object apart or raise an object. Some examples would be a doorstop, a knife, scissors or an ax.

A **lever** is a bar that pivots about a fixed point. This point is called a **fulcrum**. Some examples are a screwdriver used to open a can of paint, a crowbar used to open a box or jack up a car, a teeter-totter, and a shovel.

A **pulley** is a form of a lever. It changes the direction of the force. Pulleys are used in wells to pull up the bucket of water, a flagpole to raise and lower the flag, a clothesline to pull clothes, and to open and close window blinds.

A **wheel and axle** is used on cars, trains, wheel barrels, or anything containing wheels.

A **compound machine** is just two or more simple machines combined to work together. A compound machine really does not have to be complex. A manual can opener is an example of a compound machine. The arms are levers, the blade is a wedge and the wheel and axle is used to spin the can opener.

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