

ACTIVITY

On the Straight and Level!

In the introduction you made a plumb bob that used gravity to make sure things are vertical. Now you can make a water level, a tool that uses gravity to make sure things are straight across! The water level works because when water is in a confined space, gravity makes sure the top of it is level.

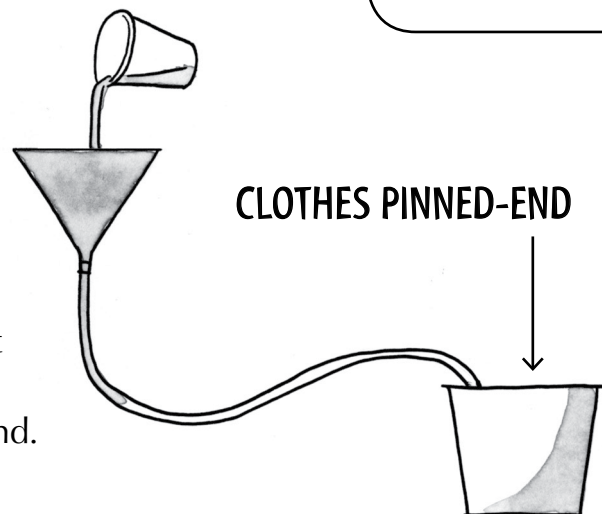
Caution: This activity is best done outside.

1 Fill both cups about half full with water. Stand them side by side. Notice how the water goes straight across. Tilt one cup slightly, but not enough to spill it. Look at the water—is the top of it tilted or straight across? Compare the top edges of water in both cups.

2 Add several drops of food coloring to the water and stir to mix.

3 Use one or more clothespins to clamp one end of the clear plastic tubing closed. Place this end into a bucket on the ground.

4 Insert the funnel into the open end of the tubing. Slowly pour the colored water into the tube. Do not fill it all the way. There should be a few inches of empty space at the end.

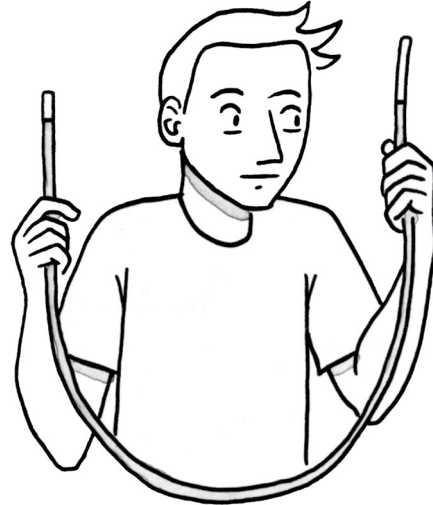


SUPPLIES

- 2 clear cups
- water
- food coloring
- spoon
- 10–15 feet of clear plastic tubing
- clothespins or other clamps
- bucket
- funnel
- 8–10 books



5 Hold both ends of the tube up at the same height. Remove the clothespins from the clamped end. The water line should move until it is at the same level on both sides. If it isn't, that means there are air bubbles in the tube. Gently tap the sides to get the air bubbles to move out.



6 Go to a flat place. Make two stacks of books about 10 feet apart. One person should hold one end of the open tube so the water level is lined up with the top edge of one pile of books. Another person should hold the other open end of the tube near the top edge of the second pile of books. It is okay if some of the tube is just lying on the ground. You know the stacks are even if the water lines up exactly with the top of both stacks. If they are not even, add or remove books to each stack until they are even.

7 Use the level to see if a table, deck, or fence top is level.

THINGS TO TRY: What happens if you put the stacks of books on stairs or a small hill? Use the level to find things that are at the same height in other parts of the room or yard.

Did You Know?

Airplanes have an instrument in the cockpit that works like a level. It is called an attitude indicator. It can tell pilots if their wings are level and if the nose of the plane is pointing up toward the sky or down toward the earth.

