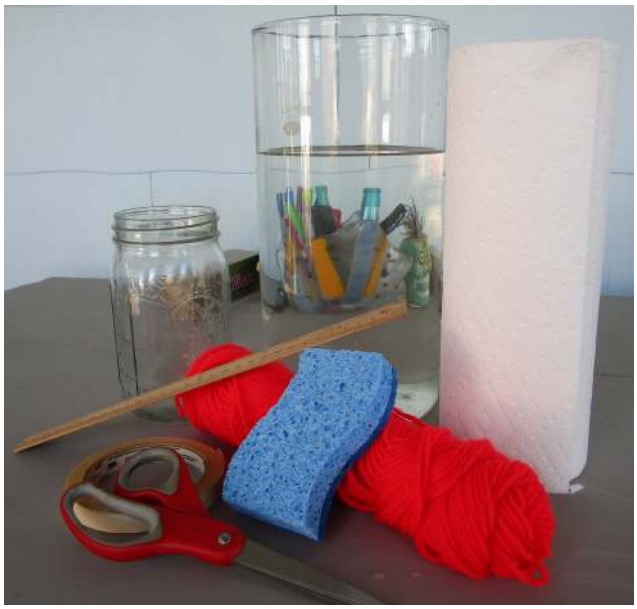
Water Walks



Supplies Needed:

- A bucket of water
- A cup
- A large jar or smaller bucket
- Masking tape
- Ruler
- Several lengths of yarn.
  - 6 inches
  - 8 inches
- Paper towel
- Scissors
- A dry sponge (used is fine)
- Towels (for clean-up)

The Setup:

Warning this lab can get messy. Please place towels around a larger area where you'll be working for easy clean up.

Place the towels down around the area you'll be using. Put the bucket of water down on it, you'll be using this instead of a sink to get water from. Place the larger jar down on the table with a towel under it.

Cut your paper towel into strips that are about 1 - 2" wide. This is not exact, but the thinner it is, the more likely it is to fall apart.

Cut your string into 6 and 8 inch lengths. You'll only need one of each length per child.

Procedure:

Dip the edge of the sponge into the water and watch how the water sucks up into the sponge. This is capillary action! The water is being sucked up the sponge through small tube-like tunnels within the sponge as it soaks it's way through. Notice how slowly it moves. This is *capillary action*. The water uses both *adhesion* and *cohesion*. Adhesion is when the water sticks to the side of the tiny tubes. Cohesion is when the water sticks to each other.

Remove the sponge before the water travels halfway up the sponge. Notice how the water drips off the sponge, first in a sheet, then in rivulets, then in drops. Water molecules like to cling to each other with *cohesion*.

Now, take a strip of paper towel. You'll use the masking tape to tape one end of the towel to the inside of the jar, like shown below:

With the cup, take a small amount of water out of the bucket.

Now, holding the paper towel strip taunt and at a slight upward angle, slowly pour the water on the end near your hand.

Notice how the water moves quickly through capillary action towards the jar.

Both the sponge and the towel use capillaries to make the water move down the medium. But what if the medium doesn't have such a structure?

A string is solid. Yet, you can still get water to walk down it using *cohesion* of water molecules.

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The Science:

We've mentioned adhesion, cohesion, and capillary action. Here is a quick graphic to show how it looks.

Remember, adhesion is when the liquid is attached to a non-liquid. Cohesion is when it's drawn to itself.

Together, they work to draw the liquid up the small tubes of the sponge or towel. On the string you are taking advantage of cohesion.