

The **WAYS** of **WATER**



PROPERTIES OF WATER

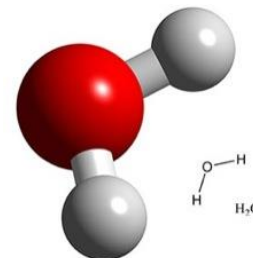
Did you know that 60% of your body is made of water?

Or that 71% of our planet is covered in water?

If you live in Douglas County, like me, and are near the Umpqua River, you're used to a lot of rain, big rivers and reservoirs!

With all of this water around, we should probably know some more about it!

For starters, the water molecule is composed of 2 hydrogen atoms (H) and 1 oxygen atom (O). The chemical formula for water is therefore H_2O .



Note the size of the oxygen atom compared to the hydrogen atom in this image.

The larger oxygen atom is **negatively charged** while the hydrogen atom is **positively charged**.

This makes water molecules **polar** (like magnets), meaning that opposite charges attract.

The negative hydrogen atom of one water molecule bonds with the positive oxygen atom of another water molecule. This is what makes water “sticky”

SO HOW STICKY IS WATER?

In this experiment, you will observe two properties of water called cohesion and adhesion.

Cohesion is when water molecules stick to each other.

Adhesion is when water molecules stick to other things like paper, clothes, glass, etc.

EXPERIMENT 1: Move water from one cup to another cup using adhesion and cohesion

You will need:

- Two cups (plastic is best)
- A piece of string at least 2 feet long
- Water
- Tape (optional)
- Food coloring (optional)

Instructions:

1. Tape or hold one end of the string into a cup. Fill this cup with water and food dye (if you have it). You'll want to go out on a porch or lawn for this experiment.
2. Hold the cup with water above the empty cup. Keep the two cups at least 1 foot apart.
3. Hold the other end of the string over the empty cup. Make sure the string is held tight.
4. Very slowly pour the water along the string into the empty cup.
5. You may have to adjust the height of the cup, the tension of the string or the speed at which you pour the water.



You are witnessing the water sticking to itself (cohesion) and also sticking to the string (adhesion).

THINK ABOUT IT! Where in nature would you see cohesion/adhesion?



EXPERIMENT 2: Make paperclips float!

In this experiment, you will observe a property of water called surface tension.

Surface tension is the “skin” of water. Surface tension is created when water molecules at the surface are attracted to each other as well as to the water below them.

Your task is to float a paper clip (or toothpick) on the surface of water.

You will need:

- One cup
- Some paper clips
- Paper towel or dish towel
- Water



1. Fill a cup with water.
2. Gently place a dry paper clip flat onto the water's surface tension (try not to touch the water).
3. You may have to try different methods for placing the paper clip down gently and make sure to try off any paperclips that fall into the water.
4. With some luck, the paper clip will remain floating! Now see how many more you can add!

Eventually all of the paperclips will fall into the water. This is the point when you have added too much weight at the surface tension of the water cannot hold it anymore!

THINK ABOUT IT! Where in nature would you see an animal using surface tension? For starters, check out the amazing way these water striders stay on the surface (*just click on the video icon*).



EXPERIMENT 3: See how much water you can fit on top of a penny!

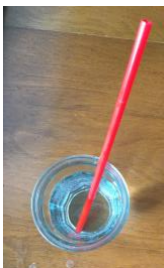
You will need:

- One cup of water
- 1 penny
- 1 eye dropper or pipette (or plastic straw)
- Paper towel or dish towel

Watch this video for detailed instruction!



Instructions:



1. Fill a cup with water and use it to fill your dropper with water.

If you don't have a pipette or eye dropper, you can take a straw, put it in the water, bend the end tightly and then gently release pressure to let out drops onto the penny.

2. Place your penny on a flat surface
3. Begin adding water 1 drop at a time and count as you go!
4. How many drops of water does a penny hold????
5. What about if you try a dime or a quarter?

The Science Behind It: The water tension can only extend so far over the penny before it breaks and all of the water spills off. After the next rain fall, go find a small leaf or grass and see if there is a dew drop of water on it.



Digging Deeper:

Soon we will begin learning about a **watershed** and where our water comes from and where it goes. Throughout this journey, we will learn more about the water around us. Today you have taken your first “splash” into the watering hole! Great job!!

Our planet is made up of 71% water! But only 3% is fresh water for drinking. 1 in 9 people on our planet lack access to a safe supply of drinking water. We are so lucky to have clean water to drink from the fountain and at home. For this reason, every drop counts! And it's important to think about how you are using water every day!

While you're at home, start thinking about the ways that you and your family use water. Are there things that you could do to reduce how much comes out the tap?



- Do you take showers longer than 5 minutes?
- Do you run the dishwasher or the washing machine before they're full?
- Do you keep the sink running while brushing your teeth?

CHALLENGE!

Choose 1 way that you could reduce your water use and help conserve our area's water needs!

THOUGHT-PROVOKING:

Could we run out of fresh water? Find out [HERE](#)

Thanks for joining me for this Home Explorer activity from Umpqua Watersheds Education Program. Join me for the next activity post tomorrow!

- Ms. Robyn

