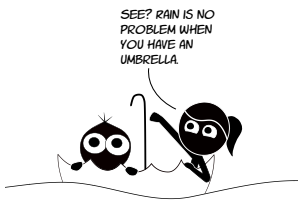
SMG #1

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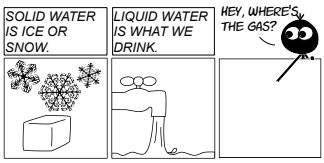
# SCIENCE MOM'S
## *Guide to WATER, Part 1*

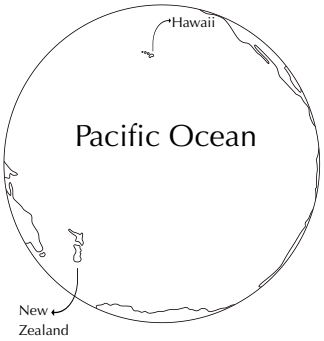

Water is the *only* thing on our planet that exists naturally in all three states of matter—as a solid, liquid, and a gas.




Gaseous water, or water vapor, is invisible. You can't see it, but it's in the air around you and we call it **humidity**. The more water vapor in the air, the more humid it is.

*The only other things on earth that come close to existing in all three states of matter are mercury, acetic acid, and carbon dioxide. While all three states of matter are **possible** for each of these, they don't occur **naturally**.* Water, on the other hand? It's everywhere.





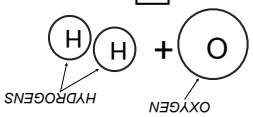

Oceans cover most of the surface of the earth, and at any given time about 50-70% of the planet is covered by another form of water: clouds.

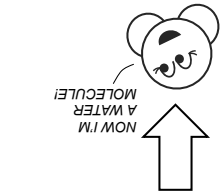




## *WHAT EXACTLY IS WATER?*

It's 1 oxygen atom plus 2 hydrogens.

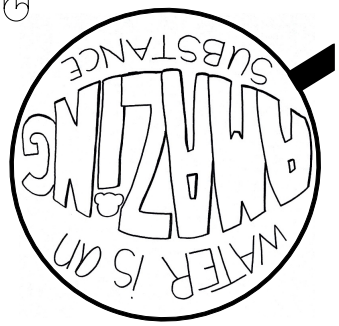



And that's why we call it: $H_2O$



Try these investigations to learn more about water's incredible properties.







## **1.** Gravity Defying Lid

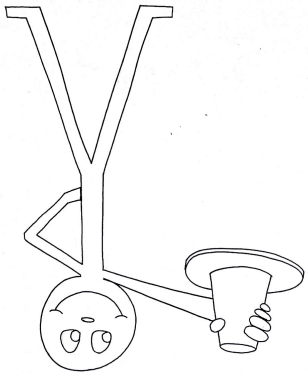
*Materials:*

- Water
- Cup
- Plastic lid or a piece of cardstock or cardboard.

*Method:*

**a)** Pour water in the cup and place the lid on top.
**b)** Place one hand on the lid and INVERT the cup (turn it upside down.)
**c)** Remove hand and be amazed!





## **2.** Magic Screen

*Materials:*

- Water
- Lid
- Canning jar with a metal ring
- A piece of screen or other mesh fabric

*Method:*

**a)** Fill jar to rim and secure screen over the top.
**b)** Cover with lid and flip over.
**c)** Remove lid and observe.

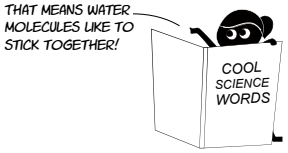
*No jar? No problem! Just use a cup and rubber band. But be sure the screen or mesh is FLAT and TIGHT across the rim of the cup.*





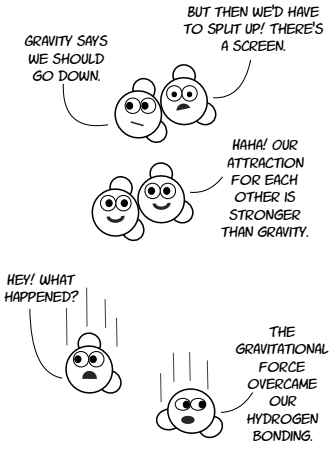

*HOW DOES IT WORK?*

## Cohesion.




*The water molecules are sticky, or cohesive. They are attracted to each other and the jar and the screen. That attraction is strong enough that they effectively form a "lid" on the bottom of the jar, just like the plastic lid did in the first investigation. If air doesn't come in, the water can't go out. So the water stays inside—until you shake or tip the jar. If you do either of those things, then gravity wins.*








## **3.** Hot & Cold Cups

*Materials:*

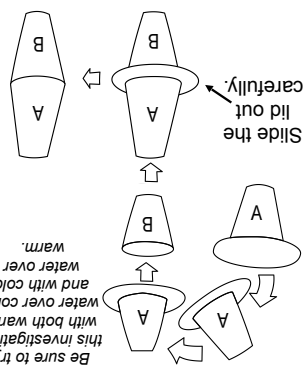
- Food coloring
- A flat lid or cardboard
- 2 identical clear cups or jars
- Warm and cold water

*Method:*

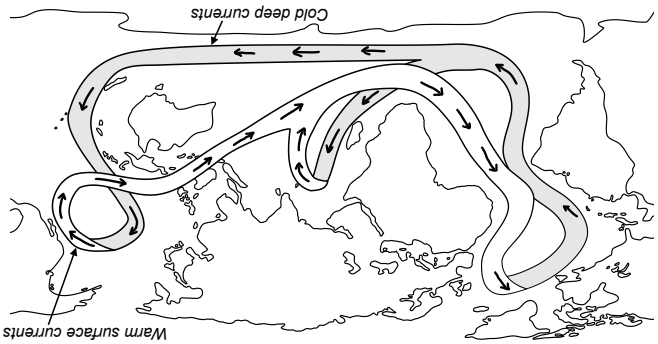
**a)** Add different colors of food coloring to each cup.
**b)** Fill each cup to the brim, one with warm water and the other with cold.
**c)** Place a flat lid on one cup and invert it, then set it on top of the other cup.
**d)** Slowly, slide the flat lid or cardboard out from between the cups.



*Note: Removing the lid is best done with two people: one to hold the cups steady while the other pulls out the lid.*






Cold water is more dense than warm water so it sinks. Warm water, on the other hand, rises or "floats" on top. This phenomenon drives thermohaline circulation in the oceans—a massive system of currents that slowly but steadily circulates all the water in the oceans and strongly influences both marine life and the earth's climate.

B A A X

B C C D

F E E D

L G G X