DIY OCEAN BAROMETER

Changes in weather happen all over the world, as the climate changes, so does weather! Ships use barometers to help them move across the ocean safely. You can use your DIY barometer to remind you to grab an umbrella next time it's raining outside!

What is a barometer?
A barometer is an instrument that measures atmospheric pressure. It is used for forecasting weather and sometimes to determine altitude.

How do you use a barometer?
There are many types of barometers, and each one works a little differently. Some use electricity or are battery powered and give you numbered readouts. Some, like the one we will make today, may be a little less accurate, but can still give you a good idea of what the weather will look like over time.

HOW TO MAKE YOUR BAROMETER:

STRAW/TUBE METHOD Materials Needed:

- Glass Bottle (plastic will work but results might be skewed due to the flexibility of the bottle)
- Water
- Food Coloring (optional makes it easier to see the changes)
- Straw/tube
- Tape
- Marker

STRAW/TUBE METHOD Instructions:

1. Color water with your favorite color
2. Fill glass bottle 3/4ths of the way with water
3. Make a hole in the top of the lid of the bottle
4. Glue the tube/straw into the hole in the lid
5. Put the lid on the bottle but DO NOT completely close the lid.
6. Suck or draw some water into the straw/tube (be careful not to drink the water!) About halfway is a great place to start!
7. Place your finger over the straw/tube trapping the water in the straw.
8. Close the lid tightly and seal with tape.
9. Mark the water level on the tube with a marker

BIRCH AQUARIUM
at Scripps Institution of Oceanography
UC San Diego

10. WATCH and WAIT - over time (hours to days) the water level should change based on the air pressure outside. You can make marks on the tube as the changes occur.

BALLOON METHOD Materials Needed:

- Glass Bottle with large opening (plastic will work but results might be skewed due to the flexibility of the bottle)
- Balloon
- Long skinny object (like a straw or skewer)
- Paper
- Tape
- Marker or Pencil

BALLOON METHOD Instructions:

1. Place Balloon over the top of the Bottle
2. Seal balloon with rubber band or tape

3. Tape a straw or other long skinny object against the top of the Balloon
4. Place the barometer next to a piece of paper where the tip of the straw meets the paper
5. Mark the starting level on the paper
6. WATCH and WAIT - over time the water level Should change based on the air pressure outside, mark the paper as the changes occur.

Helpful Hints: Over time, the tape/glue seals on the bottle might break. To keep it working, just add a layer of glue or tape as needed!

If you start with the water level too close to the top, the water may spill out! This will not ruin the experiment but can be a little messy!

HOW TO READ YOUR BAROMETER:

Straw/Tube Method:

- If the water in the spout rises or even spills out of the spout, this means that atmospheric pressure outside the bottle has decreased allowing the water to rise.
- In the summer, an increase in pressure (when the water in the tube goes down) means the temperature will begin to cool, and precipitation should be expected..
- A decrease in pressure (the water in the tube will go up) also indicates a cloudy day. If the water in the barometer rises quickly and greatly, or even spills out, expect heavy precipitation.
- If the water in the spout falls and moves back into the body of the barometer, this means that outdoor atmospheric pressure has increased. This usually indicates clear weather.
- If the liquid in the tube falls slowly, the weather will stick around. If it drops quickly, then the weather will come and go.

Balloon Method:

- If the balloon inflates, this means that atmospheric pressure outside the jar has decreased allowing the balloon to rise.
- In the summer, an increase in pressure (when the balloon deflates) means the temperature will begin to cool, and precipitation should be expected..
- A decrease in pressure (the balloon will inflate) also indicates a cloudy day. If the balloon rises quickly, expect heavy precipitation.
- If the balloon falls or even moves back into the body of the jar, this means that outdoor atmospheric pressure has increased. This usually indicates clear weather.
- If the balloon changes slowly, the weather will stick around. If it drops quickly, then the weather will come and go.