MYSTERY: HUMIDITY · 15 MINUTES + A WEEK OF READINGS

The Hair Hygrometer

Why does winter air feel so dry? Build a hygrometer from a single hair, then check it every day to track how much water is in the air.

What you'll need

- ✓ A single long hair
- ✓ An index card
- ✓ A piece of cardboard
- ✓ A thumbtack
- ✓ Tape
- ✓ Scissors
- ✓ A dime
- ✓ A ruler
- ✓ A pencil

Build it

1. Cut an arrow out of the index card and tape the dime to the pointed end.
2. Pin the other end of the arrow to the cardboard with the tack. Leave it loose enough to swing.
3. Cut a notch in the top of the cardboard and tape one end of the hair there.
4. Tape the other end of the hair to the arrow so the hair is pulled tight and holds the arrow up.
5. Tape a strip of paper beside the arrow's tip and mark where it points.

Read it

6. Mark where the arrow points at the same time every day for a week. Measure each change in millimeters.

Tip: Build two, with two different kinds of hair, and see which one moves more.

Why it works

Hair soaks up water from the air. It gets a tiny bit longer when the air is humid and shorter when it's dry. The arrow works like a lever and makes that tiny change big enough to see.

Cold winter air can't hold much water. When we heat it up indoors, it can hold more, but it doesn't get any more, so it feels even drier. That's why lips and skin crack in winter.

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Record your results

Day	Date	Change from yesterday in mm	Weather that day
Day 1			
Day 2			
Day 3			
Day 4			
Day 5			
Day 6			
Day 7			

WINTER CONNECTION

When air cools down to a temperature called the **dew point**, the water in it comes out as fog, dew or frost. That's why you find frost on cars after a cold, clear winter night.

Think about it

1. On which day did your arrow move the most? What was the weather?

2. Why would it help to build two hygrometers with different kinds of hair?

Watch the video and try 4 more winter mysteries

Scan the code, or visit superchargedscience.com/opt/winter-science-mysteries-your-experiments. From the Supercharged E-Science Program.

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