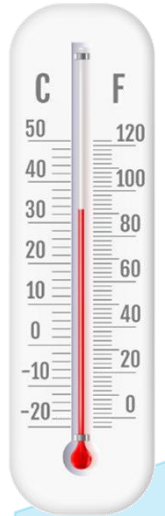


# Engineer a Thermometer

The first thermometer was invented in 1709, more than 300 years ago, by Daniel Fahrenheit. Historically, glass thermometers used mercury because its molecules react very quickly to temperature changes compared to water. However, alcohol is more commonly used now because it is less dangerous if the glass thermometer breaks. Now, engineer your own thermometer!



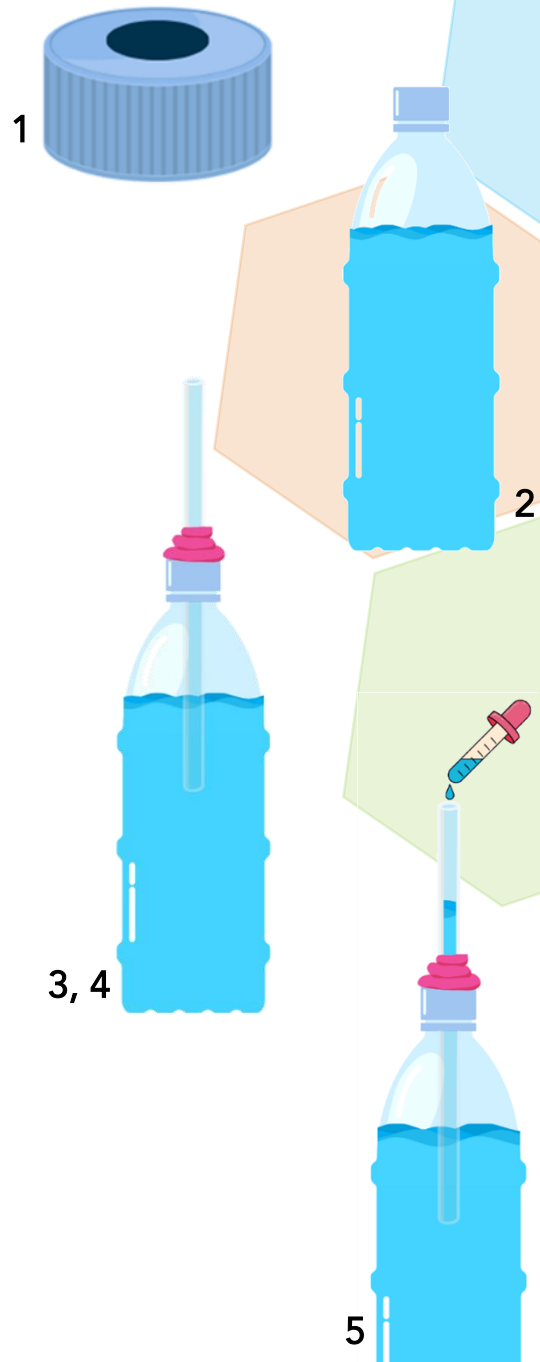
## Materials:

- Plastic Bottle with Lid
- Play Dough
- Water
- Scissors or Pencil
- Clear Straw
- Marker

*You will need an adult's help with part of this activity.*

## Procedure:

1. Remove the lid from the bottle and with an adult's help, poke a hole large enough for your straw to fit through.
2. Fill the bottle most of the way with water, then place the lid back on and twist it closed.
3. Place the straw through the lid and into the bottle. You will want the bottom of the straw in the water but not touching the bottom of the bottle.
4. Wrap the play dough around the straw where it is going through the lid. Press it tightly so no air can come out of the hole in the lid.
5. Add water to the straw one drop at a time until the water line in the straw is above the lid and play dough.

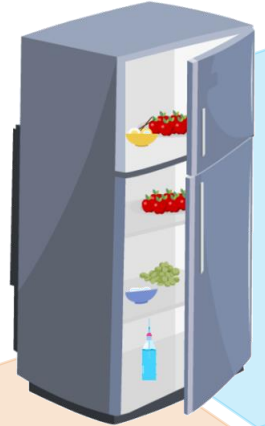


# Engineer a Thermometer

6. Mark the straw at the water line with a marker. This line indicates the starting temperature. You've made a thermometer!



7. Move your thermometer to an area with a different temperature. It can be a warmer or colder location than where you started. Leave your thermometer for a while and then come back and check on it. *What happened to the liquid in the straw? Did it move up, move down, or not move at all?* 7



**What's happening?** When the temperature increases, air molecules spread apart and take up more space, pushing the water up the straw. When the temperature decreases, the air molecules contract, or get closer together, and take up less space, letting the water fall down the straw.



While thermometers usually tell us the exact temperature using degrees (like 70°F), your homemade thermometer only indicates general changes in temperature.



## DID YOU KNOW?

A **meteorologist** is someone who studies the atmosphere. We mostly know them as weather forecasters. If you liked this activity, maybe meteorology is for you!