Gross Science

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STEAM Square Activity Sheet

Supplies Needed:

- Water
- Paper Towel or Washable Cloth
- Wrapped Chocolate Candy (not teardrop shaped foil wrapped)
- Hair Dryer or desk lamp with 60 watt bulb
- ruler

Directions:

1. Wrap one chocolate in dry paper towel or cloth while the other is wrapped in one that is damp but not dripping wet.
2. Place the hair dryer 8 inches above the candies on high for 5 minutes. If using a lamp, it would just be turned on for the 5 minutes 8 inches above them if not using the dryer method.
3. Unwrap the candies and record your observations

Questions:

A. What happened to each of the chocolates? Did they look different after the heat source was applied?

B. How can you compare this experiment to how your skin keep you cool on a hot day?

Extension Activity Ideas:

1

SUNSHINE

Re-do the experiment by leaving the candies in the sun in a window. What is similar?

2

THERMOMETERS

Re-try the experiment using thermometers to test the temperature differences

3

MATERIALS

What would happen if you used other types of cloth on candy in this experiment?

4

TAKE IT FURTHER

What happens when this experiment is run with other candies? Create a hypothesis.

The Science of Sweat and Evaporation:

Evaporation is the process that occurs when water changes from a liquid into a gas. When your sweat evaporates, it carries heat energy from your body with it. The faster your sweat evaporates, the more heat is carried away, and the more the skin surface from which it evaporates is cooled.

As water evaporates from an object, it makes the air above the object more humid, which, in turn, slows down the evaporation process. This is because once the air is already full of water vapor, there is nowhere for the water on your skin to evaporate. But if you fan the moist, humid air away, then the water can evaporate more quickly. That's why you feel cooler if you fan yourself or if there's a gust of wind.

In places with hot weather, engineers design misters. These misters help out your body's natural sweat cooling system by providing more water to evaporate and carry away heat energy from your body. Another way that you can keep cool on a hot day is by dipping a bandana in water and wearing it around your neck. The extra water from the bandana causes more evaporation, which keeps your body even cooler than it would be with only sweat.

You can apply the same process of evaporative cooling that your body uses in order to cool down objects. In the experiment above, we used paper towels and water to mimic the body's ability to keep you cool with sweat. Imagine if your body did not sweat or have enough materials to produce sweat. This would lead to dehydration. This is wy it is so important to drink lots of fluids to allow your body to maintain its own cooling system on a hot day or when you are very active or sick.

Questions

How does sweat cool your body down?
What are some ways people use evaporation to keep cool?
How do engineers use evaporation to keep objects cool?

References:

Justice, Lisa. "Keepin' It Cool: the Science of Sweat." Keepin' It Cool: the Science of Sweat - Explorit Science Center, 20 July 2012, www.explorit.org/news/keepin-it-cool-the-science-of-sweat.

What's the Big Sweat About Dehydration?, www.brennerchildrens.org/KidsHealth/Kids/Staying-Healthy/Keeping-Fit-and-Having-Fun/Whats-the-Big-Sweat-About-Dehydration.htm.