



Project Exploration creates transformative learning opportunities for youth underrepresented in the sciences –particularly students of color and girls – by equipping them with the skills, practices, and mindset needed for a lifelong pursuit of learning. STEM@Home makes activities around science, technology, engineering, and math accessible and fun to do at home. This STEMbook activity, resources, and more are available at www.projectexploration.org/stemathome.

In this activity, you will:

Follow the steps of the scientific method to determine whether materials have an effect on heat retention.

Supplies Required:

Graphic organizer
Assorted cups of different materials (foam, plastic, glass, metal, etc.)
Pitcher of water
3 Thermometers

Video

Learn about heat with Bill Nye: <https://tinyurl.com/46fvbej>

Overview

Let's think about something for a moment: You start drinking your milk and then decide to have some cereal with it...but when you get back to your milk, it's not as cold anymore. Why does this happen? Are there certain things that always stay cold or always stay hot? How does this work?

Cold liquids do not stay for long, but can you keep them colder longer? Does the type of material the cup the liquid is put into affect how quickly the water warms up to room temperature? As mentioned in the video, the more molecules, the more heat energy. Does the material of the cup have an affect on how quickly the liquid inside warms up? You'll be able to discuss or have answers for these questions after experimenting with cold water using different types of cups!



Instructions

**** Place a pitcher of COLD water in the refrigerator before getting started!

1. Using your graphic organizer, complete the experiment.
2. STEP 1: Problem: What do we want to solve? Does the material of the cup have an affect on how quickly the liquid inside warms up?
3. STEP 2: Hypothesis: Make a prediction! What type of material will keep the liquid cold?
4. STEP 3: Experiment: Test it out and make observations!
5. Get the pitcher of cold water from the fridge.
6. Choose 3 different cups—glass, ceramic, plastic, metal, etc.
7. Measure the temperature of the water in the pitcher. This is your starting temperature. Note this in the graphic organizer!
8. Pour the exact same amount of water into each cup.
9. Place a thermometer in each cup. Without taking the thermometer out of the cups, record the temperature of each cup every 2 minutes. Note this in the graphic organizer!
10. STEP 4: Analysis: Based on your observations what do we now know? What happened to the water in each cup? Why do you think that happened?
11. STEP 5: Conclusion: Was your hypothesis correct or incorrect?

Additional Resources

1. Learn about conductors and insulators: <https://tinyurl.com/yykmpxa>
2. Learn about heat transfer and engineering: <https://tinyurl.com/ydgdut8e>

Share It Out

Share on social media: Share the results of your experiment with your friends and family on social media! Explain the steps of the scientific method in a video! Use the hashtags:

#ScientificMethod
#ProjectExploration
#StemAtHome

Share via PE's website: Students who complete STEM@home activities and share what they learned with the PE team via our website will earn points which can be traded in for cash prizes at the Explore Store. Your project number is 304. Learn more at www.projectexploration.org/explore-store



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