

# Armpit Fudge

Grade Level: K, 1, 2, 3

Duration: 30-45 minutes

Classification: Classroom

Subject: Science

STEM Categories: Science

Keywords: The states of Matter, Conversion, Food, Edible

## Introduction

- Summary: The states of matter are evident in everyday activities such as cooking and baking, students will observe these changes and learn about daily science.
- Description
  - Students will use heat and friction to test transform common ingredients into different states of matter.
  - Students will learn the different physical properties between solids, liquids, and gases.
  - *Note: This activity is edible but contains milk. Students who are lactose intolerant will be able to participate, but cannot eat the end result.*

## Vocabulary

- Conversion - the process of changing or causing something to change from one form to another.
- Friction - the resistance that one surface or object encounters when moving over another

## Materials

Material	Quantity	Reusable?
Instant chocolate pudding	2 Tbsp per kid	No
Sandwich Ziploc bag	2 per kid	1 of the 2 bags will be
Plastic spoon	1 per kid	No
Milk	2 Tbsp per kid	No
Measuring spoons	1 set per group	Yes

Coconut	1 Tbsp per kid	No
Mini chocolate chips	1 Tbsp per kid	No

**Directions:**

- **Note:** Some students might be apprehensive to try this activity, explain that plastic bags are protective and that the fudge will be safe from armpit “germs”
- Discuss the states of matter and how to transition from one to another. Water is a good example.
  - Give an example of friction by having students rub their hands together quickly and ask if they can feel the heat being given off. Explain that this is what will happen when they use their armpit to make fudge.
- Pass out two Ziploc baggies to each student and have them put one inside of the other. Make sure that the one on the outside is the reusable one and the inner one is the new one.
- Depending on the age of the students, allow them to measure 2 tablespoons of instant pudding mix and 2 tablespoons milk into their baggies. If they are too young SRM will distribute materials.
- Have students close both bags and make sure all air is out of the baggies. It is recommended SRM check all baggies to make sure they are secured properly before allowing students to put them in their armpits
- Have students put the bag under their armpit of choice and tell them to apply heat and friction by stirring with their armpit.
  - You can have fun with this step and challenge them to make it look like a dance move, act like a chicken, or challenge them to do it for a certain amount of time without stopping.
  - Have them continue this process as long as necessary until the fudge becomes thicker, approximately 5 minutes.
- Once the fudge is thick, you can add mini chocolate chips for the “razor stubble” under the arm, and coconut for the “hair.” Making the armpit fudge a little “grosser.” Give them a spoon and let them eat their fudge!

### Discussion Question

- What are the three states of matter? **Liquid, gas, solid**
- How do you change from one to another? **Changes in physical properties: heating, cooling, pressure, friction**
- What changes did the fudge experience in our armpits? **Heat, pressure, friction**
- What other foods may change states of matter? **Beating egg whites make them into a fluffy semisolid, chilling jello makes it a solid, melting chocolate makes it a liquid, baking a cake turns the batter solid, etc.**

### Applications:

- Majors:
  - Dietetics/Nutrition
  - Food Science
  - Chemical Engineering
  - Chemistry
  - Geology
- Jobs:
  - Food scientist
  - Recipe developer
  - Chef
  - Chemist
  - Geologist
- Hobbies:
  - Cooking and baking
  - Making slime
- Real-world applications:
  - The states of matter are prevalent in everyday life and can be seen baking, cooking, and almost everything that involves heating and cooling.



PROGRAM FOR WOMEN  
IN SCIENCE AND ENGINEERING

This activity was last updated in fall 2020 by Student Role Models.