

I Can't Believe I Made Butter!

Target Audience: *Elementary School to Middle School*

Education Setting: *Group Activity*

Objectives:

- Provide students with an opportunity to make their own butter and explore the science behind its transformation.

Preparation

Note: This recipe will yield approximately 1/3 cup of butter.

Materials Needed:

- a. Glass pint jar with tight-fitting screw cap
- b. Small mixing bowl
- c. Wooden spoon or paddle
- d. Toothpicks for tasting butter
- e. Small marble (optional – can use this to hasten the process since it creates more agitation)

Ingredients:

- a. 1 cup whipping cream at room temperature*
- b. ¼ teaspoon salt
- c. Crackers for tasting butter (optional)

Lesson Activity

1. Pour 1 cup room temperature whipping cream into a clean jar. (Optional – insert marble.) Screw lid on tightly.
2. Have students take turns shaking the jar – about 1 shake every second – until small lumps of butter form throughout the cream. (*This will take about 10 minutes. You may want to turn on some lively music for inspiration.*)
3. Pour off liquid. Have students continue to shake the jar until butter is of uniform consistency.
4. Put butter in small bowl. Remove small marble if used. Press remaining liquid out of butter with wooden spoon or paddle.
5. Wash butter several times with cold water. This is done by simply pouring water over the butter, swirling it around, and pouring it off.
6. Add salt and stir. (*Students might taste the butter before and after salting.*)

***Note: It may take up to 12 hours for whipping cream to reach room temperature, so remove it from the fridge early. Don't worry if the cream smells slightly sour when opened, this is normal as lactic acid has formed. Lactic acid helps in the formation of butter from the cream.**

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“Going Further” Activities: Shake it Up, Churn it Out (Middle School)

Shake it Up, Churn It Out

What is churning?

Churning is the process of shaking up milk or cream to make butter.

How does churning make butter?

The fat in cream is surrounded by fragile membranes. As churning agitates the cream, the membranes “pop,” releasing butter fat inside. The fat can now congeal into a semi-solid form, separated from the liquid that was poured off during this activity.

The milk smelled sour at the beginning of this activity because while sitting at room temperature, lactic acid formed. **Lactic acid** helps break down the membranes, releasing the butter fat.

NOTE: It may be helpful for students to think of this like water balloons in a container. When the container is shaken, some of the water balloons will burst, releasing water. But if a handful of nails is put into the container before shaking it, the nails will break the surface of the balloons, causing more to burst. Lactic acid acts like the nails, weakening membranes of the “butter balloons.”



Is butter 100% fat?

No, 80% of butter is fat and 20% is milk solids and water. Butter is high in fat so it should be enjoyed in moderation.

What do churns look like?



Example of a “meshka,” one type of ancient butter churn made from animal skins (Arbil, Iraq).



A replica standing butter churn, common from medieval times until the Industrial Revolution (Image courtesy of Beaver Buckets Authentic Reproductions, www.beaverbuckets.com).



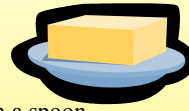
A barrel-type butter churn, used during the 19th century (Image by User Musphot on Wikimedia Commons).

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“Going Further” Activities: I Can't Believe I Made Butter Handouts (Elementary School)

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1. Put 1 cup whipping cream at room temperature in a tightly sealed jar
2. Shake for 10 minutes
3. Pour off liquid
4. Press as much liquid as possible out of the butter with a spoon
5. Wash 3 times with cold water
6. Add $\frac{1}{4}$ teaspoon salt and stir well



Q. How many cows does it take to screw in a lightbulb?



A. None – they can't because they all have butterfingers!

Butter Trivia

- It takes 39 cups of milk to make 1 pound of butter.
- Butter has been used as a food – and sometimes a medicine or cosmetic – for at least 5,000 years.
- The first butter factory in the U.S. was opened in 1848 in Goshen, New York.
- Butter is made up of 80% fat and 20% milk solids and water.
- Carotene, a form of Vitamin A, gives butter its yellow color.

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“Going Further” Activities: History of Butter (Elementary and Middle School)

A QUICK HISTORY OF BUTTER

- Butter has been used for more than 4,000 years.
- The first churns were made out of animal skins that were sewn tightly shut and suspended from wooden poles. Milk was poured into a small hole and the skin was rocked back and forth until the milk turned into butter (see picture on page 2).
- Butter has served as currency. Before butter became exclusively a food, it was often used in trade as American towns and cities grew. During World War II, Norway utilized a barter economy of which butter was one of the most valued “units of currency.”
- Several tubs of butter were brought to the New World by the Pilgrims.
- For many years, butter was only produced in the home. It was preserved with salt and packed into molds or tubs and stored in water-proof earthen containers in the family water well.
- During 1942-1957, butter was considered a food group (along with fortified margarine). The National Wartime Nutrition Guide, published in 1942, first categorized butter as such.
- In 1848, the first butter factory was established near Goshen, New York. Farmers brought their milk to this receiving station to sell it. The factory converted it to butter. From that humble beginning, the butter industry grew to become an important part of the dairy industry.

More Resources:

Making Cheese, Butter & Yogurt, by Ricki Carroll

The Butter Battle Book, by Dr. Seuss



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