

## Kitchen Science: Butter Up



*This activity is made possible thanks to funding from Cognizant through the Making the Future education initiative.*

### Tips

Were your hands and arms tired from all the shaking? Make this activity simpler by using a hand or electric beater instead.

For special occasions, take your homemade butter and press it into candy molds and refrigerate until hard.

If you want to speed up the manual churning process, add large marbles into your container before shaking the heavy cream. The marbles work as an agitator to help churn the butter a bit faster.

### New York Hall of Science

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Transform your kitchen into a learning laboratory. Use everyday materials, common ingredients and simple kitchen tools to help young learners develop important life skills and explore the wonders of science.

Making butter in a jar is a perfect family activity that is fun and easy, and might even save you money! All you need is one ingredient: heavy cream.

### What They'll Learn

- In this activity, youngsters will experiment with the phases of matter and learn about the characteristics of liquids and solids.
- Young learners will practice important mathematical concepts such as counting and measuring.
- Teaching young learners to read a recipe helps boost their literacy skills. They will develop letter and word recognition, increase their reading awareness, and enrich their vocabulary.
- Physical movements such as measuring, pouring and shaking provides young learners an opportunity to develop large and fine motor skills.

### What You'll Need

A small container with a lid, such as a baby food jar or mason jar

Heavy cream

½ cup measuring cup

Strainer

Toast or crackers (optional)

Spices or herbs for flavoring, such as cinnamon, garlic, salt, sugar, cocoa (optional)

Paper

Crayons

Stopwatch or regular watch (optional)

Upbeat dance music (optional)

### What to Do

Before you begin making butter, spend some time reading the butter recipe together.

Focus on speaking words slowly and clearly, then asking the child to repeat them.

Young learners may not be able to read an entire recipe, nevertheless, they can begin to recognize sounds, words and numbers.



### Let's Read Together

These books can help deepen your child's learning experience after making butter at home:

- Milk Comes From a Cow?*  
by Dan Yunk
- Pretend Soup and Other Real Recipes: A Cookbook for Preschoolers and Up*  
by Mollie Katzen and Ann Henderson
- Sopa de Frijoles/Bean Soup*  
by Jorge Argueta
- It Looked Like Spilt Milk*  
by Charles G. Shaw
- Arroz con Leche/Rice Pudding*  
by Jorge Argueta
- Butter (Foods We Eat)*  
by Susan Wake
- Bread and Honey (A Frank Asch Bear Book)*  
by Frank Asch

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1. Practice rewriting the recipe or making a pictorial representation of the recipe. Don't worry about messy handwriting or silly drawings. Remember, this is all part of early writing skills.
2. On a piece of paper, write the time you're starting the recipe, or set a stopwatch. You'll record the time once you're finished, too.
3. Measure and pour  $\frac{1}{2}$  cup of heavy cream into a container and cover it tightly.
4. Shake the container for about 10 – 15 minutes. Turn on some upbeat dance music to encourage your child to move their body while shaking the jar. Make it fun!
5. After about 2 – 3 minutes of shaking, open the container. You'll see that the heavy cream is starting to become frothy; this is whipped cream. Ask your child to make observations and predictions about what they see happening.
6. Close the container tightly and continue shaking. You will begin to feel and hear the clumps of butter forming inside the container.
7. After about 10 – 15 minutes, pour the mixture through a strainer, collecting the liquid in a separate container. This liquid is called buttermilk, which you can use in other recipes such as making pancakes or biscuits.
8. You now have butter! If desired, you can flavor the butter with different spices and herbs.
9. Spread the butter on toast or crackers and enjoy!
10. Track the time it takes to make butter from beginning to end. Will the results always take the same amount of time if you change a variable or use one of the suggested tips below? Test it out by making another batch of butter!

### What's Happening?

Heavy cream is a high-fat liquid that goes through a physical change when agitated. A physical change is a type of change where the form of matter (in this case, the heavy cream) is altered and takes on a different appearance (in this case, butter.)

When you shake the heavy cream, the fat molecules get shaken out of position and start to separate from the liquid. After enough agitation, the fat molecules smash into each other and begin to clump together, forming a solid, which is butter. The milky liquid left behind is called buttermilk.

### Questions to Ask

Prior to shaking the heavy cream, encourage your child to ask questions such as:

- What color is the heavy cream?
- How does it feel? Does it feel like milk?
- Where do you think heavy cream comes from?
- What does butter look like? How is it different from heavy cream?