

Families:

Pilot Light Family Meal Lessons are designed to easily bring food education into your home. We recommend using the Family Resources in the following way:

1. Watch the Family Meal video for the lesson as a family.
2. Make the recipe as a family.
3. In the Common Core Connections section, children can learn through and about food while strengthening Common Core English Language Arts or Math skills.
4. Family Discussion questions and Extension Activities are provided to allow learners of all ages opportunities to participate in the learning experience!



Pilot Light Family Meal Lesson
Homemade Butter
+ Grades 3-5 Common Core Math - Measurement and Data

Suggested Recipe Age Range: Kindergarten through adult

Recipe by Chandra Garcia-Kitch:

Homemade Butter**Ingredients:**

- Heavy Cream, brought to room temperature
- Salt
- Herbs, optional

Materials:

- Mason jar or airtight container that can be shaken without leaking
- Bowl
- Spoon
- Plastic wrap

Directions:

1. Pour the heavy cream into the jar until the jar is half full.
2. Screw the lid on tightly, making sure it will not leak.
3. Start shaking!
4. Continue shaking until the fat solids all come together in a ball.
5. Carefully remove the ball of butter from the buttermilk and put it in the bowl. (you can save the buttermilk for baking)
6. Using the spoon, gently push the butter against the bowl sides to remove any remaining buttermilk.
7. When the buttermilk is completely removed, pour it out.

8. Alternately, you can put the ball of butter in ice water and squeeze it, changing the water as it gets cloudy and repeating until the water stays clear when the butter is squeezed.
9. If you are adding any herbs, this is where you add them to the butter and mix them in well. If you used the ice method, this will take a bit more work.
10. Chill the bowl, covered with plastic wrap until the butter can be easily gathered into a ball or log.
11. When butter can be balled or shaped into a log, shape it and wrap it in plastic wrap.
12. Store in the refrigerator when not enjoying your homemade butter.

Common Core Connections:

Grades 3-5

CCSS.MATH.CONTENT.3-5.MD.A.2

Measure and estimate liquid volumes and masses of objects using standard units of grams (g), kilograms (kg), and liters (l). 1 Add, subtract, multiply, or divide to solve one-step word problems involving masses or volumes that are given in the same units, e.g., by using drawings (such as a beaker with a measurement scale) to represent the problem.

What does this mean?

The Common Core introduces the concepts of liquid volume and mass in the third grade standards for Measurement and Data. Students are expected to understand how to measure volume in relation to mass and apply this to word problems using the four basic operations - addition, subtraction, multiplication and subtraction.

Common Core standards for measurement progress from measuring volume to converting volume between units by 5th grade. This means that in third grade, your student could compare the initial liquid volume of the heavy cream to the final liquid volume of the buttermilk and create or solve word problems using these measurements. A fourth grade student should be able to measure the volumes accurately, using decimal or fractional parts. By the fifth grade, your student should be able to convert the volume of each from one measurement to another. For example, how many grams is the butter? How many kilograms would that be equal to?

In this lesson, you (the student) will be solving problems related to liquid volume.

What does this look like?

Materials needed:

- Pencils
- Paper
- Liquid measuring cup with increments marked in liters
- scale

Directions:

Third, Fourth and Fifth grades:

1. Solve each problem below and show your work:
 - a. Measure and record the liquid volume of the heavy cream and the buttermilk. How much volume was displaced by the milkfats that we turned into butter?

 - b. Imagine you started with 1 L of heavy cream. After you made butter, you had 1/2L buttermilk. How much of the liter of heavy cream was milkfat that became butter? Show how you know.

 - c. If each time you make butter, the buttermilk's liquid volume is $\frac{1}{2}$ the original volume of the heavy cream, how much heavy cream did you use for:
 - i. 1L buttermilk = _____ L heavy cream
 - ii. 2L buttermilk = _____ L heavy cream
 - iii. $1\frac{1}{2}$ L buttermilk = _____ L heavy cream
 - iv. 5 L buttermilk = _____ L heavy cream
 - v. $2\frac{1}{2}$ L buttermilk = = _____ L heavy cream

Fourth and Fifth Grades:

1. On a separate sheet of paper, create a data table and graph that show the relationship between heavy cream and buttermilk when making butter. Use the data you gathered when making butter.

Family Discussion Questions:

Families/children could discuss or write about:

- How did people make butter a long time ago?
- What are the changes that the heavy cream goes through as you make butter? Why do you think that happens?
- What happens when you add salt to butter and why?

Extension Activities:

Here are some suggestions for additional activities that relate to this recipe:

- Research the history of butter.
- Research uses for your buttermilk (pancakes are a good first start) and try a recip.
- Compare the taste of your butter to commercially produced butter. Does it taste different? Which one is more economical?

This original Family Lesson was written by Pilot Light Food Education Fellow, Chandra Garcia-Kitch.