raft® RESOURCE AREA FOR TEACHING

STEAM SCIENCE TECHNOLOGY ENGINEERING ARTS MATHEMATICS

LEARNING ACTIVITY

Homemade Butter

Use Simple Ingredients to Make Delicious Butter

Before the convenience of grocery store shopping, people had to make food products at home. Students will use the energy stored in their muscles to turn heavy whipping cream into butter in this activity!

Activity Challenge
Make homemade butter using simple ingredients at home.

Preparation
Review the Materials Needed list and gather materials.

To Do

1. Fill the container halfway with heavy whipping cream and securely tighten the lid onto the container.
2. Shake the container in all directions for 7 minutes. This can be tiring!
3. After 7 minutes, open the container, add 1/8 teaspoon of salt, and replace the lid.
4. Shake the container again for 7-10 minutes. Stop shaking when butter appears to be solid.
5. Strain the excess buttermilk and refrigerate. Put solid butter back into the container and enjoy! The butter will last 2-3 days when refrigerated.

Observations
How does the heavy whipping cream change as you shake the container? How long did it take the butter to form? How does the butter and liquid in the container look? What color differences did you notice during the shaking? What kind of energy did you use to shake the container? What happened to it?

Extensions

- Season the butter with pepper, garlic, dill or parsley and enjoy the butter with rolls made using RAFT's Yummy Rolls learning activity.
- Use a thermometer to measure the temperature of the cream when it is put into the glass container.

The Science behind the Activity
Shaking, or agitating, the heavy whipping cream causes the fat molecules to come out of position and clump together. When this happens, the fat separates from the liquid in the cream. The liquid can be removed, leaving only solid butter behind. Shaking the container to make butter takes energy, of which there are many forms. Heat (thermal energy), light (radiant energy), electrical, and physical (kinetic energy) are familiar kinds of energy. In this activity, **potential (stored) energy** gets turned into physical, or **kinetic energy**, (shaking of cream) and ultimately turns the cream to butter.

Materials Needed

- 1 cup of heavy whipping cream
- 16 ounce container (glass or plastic)
- 1/8 teaspoon salt
- Measuring cups and spoons
- Strainer
- Timer

Grade Range
K-2
3-5
6-8

Topics/Skills
Physical Science; Properties of Matter; Measurement

Learning Standards
NGSS: Physical Science; Energy
CCSS: Measurement and Data

Duration
30-45 minutes

Prep Time
5 minutes