# Science at Home

## Making Butter

### What You Need

1 cup heavy cream  1 mason jar (or other tightly sealed container)

### What You Do

1. Pour about ½ cup of heavy cream into your jar or container. Let sit on counter for 4 – 5 hours or until room temperature. Using cream directly from the refrigerator will take significantly longer!
2. Tightly seal your container and SHAKE! Take note of the time you start shaking, it will take several minutes of vigorous shaking to separate the butter from the cream.
   Safety First! Take extra caution if using a glass jar or other container that may break if dropped. Use a child-safe container and/or have younger children sit on a couch or other soft surface during their turn.
3. Take breaks every minute or two to observe how the cream is changing. Pay close attention to the sound it makes and how it feels when you shake the jar. Watch how the texture of the cream changes.
   Tip: Many hands make light work, so share this task with everyone! Turn on your favorite songs and make it a butter-shaking dance party!
4. Once a solid mass of butter has formed, pour the remaining liquid into a separate container and use as buttermilk. Rinse and gently knead your butter in cold water to remove the remaining buttermilk. Store in a clean sealed container in the refrigerator.

Questions to ask

- *What do you feel when you shake the jar? What do you hear?*
- *How long did it take for the cream to appear "whipped"? When did a solid clump form?*
- *Why do you think shaking the cream formed butter? Is there any other way this could be done?*

### What's the Science?

Did you know that people have been making butter for at least 4,000 years? Our methods of making butter may have changed, but the science behind it is still the same! Milk is primarily composed of water, fat, proteins, lactose and minerals. Milk fats are less dense than the water in milk, so they rise to the top forming a layer of cream that can be skimmed off – or removed. They milk typically found in a store has gone through a process called homogenization, in which the fat particles are broken apart in such a way that they will not rise to the top of the milk. When you shake the cream in your jar, the agitation causes fat molecules to clump together and separate from the rest of the liquid in the cream, forming butter.

### Try This

Use science vocabulary: Use related science words such as dense, skim, homogenization and molecule as you talk and play together. Children learn new vocabulary words when they hear grown-ups use them in context.

### Keep in Mind

- Children are natural scientists; let them lead the way in their experimentation! Encourage them to ask questions and make suggestions only when they are stuck/discouraged.
- The order suggested is not the only right or perfect way. Adjust the activity based on the age, ability, and interests of the children.

### Additional Resources

*Matter: See It, Touch It, Taste It, Smell It* by Darlene Stille
*Change It! Solids, Liquids, Gases and You* by Adrienne Mason

GLASS CITY RIVER WALL
AN URBAN SIGHT PROJECT
Bridging The Arts & Education

imagination STATION
pure science. pure fun.