

# Food Matters

## Summary

In the following activities, the students will experience seeing bread made and experience making butter. They will also see whether the product was produced by a physical or chemical change.

## Group Size

Small Groups

## Materials

Activity One Group--Making Bread--Physical Change (dough); Chemical Change (bread)

Pictures of process

Student journal

- [Notes on Making](#)

Store bread

Hand-made bread

Wooden spoon

Mixing pan

Measuring spoons

Measuring cup

Bread pan

Hot pad

Oven

Dish towel

Sugar

Salt

Yeast

Flour

Butter

Water

Activity Two Group--Making Butter--Physical Change

Pictures process

Student journal

- [Notes on Making](#)

Store butter

Hand-made butter

Pint jar with lid

Wooden spoon

Butter plate

Whipping cream

Salt

Cold water

## Additional Resources

### Books

*Colonial Living*, by Edwin Tunis; ISBN 9780801862274 (Paperback)

*If You Lived in Colonial Times*, by Ann McGovern; ISBN 059045160X (Paperback)

*If You Lived In Williamsburg in Colonial Days*, by Barbara Brenner; 0590929224 (Paperback)

## Background for Teachers

Cooking was one of the most important parts of colonial living. The colonists learned many ways to cook the same type of food so it didn't look the same each night. One of the highlights of the meal was bread. Bread was only made once or twice a week in an oven made in the wall of the fireplace. Maple sticks were put in the oven to burn to get the walls of the oven very hot. Once the walls were hot the ashes were scraped out and the dough was put in the oven. The bread would bake over night and the bread would be taken out in the morning.

There are two types of chemical changes here. One is the burning of the firewood. The other, is the dough changing into bread.

Another commodity that was made and used extensively by colonists was butter. Butter was not only used on bread, but used for all types of cooking and put on food to eat. It made food taste good.

Changing cream into butter is a physical change.

In the following activities, the students will experience seeing bread made and experience making butter. They will rotate to the two stations and make the products or observe the products being made. They will experience how colonial people made bread and butter. Students will personally make some of these products from raw matter, and some will be made by a teacher demonstration for the purpose of safety. Each student will keep a record in a journal about how each product was made and what they discovered. They will also see whether the product was produced by a physical or chemical change.

## Intended Learning Outcomes

1. Use science process and thinking skills.
2. Manifest science attitudes and interests.

## Instructional Procedures

### Invitation to Learn

Hand out a store-made sugar cookie to each class member. Ask the students where the cookie came from. (They will probably say that it came from a store.) Ask the students where the store got it. (They will say from a cookie factory for they have probably visited one before.) Then ask them, how did they make the cookie? (They had different ingredients that they put into the cookie.)

Draw a big pot on the board. Have the students name all the ingredients that went into the cookie (sugar, milk, eggs, vanilla, flour, baking power, etc.). Write the words in the pot on the board. Ask the students, as the ingredients are being mixed, what does it turn into? (Cookie dough) Then ask them that even though we can't see any of the ingredients, are they all still in the cookie dough? (Yes) In fact, it is possible that a chemist could analyze the cookie dough and actually tell us what was in the dough because it is still in there. What kind of change is this called when we just mix things together but the substances still exist? (A physical change.)

But, we don't want to eat cookie dough. We want a cookie. What do we do to make a cookie out of cookie dough? (It is baked in the oven with heat.) When we take the cookies out of the oven, are they still a mixture of sugar, milk, eggs, vanilla, flour, and baking powder? (No) Why not? (They have gone through a chemical change.) What does a chemical change mean? A chemical change is a process where one type of substance is chemically changed into a totally different substance. Usually, if heat is used it is a chemical change. Heat melts substances and combines them with other substances. Sometimes things fizzle, give off heat, and change into a new substance that feels different. Chemical changes occur every day all around us, especially when we are cooking.

"Today we are going to look at two foods that are made everyday to see what type of change they go through. We will split you into two groups."

### Instructional Procedures

Activity One Group--Making Bread--Physical Change (dough); Chemical Change (bread)

## Pre-activity

Have students take out their journals for the review.

Review what the students learned about how colonists made bread.

Discuss how colonists found the materials for making bread.

Show pictures of the colonists making bread and the oven they used. Have a discussion about them.

Pass out the activity sheet *Notes on Making* \_\_\_\_\_. (Have students write *Bread* on the line.)

Have the students write the tools needed to make bread. Explain why each is needed and have them write the reasons.

- a. Wooden spoon (for stirring)
- b. Mixing pan (for mixing the ingredients)
- c. Measuring spoons (to measure out small measurements)
- d. Measuring cup (to measure out large measurements)
- e. Bread pan (for baking the bread dough in)
- f. Hot pad (to handle the hot pan easily)
- g. Oven (to bake the bread in)
- h. Dish towel (to put over the dough while rising)

Have the students write down the ingredients needed to make bread. Explain why each is needed and have them write the reasons. Weigh out each ingredient and record the weight.

Have the students put on their safety glasses.

- a. Sugar (to sweeten the bread)
- b. Salt (to give the bread flavor)
- c. Yeast (to make the bread rise)
- d. Flour (main substance of the bread)
- e. Butter (to give the bread flavor, helps it bake better)
- f. Water (helps mix the ingredients together)

## Making the Bread Dough

Since the students are watching, have them write down the procedure as they are listening.

In a small bowl, put 1 cup of luke-warm water and 2 teaspoons of yeast. Let it sit for a moment to fizz up.

Measure and stir into the mixing pan the items below and stir them in.

- a. The bowl of water and yeast
- b. 2 teaspoons butter
- c. 2 tablespoons sugar

Put 3 cups of flour and 1 teaspoon of salt into the pan and mix with wooden spoon.

Stir until you can knead the dough with your hands. Knead at least 100 times. Gather all loose flour in the pan into the dough in the kneading process. (Colonial mothers found that the more times they kneaded the dough, the better tasting and better looking their loaves would be.

Kneading makes it light weight and gives it a fine texture.)

Cover the pan with a dish towel and let it rise for 30 minutes.

Knead the dough again until all the air is kneaded out.

Put dusting of flour on your hands so dough won't stick.

Form into a loaf. Shape carefully.

Butter the bread pan and put the dough in it. Let it rise for 15 minutes.

Ask them, "What type of change is this? Why? (Physical change--the ingredients are just mixed together.)

Weigh the dough. Compare it with the weight of the ingredients.

Have the students write down on the activity sheet what kind of a change it is, and tell why.

## Baking the Bread Dough

Preheat the oven at 350 degrees.

Put the pan into the oven when the oven has preheated. Bake for 20 to 30 minutes or until the bread is well browned.

Take out the bread and turn the pan upside down to get the bread out.

What type of change did the bread go through? Why? (Physical change because it was heated and a new product was made.)

Weigh the bread and compare it to the weight of the dough. Why did it change? (It lost moisture.)

Have the students write down the uses of the bread dough by the colonists.

Have them write down any special observations and thoughts while they were making the candles.

Have the students write down on the activity sheet what kind of a change it is, and tell why.

For safety reasons, have store bought bread for the students to eat.

Can have jam and butter available if desired.

## Activity Two Group--Making Butter--Physical Change

### Pre-activity

Have students take out their journals for the review.

Review what the students learned of how colonists made butter.

Discuss how colonists found the materials for making butter.

Show a picture of the butter churn, cream bucket, butter bowl, butter mold. Have a discussion about them.

Pass out the activity sheet *Making* \_\_\_\_\_. (Have them put *Butter* on the line.)

Have the students write the tools needed to make butter. Explain why each is needed and have them write the reasons.

- a. Pint jar with lid (used to shake the cream)
- b. Wooden spoon (to take the butter out of the jar)
- c. Butter plate (to put the butter on)

Have the students write down the ingredients needed to make soap. Explain why each is needed and have them write the reasons. Weigh out each ingredient and record the weight.

- a. 12 pint (liquid) whipping cream (main substance to making butter)
- b. Salt (to preserve the butter and give it flavor)
- c. Cold water (to separate the buttermilk from the butter).

### Making the Butter (To be done in a clean area.)

Wash hands.

Break up the students into groups of 4 to 6

Pour the 12 pint of the liquid whipping cream into a pint jar. Screw on the lid.

Group of students take turns in shaking the jar (20 time each student until done).

It takes quite a while for the liquid whipping cream to turn into butter. The liquid whipping cream will first turn into whipped cream. This is the stage right before it turns into butter. The students may think this is the end. But, they have to keep shaking a little longer for the whipped cream to turn into butter.

It has turned into butter when the whipped cream has turned into liquid (buttermilk) and a glob of butter in the jar.

Pour the buttermilk out of the jar and into a cup. (Hold the lid of the jar over the opening, leaving a gap to pour out the buttermilk but keep the butter in the jar.)

Add cold water to the jar. Press the cold water into the butter with the wooden spoon to flush out the remaining buttermilk in the butter so the butter doesn't go rancid. Pour the water out in the sink as described in #7.

Add a pinch of salt to the butter and stir it with the wooden spoon. This will prevent it from going rancid and will add flavor.

Take the butter out of the jar with the wooden spoon and put it on a butter plate.

Weigh the butter and buttermilk and compare it to the weight of the cream. Did it change?

Explain.

Ask the students what type of change did it go through? Explain. (Physical, because the butter only changed form but is made up of cream in another form.)

Have the students write down the uses of the butter by the colonists.

Have them write down any special observations and thoughts they had while they were making the butter.

Have the students write down on the activity sheet what kind of a change it is, and tell why.

## Extensions

### Curriculum Extensions/Adaptations/ Integration

The advanced learners can learn more about how cooking most things is a chemical change.

The advanced learners can learn more about the tools used in the activities and about how they were made.

The advanced learners can learn more about the physical and chemical reactions of each of the activities.

The advanced learners can learn about other products that were made by colonists--how they are made and if the product is a result of physical or chemical change.

For learners with special needs, there are many easy reader books in the library that tell about colonial living. After they read them, have them write if the product is a physical or chemical change.

### Family Connections

Send home the instruction sheets about how to make bread and butter. Have them make them at home with their family. The student can then explain if the products are chemical changes or physical changes and explain why to their family members.

## Assessment Plan

Review the students' activity sheets. Check for accuracy and completeness.

Take pictures of the students at each of the activities. As the pictures are shown, have the students relate what is happening at each station. Have them relate whether it was a physical change or a chemical change.

Make an assessment with each of the products of the two stations with pictures. Have the students tell if each product is a result of a physical change or a chemical change. Have them explain why.

## Bibliography

### Research Basis

Armstrong, T. (1994). *Multiple intelligences in the classroom*. Alexandria, VA: Association for Supervision and Curriculum Development.

Multiple intelligences let students choose a method of learning in connecting one subject to other subjects to their world. The integration of instructional methods focuses on teaching a standard in one curricular area and matching it to a standard in another curricular area such as integrating science with language arts, math, math, or social studies. As educators teach with this idea in mind it helps students see a connection between subjects relating to the real world. It helps students understand their world better to see how subjects relate to each other. This method puts into practice the teaching of multiple intelligences.

Ketch, A. (2005). Conversation: the comprehension connection. *The Reading Teacher*, Vol. 59, No. 1, pp. 8-18.

Students who engage in conversation in the classroom become reflective thinkers. Conversation brings meaning to students as they contemplate to understand our complex world. Conversation is the comprehension connection. There are literature circles, book clubs, whole-class discussions, pair-share, small-group discussion, and individual conferences that help in conversation comprehension.

Authors

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