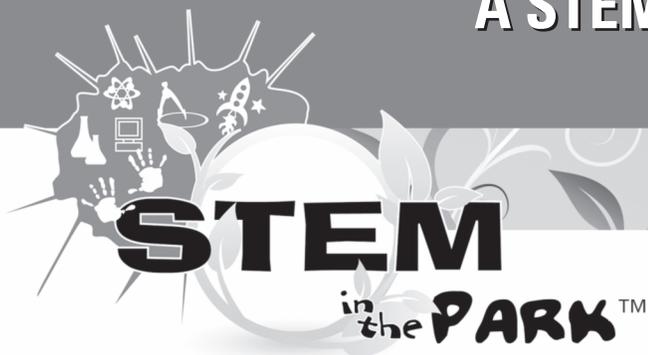


A STEM in the Park

Take Home Activity



Science, Technology, Engineering, and Mathematics

Science in the History Kitchen

In pioneer days, many of the foods we now buy in the store were made at home. You couldn't just go to the store to buy your bread or butter or candy; your family had to grow and make the foods needed to survive. Did you know you can make some of those foods at home today with your family AND turn it into a tasty science lesson?



Butter

Butter comes from cream; cream is the layer of fatty liquid that rises to the top of fresh milk. Cream has a lot of fat molecules. When those molecules are agitated (shaken or churned), the fat molecules collide and clump together. The longer the liquid is agitated the larger the clumps until finally you have butter!

To make butter at home

All you need is a jar with a tight fitting lid and heavy cream. Pour the cream into the jar. Tightly screw on the lid and shake! At first you'll hear the liquid sloshing around. After a while, you'll hear less liquid moving; that means you've started to turn the cream into whipped cream. Keep shaking! After a while the fat molecules will keep clumping together until finally they are all stuck together. That is the butter. There will be some clearer liquid left. You can drain off the liquid and try out the butter on crackers or bread. Make sure to store the butter in the fridge. It will not last as long as the butter you buy in a store today so enjoy it quickly. Note: You can make larger batches of butter in a stand mixer! Try making the butter with cold cream and then room temperature cream. How does that change the process?

In pioneer days, families made butter as needed. How it tasted and looked depended on what the cows were eating at the time. Sometimes finely grated carrots were added to the butter to improve the color or a little salt might be added to improve the taste.

Bread

You wouldn't be able to enjoy your favorite sandwich on a thick slice of bread if it weren't for science. Breads can either be flat like Matzo or Lavash or raised (or leavened) like sandwich bread. Leavened breads get their fluffy insides due to a chemical reaction between the flour and the leavener. Leaveners can be chemical (baking soda or powder) or natural (yeasts). In both cases, the leavener reacts with the other ingredients to produce carbon dioxide. The carbon dioxide causes the bread to rise and expand.

So the next time you sit down to a PBJ or Grilled Cheese or even a hamburger on a bun, you can thank science!

Try making a basic bread recipe at home. There are many easy ones on line or in cookbooks. Baking bread is fun and easier than you think! Your fresh butter will taste great on your own baked bread.

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Candy

Everyone loves candy and candy has been made at home for centuries. Rock Candy is one of the simplest and oldest versions of this sweet treat. Doctors used to put medicine on rock candy to hide the bitter taste of the medicine. Rock Candy is really just sugar that has been dissolved in water and allowed to reform in large crystals. When you mix the sugar into the boiling water, you create a super saturated solution meaning there is more sugar than can be dissolved into the water. Over time the liquid cools and evaporates. The sugar recrystallizes forming the rock candy.

To make rock candy at home you need:

- 2 Cups water
- 4 Cups of Sugar
- A medium sauce pan
- Wooden spoon
- A heat safe glass jar (like a mason jar)
- String or wooden skewer (If using a string, you will also need a weight like a metal washer to tie to the end)
- A Pencil or Clip Clothes pins that fit across the top of the jar.

NOTE: Please have an adult help you since you will need to cook the mixture over heat. The liquid will be hot.

1. Pour water into saucepan and bring it to a rolling boil over medium heat.
2. Add sugar and start stirring.
3. Continue stirring until the sugar has entirely dissolved. Be patient. This may take several minutes. Be sure to wait until most of the sugar has dissolved. You should see very few crystals of sugar in the water.
4. Take off heat and allow to cool while you prepare the jar and string or skewer.
5. If using string
 - a. Cut String so that it is long enough to reach the bottom of the jar and still have enough to tie the end to a pencil
 - b. Tie one end of the string to a Pencil and tie the washer to the other end.
 - c. Continue to step 7 below.
6. If using a skewer:
 - a. Make sure the skewer is long enough to reach the bottom of the jar.
 - b. Use clip style close pins and attach one on each side of the skewer so that they will rest on top of the jar and hold the skewer up right in the middle of the jar.
 - c. Continue to step 7 below.
7. Pour the liquid carefully into the jar.
8. Dip the string or skewer into the liquid several times and take out. Allow to dry overnight on a piece of wax paper. This step is very important. This will allow the seed crystals to form. The seed crystals will be needed for the other crystals to attach to.
9. The next day, put the skewer or string into the solution in the jar and let it set for several days at room temperature. It takes patience but as the water evaporates you'll see more and more crystals form. In about 7 days you should have a nice collection of sweet crystals to eat.

This activity is brought to you by the Sylvania Historical Village

