



Dear Workshop Participant(s),

As part of COSI's new model of Family Workshops, we want to encourage further exploration by providing some basic background information and an activity related to the topic of your upcoming workshop. We want you to feel comfortable and encouraged to co-teach with the COSI instructors.

At COSI we see every caregiver as the natural teacher for their child; therefore, you are your child's first and best teacher. They have already learned so much from you: how to smile because you smiled at them, how to talk because you talked to them, and they learn more from you every day. They will learn to lead an excellent life because you led one first and that education is important because you value it.

Do you remember show-and-tell? Children come to class with their treasures cupped in their hands and can't wait to show their classmates. Likewise in the home, kids aren't as interested in what you have to say; they are much more interested in what you have to show them.

We hope that you will find the background information and related activity engaging and fun to try at home. This information can be found on the following web page underneath the workshop description: www.cosi.org/familyworkshops. We hope these will help prepare you and your child for your family workshop visit to COSI. We look forward to seeing you soon at your family workshop.

Sincerely,

The Family Workshop Team

Popcorn Science

Primary Audience: Families

Description: Participants use popcorn to observe the effect of heat on molecules of water.

Keywords: Pressure, Heat, Popcorn

Concepts:

- Heat causes molecules to expand. An example is when water is warmed to the point of boiling and eventually becomes steam. This steam takes up more room than water.

Materials:

- Per Demonstration:
 - Bag of Microwave Popcorn

Instructions:

Place the bag of popcorn in the microwave for the appropriate amount of time listed on the instructions. Watch as the heat from the microwave causes the kernels to pop.

Possible Interactive Questions:

- Why do you think the kernels pop with heat?

What's Going On?

Have you ever wondered about what would happen if you put uncooked kernels of corn from corn on the cob into the microwave? Would they pop and make great popcorn? The bad news is that they would just make a mess of your microwave. The good news is that popcorn, whose proper name is popping corn, is a special breed of corn that will explode to 30-40 times its original size when you heat it.



Only popping corn will pop. The secret to its pop is a drop of water found in each kernel. Popcorn is approximately 20% water. The kernel is really the seed of a new corn plant, and the moisture inside helps keep it alive until condition is right for it to grow. The moisture is also what makes the corn pop. If each of the kernels is heated quickly, the drop of water turns to steam, just as water boiling in a pan turns to steam. The steam produces a lot of energy. The energy breaks open the hard kernel surrounding the internal part, and out pops the popcorn!

Further Exploration:

1. Try an experiment with different amounts of moisture inside of the kernels. First, place $\frac{1}{2}$ cup of popcorn on a cookie sheet and leave in an oven at 200 F for 60 minutes. Next, place $\frac{1}{2}$ cup of popcorn in a bowl with 1 cup of water for 60 minutes. After 60 minutes, drain the popcorn in a colander. Lastly, leave $\frac{1}{2}$ cup of popcorn in a plastic bag for 60 minutes. Pop each of the three batches separately. Which batch of popcorn made the biggest kernels of popcorn? Which batch made the smallest? Why? (*More moisture equals more steam for popping the kernel.*)