Safe Plates Mad Science Experiments

Tiny Microbes vs. Oxygen

Introduction:

Tiny microbes can be everywhere, and often like to hang out on food. Some tiny microbes are good guys, and help make things like bread, cheese and yogurt. Some are mischievous and just make food look, smell, taste or feel strange. We call those ones spoilage microbes. Still others are the bad guys that will make you sick. Those are called pathogens. Pathogens are really sneaky and often don't change the way food looks, tastes or smells. But, they do often hang out in the same places and grow in the same conditions as the spoilage microbes.

There are lots of ways to stop the spoilage microbes from making food taste strange and stop pathogens from making you sick. One of those ways is with oxygen. Just like people need oxygen to survive, most bacteria and fungi also need oxygen to survive. If you take oxygen away, many of those things can't grow, which helps some foods keep longer before tasting or smelling bad.

Materials:

- Two clear plastic or glass containers with lids (canning jars, storage containers, even plastic zip bags)
- Two pieces of sealed cheese (like a cheese stick or snack cheese)

Instructions:

1. Find your containers and make sure they are clean and dry
2. Leave one piece of cheese wrapped and place in a container. Unwrap the other piece and place in the other container.
3. Close the lids on the containers and leave out at room temperature for a few days. What differences do you see?

For Teachers/Parents:

- Have students fill out the observation sheet with what they are expecting will happen (this is called a hypothesis.)
- Every day or every other day, have students check in with their experiments and see what is actually going on. Students should write down descriptions of what they see and smell (this is called data collection.)
- For older students, have them research what microbes might be causing the changes they see.
- **For safety reasons, students should not touch or taste experiments. Those allergic to mold should not smell experiments.**

Debrief:

At first, you may not see any changes at all in the pieces of cheese. Depending on the variety of cheese it might become shiny, but that is due to the higher heat at room temperature and some of the fat rising to the surface. Eventually you should see fuzzy spots on the unwrapped piece, which is mold. Different colors and shapes of mold colonies mean there are different types of mold present. Many of these types of mold have possibly been in your home or come from outside.

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safe plates

Tiny Microbes vs. Oxygen Observation Sheet

Name: **Date:**

Hypothesis (What do you think is going to happen?)
What do you think might change? What will the experiment look like after two weeks? Write or draw what you think will happen.

Results (What actually happened)
Write or draw what is happening with your experiment. What does it look and smell like? Please do not taste the experiments

Day 1	
Day 2	
Day 3	
Day 4	
Day 5	

Day 6	
Day 7	
Day 8	
Day 9	
Day 10	
Day 11	
Day 12	
Day 13	
Day 14	