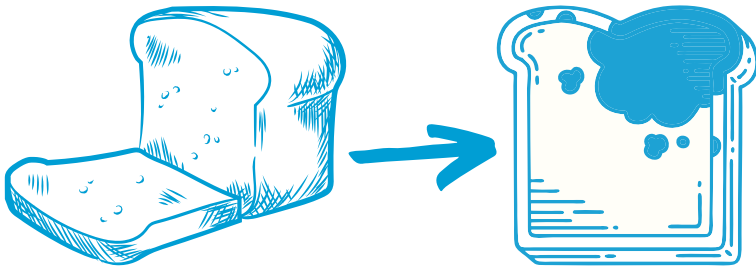


## ACTIVITY 3: WHEN BREAD GOES BAD



*Image Credit: Gary Abud, Jr.*

Many of us have encountered a moldy slice of bread, but what is going on when bread goes bad and what factors contribute to the molding of bread? The purpose of this experiment\* is for students to investigate factors that affect mold growth on bread.

Do different kinds of bread mold at different rates? If you put bread in the fridge or freezer, as opposed to leaving it out on the counter for several days, will one mold faster than the other? What other factors are associated with faster molding of bread?

### Possible Factors to Test:

- preservative vs. preservative-free bread
- temperature (fridge vs. out on the counter)
- types of bread (white, wheat, rye, etc.)
- surface area – loaf bread vs. sliced bread
- closed container (sealed bag) vs. open container (unsealed bag) vs. no container

### Experimental Design & Setup:

First, explain to students that they are going to be researching the factors that affect the speed of mold growth using bread. Ask for a show of hands—how many have seen moldy bread before? Have them turn and talk with a partner about what happened, how long it took for the bread to mold, and what they noticed with the moldy bread they saw.

Then, elicit some student responses about their conversations and, through a group discussion. Generate a list of possible factors that may contribute to mold growth on bread. Guide them to consider all the **Possible Factors to Test** if they do not come up in discussion.

Next, have students choose with a partner which of these factors they think they could design an experiment to test and ask them to create a procedure for how to do so. Engage the group in a discussion to share some ideas of possible test steps that could be performed to see how different factors affect the speed of mold growth on bread. Encourage them to come up with a hypothesis before testing.

Last, support the students to conduct their experiments, over a number of days to take data, by providing supplies or equipment as needed and giving them time in class to plan and carry out their tests as well as collect data. Once experiments are done and data is collected, have students summarize their findings in a poster presentation (either using large dry erase boards, chart paper, or a digital slidedeck-making tool.) Provide time in class for students to share and discuss their results. Facilitate a group discussion to help the group arrive at consensus about which factors most affect the speed of mold growth on bread based on analysis of group results.

*\*Note: The structure of this experiment allows for an inquiry-based approach where students design their own experimental procedures and methods of data collection—with the support of the teacher—but could also be adapted to a more prescribed stepwise format of conducting the experiment (e.g., teacher-directed with procedure given) as needed.*