

Bread Mold Experiment

8th Grade General Science



Overview	The purpose of this lesson is for your students to implement the scientific method in an experiment testing the effect of temperature on mold growth, while using the web 2.0 application Backpack to organize research, hypotheses, collected data, and results as well as compare collected information to that from other students.
Objective	After drawing conclusions about the effect of light and temperature on bread mold growth, students will be able to knowingly complete an experiment evaluation on Backpack answering the questions: <ul style="list-style-type: none">• What were the independent variables of this experiment?• What were the dependent variables of this experiment?• What effect did temperature have on mold growth?• Was your hypothesis for this experiment accurate?• What do you think would happen if you increased or decreased the amount of water added to the bread?
Standards	Indiana Education Standards (8 th grade science) http://dc.doe.in.gov/Standards The Nature of Science and Technology 8.1 Students design and carry out increasingly sophisticated investigations. They understand the reason for isolating and controlling variables in an investigation. They realize that scientific knowledge is subject to change as new evidence arises. They examine issues in the design and use of technology, including constraints, safeguards, and trade-offs. Scientific Thinking 8.2 Students use computers to organize and compare information. They perform calculations and determine the

	appropriate units for the answers. They weigh the evidence for or against an argument, as well as the logic of the conclusions.
Materials	<ol style="list-style-type: none"> 1.) Bread-(one consistent brand and type), enough for each group of two students to have two pieces. 2.) Squirt Bottles filled with water-one for each group. (if you don't have enough, it is easy for groups to share one) 3.)Refrigerator 4.) Area such as a large drawer, box, or cabinet with no light to store experimental bread that is not in the refrigerator 5.) Computers with internet access for students to research and store information on Backpack and printer access 6.) Rulers for each group 7.) Balances to weigh the bread 8.) Paper plates (2 per group) 9.) Black Sharpie
Procedure	<p>You should allow a week worth of class time to complete this lesson plan, with different days of the week requiring more or less class time dedicated to the procedure.</p> <p>Before students start on project you need to:</p> <ul style="list-style-type: none"> • Set up a Backpack account with a plan allowing enough users for all of your students to have access • Set up your student's accounts and login/password in order to cut down on class time • Purchase materials • Create Experiment Evaluation document on word and upload it to a "Page" that you create on Backpack <p>Day 1- (30-45 minutes) Have students access their Backpack account and research causes of mold growth using the internet. They should then post and cite the information they find as a "Page" labeled with the students' names on Backpack. After they have done this, give each pair of students two pieces of bread to leave out over night after misting the bread with water. (this will allow the bread to be exposed to spores)</p> <p>Day 2- (approx. 30 minutes) Have students make a hypothesis of the effect temperature will have on mold</p>

	<p>growth based on their previous research. Have them do this on their “Page” as a “Note”. Also, have students use the “Divider” feature to divide the days in which they post to Backpack. (Day 1, Day 2, etc.). Also have them make observations and post these observations as a “List” under Day 1. (color, size, weight) and any additional observations they may come across. Students will then label both paper plates with their names and place one plate with one piece of bread in the cabinet or dark area you provide, and the other in the refrigerator.</p> <p>Day 3-5- (20 minutes) Have students make same observations (color, size, weight) for the bread at room temperature and the bread in the refrigerator and post these observations on Backpack as they did the day before, dividing observations by Days. On each of these days, have students spray both pieces of bread with water and put the bread back in the dark area and the refrigerator.</p> <p>Day 6 (after the weekend)- (45-60 minutes) Have students take their final observations as they have previously done on Backpack. Then have students look at the other groups’ “Pages” on Backpack to compare their observations and results. Students should then complete the Experiment Evaluation exercise that you will have created.</p>
<p>Evaluation</p>	<p>Have students open the Experiment Evaluation document on your Backpack “Page”, answer the questions, print it out, and turn it in to you to grade.</p> <p>Students should write a short paragraph answer to each of the following questions:</p> <ol style="list-style-type: none"> 1.) What were the independent variables of this experiment? 2.) What were the dependent variables of this experiment? 3.) What effect did temperature have on mold growth? 4.) Was your hypothesis for this experiment accurate? 5.) What do you think would happen if you increased or decreased the amount of water added to the bread? 6.) How do your observations and results compare to your classmates? Why do you think there are differences?