

Pre-Lesson 1: Bread Mold Investigation Setup

Tab 1: Overview

Students set up an investigation in preparation for the *Decomposers* Unit. Bread and mold will be ready to use in about seven days.

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Guiding Question

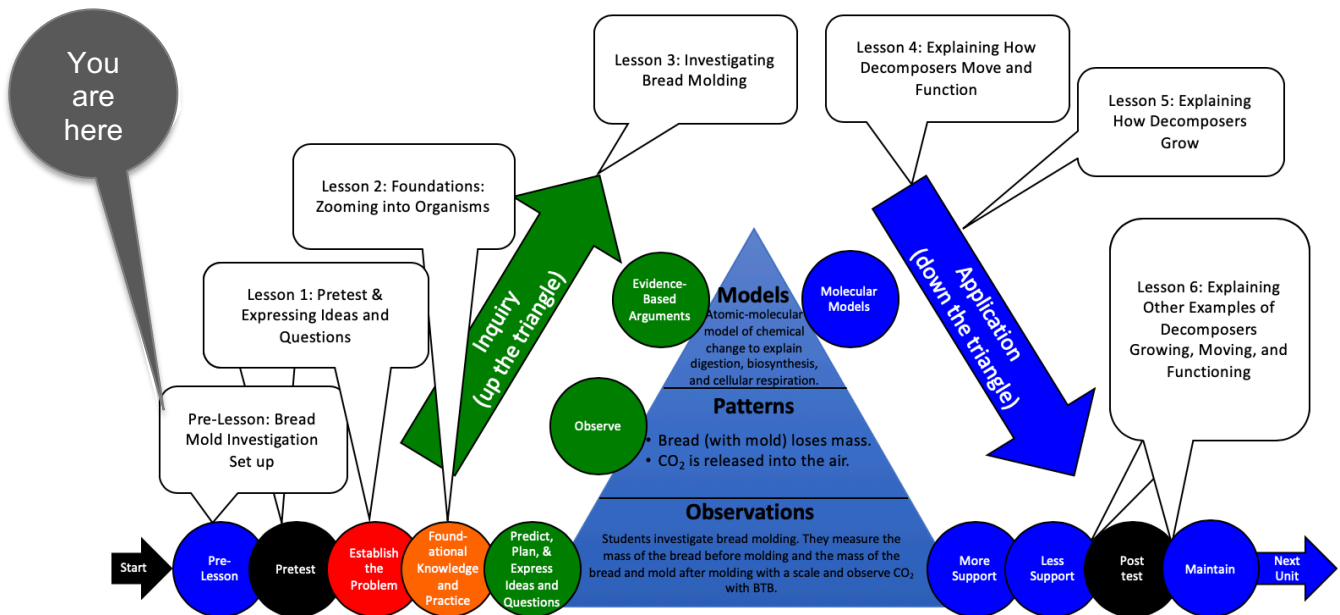
What happens when bread molds?

Activities in this Lesson

- Pre-Activity 0.1: Investigation Set Up (30 min)

Unit Map

The *Decomposers* Unit



Tab 2: Learning Goals

Target Performances

Activity	Target Performance
Activity 0.1: Investigation Set Up	Students will make initial measurements of the combined mass of a slide of bread and a Petri dish and leave the bread to mold.

NGSS Performance Expectations

This lesson helps students start thinking about all of the unit NGSS performance expectations but does not feature a mastery of any of them.

Tab 3: Background Information

Three-dimensional Learning Progression (accordion)

Pre-Lesson should be conducted at least seven days before you plan to begin the Decomposers Unit.

Key Ideas and Practices for Each Activity (accordion)

In Pre-Activity 0.1, students set up an investigation that allows them to measure mass change in moldy bread over the course of a week. This sets the stage for students to be able to ask questions about what is happening to matter and energy during the decay process. Note: Bread that appears to have no mold growing on it might actually have mold that is invisible to the naked eye. Students may have initial ideas about the Three Questions for moldy bread, which will be recorded in Lesson 1.

A note on mass and weight: Grams and kilograms in the SI (metric) system are units of mass—the amount of matter in a system. On the other hand, pounds and ounces in the English system are units of weight—the force of gravity on a particular mass. As long as gravity doesn't change, these units are interconvertible: The force of gravity on a 1 kg mass is about 2.205 pounds. Since most American students are more familiar with the English units of weight, we sometimes use “weigh” and “weight,” especially when encouraging students to express their own ideas. When referring to measurements in grams, we use “mass” as both a verb and a noun.

Content Boundaries and Extensions (accordion)

Pre-Activity 0.1: Investigation Set Up (30 min)

Tab 1: Overview and Preparation

Target Student Performance

Students will make initial measurements of the combined mass of a slice of bread and a Petri dish and leave the bread to mold.

Materials You Provide

- Bread slices (4 per group of students)
- Digital Balance (1 per group of students)
- Labels for Petri dishes (4 per group of students)
- Permanent marker (1 per group of 4 students)
- Petri dishes with lids (4 per group of students)
- Roll of tape (1 per group or class)
- Spray bottle with water for misting the bread (1 per group or class)

Resources Provided

- [Pre 0.1 Bread Mold Investigation Set Up Worksheet](#) (1 per student)

Recurring Resources

- [Bread Mold Class Results 11 x 17 Poster](#)
- [Bread Mold Class Results Spreadsheet](#)

Setup

Prepare the bread, spray bottles, Petri dishes, labels, digital balances, and markers. Print one copy of [Pre 0.1 Bread Mold Investigation Worksheet](#) for each student. Print one copy of the [Bread Mold Class Results 11 x 17 Poster](#) or prepare a computer and projector to display [Bread Mold Class Results Spreadsheet](#).

Tab 2: Directions (*accordion for individual steps in directions*)

<p>1. Introduce the unit to students.</p> <p>Tell students that in a week from now, they will begin to study how things decay. To prepare for that, they will set up the investigation by putting bread in Petri dishes, recording data, and keeping the bread in a warm, dry place for a week.</p>
<p>2. Divide students into groups of four.</p> <p>Give each student a copy of Pre 0.1 Bread Mold Investigation Set Up Worksheet. Tell them that they will use these to record their data now and also in a week, so they should be sure to keep track of their worksheets.</p>
<p>3. Demonstrate the investigation set up.</p> <p>Demonstrate the set up for students, making sure they understand how to use the digital balance to determine the mass of their Petri dishes. Use the Pre 0.1 Bread Mold Investigation Set Up Worksheet to guide your demonstration. Note: <i>Mass</i> is a measure of how much matter is in a system, <i>weight</i> is a measure of the gravitational pull on that system.</p>
<p>4. Have students set up the investigation.</p>

Have students set up their investigation by following the steps in the [Pre 0.1 Bread Mold Investigation Set Up Worksheet](#). Students should check off each step of the investigation when they have completed it. The worksheet includes instructions on where and how to record data. This involves:

- Each student preparing one Petri dish with bread sprayed with water;
- Each student labeling the Petri dish with his/her name;
- Each student finding and recording the mass of his/her Petri dish on his/her worksheet.
- Each student calculating the total mass for his/her group's bread and Petri dishes.

5. Have students record each group's data on the poster or spreadsheet.

Students can record their data in one of two ways: in the [Bread Mold Class Results Spreadsheet](#) or on the [Bread Mold Class Results 11 x 17 Poster](#). We recommend using the spreadsheet if possible because it will automatically calculate mass loss and also generate a graph of the data.

- **Spreadsheet Option:** Project the spreadsheet and open Tab 1 – Individual Data. Ask individuals to report the mass of their individual Petri dish and bread. As data are added, the spreadsheet will automatically populate the data on Tab 2 – Group Data and Averages.
- **Poster Option:** Alternatively, students can record their data as a group on [the Bread Mold Class Results 11 x 17 Poster](#), which can be posted on the wall. Students will have their group's total mass on their worksheet.

6. Have students store their bread and Petri dishes in a warm, dry place.

Tell students that they will revisit their bread in a week to look for changes. Until then, they should store their worksheet and bread in a place where they can find them easily in a week.

Tab 3: Assessment

Use the [Bread Mold Class Results 11 x 17 Poster](#) or the [Bread Mold Class Results Spreadsheet](#) to evaluate students' success at measuring mass changes in their bread and Petri dishes. Make sure that students have recorded the mass of their individual Petri dishes and bread as well as their group's Petri dishes and bread on their worksheet before moving on.

Tab 4: Differentiation & Extending the Learning

Differentiation (Accordion)

Modifications (Accordion)

Use Tab 3 – Daily Log of the [Bread Mold Class Results Spreadsheet](#) to have students keep a daily log of the mass of their Petri dish and bread. This will allow them to observe mass loss each day and may help them identify the pattern of overall mass loss more easily.

Tips

Store the Petri dishes and bread together in a warm, dry place and make sure they are all labeled before the end of the class.

Extending the Learning (Accordion)

Students may be interested in keeping photo documentation of their moldy bread to accompany the data they collect.