

Name _____

The Great Pumpkin Decomposition Investigation

Objective:

Students will investigate how different environmental conditions affect the decomposition rate of pumpkins and learn about decomposition's role in nutrient cycling.

Key Science Concepts

- **Decomposition:** The process of organic materials breaking down
- **Variables:** Understanding independent, dependent, and controlled variables
- **Ecosystems:** How decomposition contributes to soil health
- **Data Collection:** Making consistent observations over time
- **Microorganisms:** The role of bacteria and fungi in breaking down materials

Materials Needed

- 4 small pumpkins (or large pumpkin pieces)
- 4 clear plastic containers with lids
- Soil (enough to partially cover pumpkins)
- Water spray bottle
- Measuring cups
- Magnifying glasses
- Digital thermometer (optional)
- Science notebooks or recording sheets
- Permanent markers
- Gloves



Experiment Procedure

Part 1: Setup & Hypothesis (Week 1 - 30 minutes)

1. **Engage:** Show students a pumpkin. Ask: "What happens to pumpkins after Halloween? How do they change over time?"
2. **Introduce Variables:** Explain they'll test different conditions:
 - Container 1: Dry soil (control)
 - Container 2: Moist soil
 - Container 3: Moist soil in sunlight
 - Container 4: Moist soil in refrigerator
3. **Prepare Containers:** Students work in groups to:
 - Label containers
 - Add equal amounts of soil
 - Place pumpkin pieces in each
 - Apply different conditions
4. **Make Predictions:** Students complete initial observations and hypotheses.

Part 2: Weekly Observations (Weeks 2-4 - 10-15 minutes each)

1. **Consistent Data Collection:** Each week, students:
 - Observe changes in each pumpkin
 - Measure mold growth (if any)
 - Record texture changes
 - Note any smells
 - Draw detailed observations
2. **Safety:** Remind students not to open containers or touch decomposing material directly.

Part 3: Final Analysis & Conclusions (Week 4 - 20 minutes)

1. **Compare Results:** Groups share their findings across all conditions.
2. **Discuss Patterns:** "Which condition decomposed fastest? Why?"
3. **Real-World Connections:** Connect to composting, recycling nutrients, and natural cycles.

Pumpkin Decomposition Recording Log

Part 1: Experimental Setup

Our Variables:

- Independent Variable (what we change): Environmental conditions
- Dependent Variable (what we measure): Decomposition rate
- Controlled Variables (what stays same): Pumpkin size, soil type, container size

Container Conditions:

Container #1: _____

Container #2: _____

Container #3: _____

Container #4: _____

Hypothesis:

I predict that the pumpkin in _____ will decompose the fastest because...

Part 2: Weekly Observations

Week 1 - Initial Observations:

Container	Color	Texture	Smell	Mold?
#1				
#2				
#3				
#4				

Week 2 Observations:

Container	Changes Noticed	Mold Coverage	Smell
#1			
#2			
#3			
#4			

Week 3 Observations:

Container	Changes Noticed	New Organisms	Decomposition Stage
#1			
#2			
#3			
#4			

Week 4 Observations:

Container	Final Appearance	Decomposition Rating (1-5)	Surprising Findings
#1			
#2			
#3			
#4			

Which condition decomposed fastest? _____

Which condition decomposed slowest? _____

Evidence to support your conclusions:
