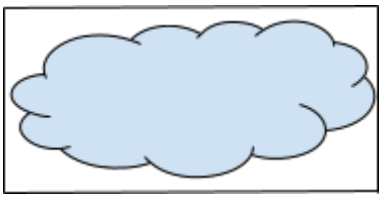
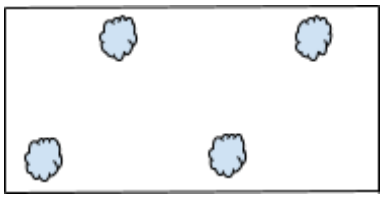
Teacher Notes

Preparation Before the Lesson:

1. **Materials Preparation**:
    - Ensure that all materials listed for the experiment are available and organized:
        - Three containers with pre-labeled soil samples (whole spray, variable spray, and control) that have been treated with Miracle-Gro or similar fertilizer



Whole Spray (30 sprays)



Variable Spray (4 sprays)



Control (No spray)

        - Soil testing kits (pH, nitrogen, phosphorus, and potassium)
        - Water testing kits (pH strips, secchi disk, nitrate, and phosphate testing materials)
        - Large straws for core sampling
        - Distilled water (enough for each group to use 500 mL per soil container)
        - Specimen cups for collecting runoff water
    - Ensure that the Google Slide presentation template for the digital gallery walk is set up and shared with all students.
2. **Pre-lab Setup**:
    - Prepare a demonstration or introductory presentation to explain the concepts of whole field vs. variable spray fertilizer application and their potential impacts on soil and water quality.
3. **Safety Precautions**:
    - Review the safety precautions with students and ensure that they understand the importance of following these guidelines during the experiment.
    - Have safety equipment (gloves, goggles) readily available and ensure students know where to find them.

During the Lesson:

1. **Engage**:
    - Introduce the experiment by discussing the environmental impacts of different agricultural practices.
    - Explain the purpose of the experiment and how it fits into the broader context of sustainable agriculture.
2. **Explore**:
    - Distribute the materials to each group and review the procedures.
    - Monitor the students as they conduct the experiment, providing guidance and ensuring they follow the correct procedures.
    - Encourage students to ask questions and discuss their observations as they work.

Teacher Notes

3. **Explain**:
    - Guide students through the creation of their digital gallery walk slides.
    - Ensure each group includes a summary of the experiment and their results for the control, whole spray, and variable spray conditions.
    - Facilitate the peer review process, encouraging constructive feedback and discussion.
4. **Elaborate**:
    - Organize the field collection activity, assigning specific areas for soil and water sample collection.
    - Supervise the students as they collect and test their samples, ensuring safety and accuracy.
    - Assist students in comparing their new data with the initial experiment results and analyzing any differences.
5. **Evaluate**:
    - Provide detailed guidelines for the formal lab write-up and explain the assessment criteria.
    - Monitor the peer review process and provide additional feedback as needed.
    - Grade the final lab reports, providing comprehensive feedback on each section of the report.

Reflection and Follow-Up:

1. **Reflective Discussion**:
    - Conduct a class discussion to reflect on the overall experiment and the lab write-up process.
    - Encourage students to share what they learned, challenges they faced, and how they overcame them.
2. **Feedback and Improvement**:
    - Review the students' reflections and provide additional feedback or suggestions for improvement.
    - Consider any adjustments or improvements to the experiment for future classes based on student feedback and observations.
3. **Connection to Broader Concepts**:
    - Relate the experiment results to real-world agricultural practices and environmental sustainability.
    - Discuss potential next steps or further experiments that could build on the findings of this lab.