Activity 26

MOISTURE AND SEED GERMINATION

STUDY QUESTION: How can too much and too little moisture affect seed germination?

THE ACTIVITY: Students design and perform an experiment to test the effects of too much and too little moisture on seed germination.

CURRICULUM FIT:

GRADE EIGHT - SCIENCE
- Growing Plants

DIVISION THREE - AGRICULTURE: LAND AND LIFE
- Optional unit on Weather and Crop Management

AGRICULTURE CONCEPTS: Importance of soil and water

PURPOSE:
- To form a hypothesis and to design a scientific experiment.
- To observe and compare the effects of too much and too little moisture on seed germination.
- To record observations and organize data into a table.

MATERIALS REQUIRED:
Newspaper for working on.
Glass or clear plastic containers for pots.
Potting soil.
Graduated cylinder or other device for measuring water.
Seeds (barley or wheat).
Water.

TIME REQUIRED: One period to prepare, five minutes of each following day for about a week to make observations, and one period to analyze and discuss results.

BACKGROUND - For the Teacher

Water is a basic requirement of crop production. Without water, seeds could not germinate and seedlings could not develop to their full potential. However, too much water can also be detrimental to crop production. Using experimentation as a problem-solving technique, students will determine the effects of too much and too little moisture on seed germination. This information can then be applied to crop production.

PROCEDURE

Part 1
Preparation

1. Gather materials.
2. Photocopy lab report form (see Student Task Sheet) or write the format on the board for students to follow on their own paper.

Part 2
Introduction

3. Present students with the problem of designing an experiment that will answer the question, "How can too much and too little moisture affect seed germination?" Stress that only the amount of moisture should vary between samples. All other variables should be constant.

Part 3
Activity

4. With a partner, the students outline their hypothesis, procedures and materials in their lab report. Emphasize the need for details so that another person could perform their experiment by reading their lab report.
5. The teacher can circulate during this time to give directions and assistance where necessary. All procedures should be approved by the teacher before the students gather their materials and begin to perform their experiments.
6. Students gather their materials and set up their experiments.
7. For five minutes of each class for the next week students will record the information from their observations in a table for their lab report.

Part 4
Conclusion

8. Students will write a conclusion for their lab report in which they summarize their observations and compare the effects of too much water to the effects of too little water on seed germination.

DISCUSSION QUESTIONS

1. What were the effects of too little moisture on seed germination?
2. What were the effects of too much moisture on seed germination?
3. How did the effects of too little moisture and too much moisture differ? How were they similar?
4. How might too much moisture affect crop yield?
5. How might a farmer increase his crop yield in areas where there is too much/too little moisture?
6. Would the results of your experiment apply to all types of agricultural crops? Why or why not?
7. How could a farmer use this information when planting his crops?

RELATED ACTIVITIES

1. The effects of too much and too little water on plant development - continue with the students' seedlings from this experiment.
2. The effects of too much and too little water on plant development - experiment with healthy seedlings and/or mature plants.
3. Research precipitation in your area and crop management practices used to maximize production with regard to the amount of moisture available.
4. Do a case study of the effects of too much or too little moisture on crop production.
5. Do a comparison study of vegetation in areas with too much water and areas with too little water.
6. Invent a technology for increasing crop yield in areas where there is too much or too little water.

By Mary Greenfield

STUDENT RESOURCE

SHEET ONE --

Weather and Crop management

Problem:

How can too much and too little moisture affect seed germination?

Hypothesis:

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Materials:

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Procedure:

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Observations:

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Conclusion:

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