

Where Would We Be Without Seeds?

Grade Level: 3

Approximate Length of Activity: 45 Minutes

Objectives

Teacher

1. Explain the importance of seeds.
2. Explain how farmers contribute to the growth of seeds.
3. Assist students in demonstrating soil tests.

Students

1. Learn the parts of seeds and the plant life cycle.
2. Understand the role farmers play in growing seeds.
3. Perform tests to show how nutrients are found.

Michigan Content Standards: (Science) S.IP.03.12; S.IA.03.13; L.OL.03.41; L.OL.E.4; E.SE.E.1

Introduction

Farmers play a major role in the growth of seeds. Farmers have to know a lot about seeds and lots of other things to do a good job farming.

We will discuss the things that are needed to make seeds grow and touch base on the ways farmers test to insure there are enough nutrients in the soil in order for the seeds to grow. In fact, even though you've probably never seen a farmer in a lab coat, a farmer is really an agri-scientist. He or she needs to know how to calculate information about crops and livestock on a computer or calculator, how to test soils and plants, and how to keep machinery running smoothly.

So next time you see a farmer in the field, barn, greenhouse or orchard, remember: It's because of them that we don't have to worry about where we would be without seeds!

Materials Needed

- Bag of assorted seeds (containing 5 or more different kinds per bag: seed corn, wheat, soybeans, maple seeds, dry beans, cherry pits, apricot pits, sugar beet seeds, cotton seeds (or any that you have available, pick a variety of seeds of different size, texture, color)
- Seed observation handouts (1 per group of 4 students)
- 1 large poster with seed parts
- Seed part handouts (one per student)
- Seed growth sequencing handouts (one per student)

- 1 bag of product samples and matching seeds (bread-wheat, cereals-corn, milk carton-grass, juice-apple seed, fruits, vegetables-lima bean, and eggs-chickens eat corn)
- 1 soil sample bag
- 2 plastic milk jugs for water
- fill one with plain tap water
- one with tap water and $\frac{1}{4}$ cup of lemon juice(label)
- Potting soil
- Lab sheets (one per group)
- Plastic 5-6 oz. cups for pH test (2 cups per group)
- Plastic or Styrofoam 5-6 oz. cups to plant seeds (1 per student)
- Plastic cups
- Bean seeds (to plant)
- Corn seeds (to plant)
- Pieces of pH test paper
- 1 jar of lemon juice or dish soap
- 2 lab coats filled with various items (calculator, thermometer, soil test sheet, and syringe)
- Paper towels
- Magic marker or pen
- Soybean seedlings (optional)
- Mature soybean plants (sprayed with lacquer)
- Newspaper to cover tables
- pH worksheet (1 per group of 4 students)

Activity Outline

1. Observe seeds and note any differences.
2. Learn the parts of seeds.
3. Learn the cycles of plants.
4. Discover uses of seeds and plants.
5. Discover the needs of plants.
6. Learn how farmers test to insure their soil has enough nutrients.
7. Plant our own soybeans and corn seeds.

1. Observe seeds

Divide students into groups. Distribute 5-6 different seeds to each group and 1 "Observation Sheet" per group.

Explain: Today we are going to look at several kinds of seeds. We will learn how they are alike and different, how they grow, what they need to grow and why they are very important to all of us.

- Have students look at seeds, note any differences using their senses (sight, smell, touch, etc.) and write discoveries on handouts.
- Have a group share one way that the seeds are different from each other. (List on board size, shape, color, texture, etc.)
- Have a group share one way that the seeds are alike. (List on board – all seeds grow into plants, all need water, soil and sun, all came from plants, etc.)



Explain: Those are all ways that the seeds you looked at are alike. Another way that they are alike is the parts they each have on the inside.

2. Parts of Seeds

Show the “Name the Parts of a Seed” poster. Pass out 1 handout per student. Have them write each part in the correct place.

Explain: Every seed has the same three parts in it. The embryo (which will grow into the new plant) the food supply (that will help the embryo grow), and the seed coat (which protects the embryo and the food supply). (The correct order is embryo, seed coat, food supply).

3. Plant Cycle

Distribute sequencing handout, show plants at various stages.

Explain: Even though all seeds have the same parts, they do not all grow into the same plant. Each seed you looked at will become a different plant. But, every seed goes through certain stages when it grows and we call these stages the plant cycle. Let’s take this bean seed for example. If we planted that seed and gave it the water and nutrients it needs, pretty soon it would come up out of the ground as a soybean seedling (or small plant). Then with sunlight and nutrients the seedling would become a mature plant. Once the plant was mature (all grown up) it would produce more seeds, which starts the cycle all over again (like this mature soybean plant). On your paper, put the plant cycle in the correct order by numbering 1 through 4 (The correct order is 3-4-1-2).

4. Uses of Seeds/ Plants

Show product samples – pull products from bag, one at a time and show seed samples.

Explain: Now that we know how seeds are alike and different and how they grow, let’s talk about why they are important. Ask: How many of you had breakfast today? Well, let’s see if any of you had what’s in my box today (pull out bread/toast, bagels, Cheerios, Frosted Flakes, Rice Chex, Rice Krispies, piece of fruit, milk carton).

Explain: As you can see, each of these products was made from a seed. But, let’s not forget that seeds grow into plants too. So if you had fruit or juice for breakfast, you ate something from seeds too. Ask: How about milk? Does it have anything to do with seeds? Well, milk comes from _____. Right! Do you think you need seeds to get milk? Explain: Cows eat grain, grass and hay, which all come from seeds. So, I guess there’s no getting away from seeds, is there?

5. Needs of Plants

Show soil sample bags, seed, soil, water, pots, pH test paper, and data sheet.

Explain: Of course, it takes lots and lots of seeds to make all the food that we eat as well as food for all the livestock to eat. So farmers have to be pretty smart about helping each seed grow its very best. To do that, a farmer has to know what each seed needs to grow. Ask: What do you think each seed would need to grow? (List water, nutrients, soil, sunlight, etc. on board). Explain: Farmers need even more than that. They need to know if their soil has enough nutrients in it to help the seed grow. To find that out they collect soil samples from their fields and have them tested in a lab. Sometimes a farmer will do his or her own test. Let’s try a test that a farmer might do.

Pass out 2 glasses per group. Fill cups with the 2 different gallons of water (1 plain and 1 with lemon juice). Pass out 2 pH strips per group. Help students and explain pH worksheet.

Explain: This is a test for pH (write on board), which means how acidic the soil or water is. Most seeds like soil and water have very little acid in it. You are going to test 2 different cups of water to see which one would be the best to help seeds grow. This paper will turn a color if there is acid in the water and it will stay the same if there is not. Farmers need to check a pH chart. (Check- green would be ok). (Have each student dip their paper strips in each glass to see what happens).

Explain: If a farmer found that his soil or water had more acid than it should, he or she would have to add limestone or other material to the soil to fix the problem. Then farmers use fertilizers to provide the nutrition that seeds need to have.

Put student name on cup. Fill cup $\frac{1}{2}$ full with soil. Pass out seeds to plant and water planted seeds.

Explain: Now each of you will plant your own seeds in a cup with soil and water. We are going to plant soybeans and corn seeds. The soybeans will grow into seedlings like this and then into a mature plant in about 120 days, if they get water and sunlight. The corn will take longer, about 180 days.

Pull calculator, thermometer, and soil test sheet out of lab coat.

Explain: We have talked a lot today about seeds and how important they are. I hope you have also learned that farmers have to know a lot about seeds and lots of other things to do a good job farming. In fact, even though you've probably never seen a farmer in a lab coat like this (put on coat); a farmer is really an agri-scientist. He or she needs to know how to calculate information about crops and livestock on a computer or calculator, how to test soils and plants and how to keep machinery running smoothly. So, the next time you see a farmer in the field, barn, greenhouse or the orchard, remember: It's because of them that we don't have to worry where we would be without seeds!

Discussion Questions

1. What are the parts of a seed?
2. How is a plant started?
3. How does a plant grow?
4. Why are seeds important?

Related Activities

1. Have students measure growth of their planted seeds in different environmental conditions.
2. Have students test soil pH with different types of potting soil and grow plants in the various types measuring any differences.
3. The lesson "Next Year's Seeds" located in the math section of this curriculum guide.
4. The lesson "How Does My Garden Grow?" located in the language arts section of this curriculum guide.

Book Resources

1. "From Seed to Plant" by Gail Gibbons
2. "Beyond the Bean Seed" by Nancy Allen Jurenka

Observation Sheet

Use your eyes, nose and fingers to find out the color, shape, size and texture of the different seeds in your bag.

Write your observations on this sheet as a group.

Seed	Color	Size/Shape	Texture (feel)
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1. _____

2. _____

3. _____

4. _____

5. _____

6. _____

7. _____

8. _____

pH Worksheet

1 per 4 students
Work in your groups

Procedure

1. Obtain two (2) glasses of water (H₂O)
2. Label glasses with a 1 and 2
3. Obtain pH test paper
4. Dip the pH paper in H₂O
5. Observe the color change

What color does the test paper turn?

Glass #1 _____

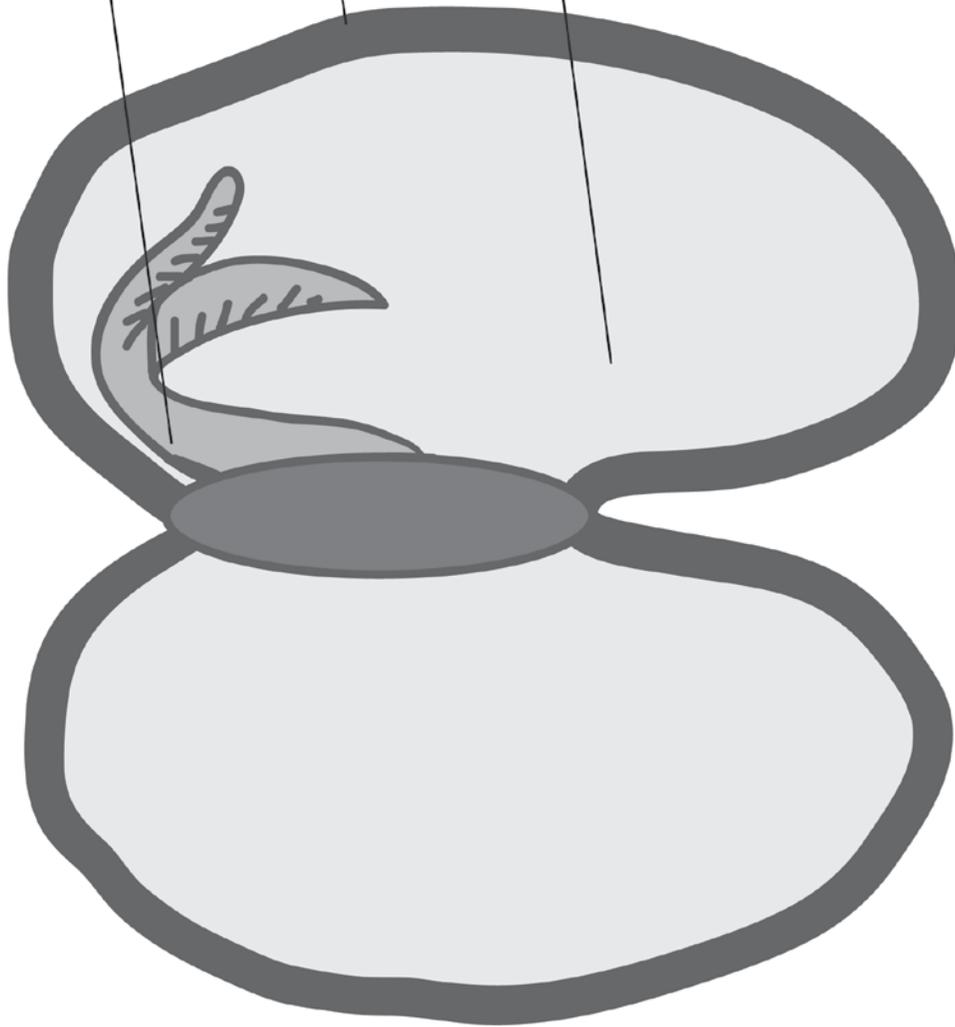
Glass #2 _____

Conclusion

Write a sentence explaining what happened in your experiment.

NAME THE PARTS OF A SEED

Name: _____



Write these parts of a seed on the
correct lines above:

- Embryo
- Seed Coat
- Food Supply

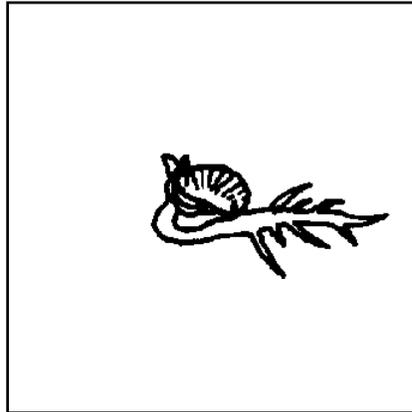


HOW DO SEEDS GROW?

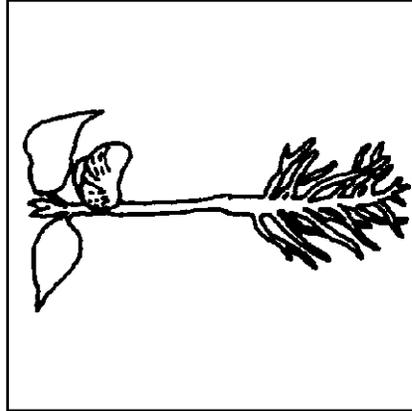
Name: _____

Number 1 through 4 how seeds grow into plants

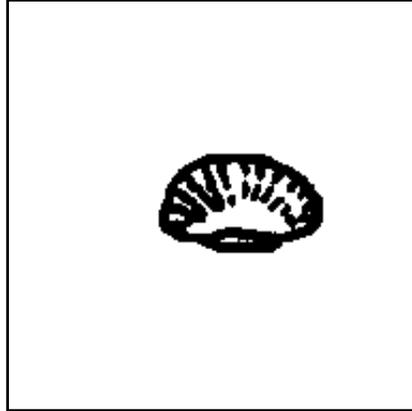
Seedling



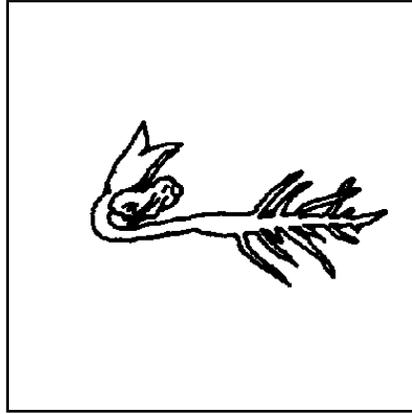
Mature Plant



Seed



Sprouting Seed



The correct order is: _____