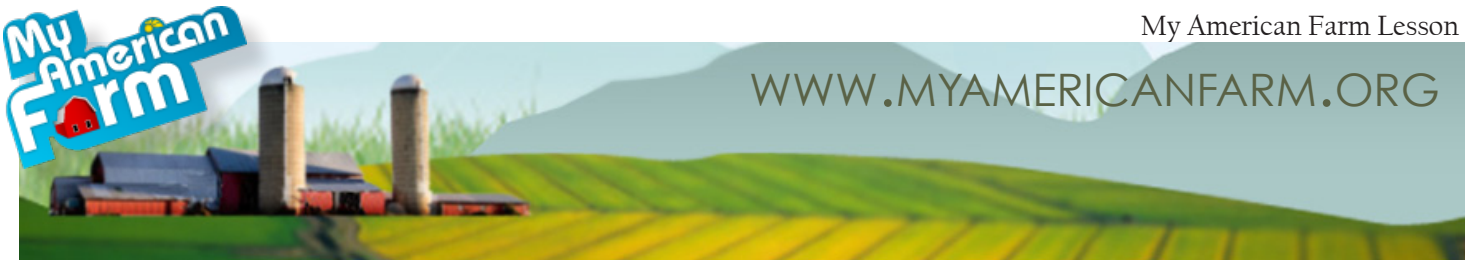


The Science of Seeds

Lesson Snapshot

Related "My American Farm" Game

The Great Seed Search
Available at www.myamericanfarm.org

Grade Levels

- Third - Fifth

Content Area

- Science

Standards

3-LS-1 Develop models to describe that organisms have unique and diverse life cycles, but all have in common birth, growth, reproduction and death.

4-LS-1 Construct an argument that plants and animals have internal and external structures that function to support survival, growth, behavior, and reproduction.

Next Generation Science Standards

What Will You Do?

In this activity you will conduct a science experiment using three varieties of seed.

Supplies You'll Need

- 3 varieties of seed - 8 seeds per variety (1 set per student/pair)
- Potting soil (1 large bag)
- Dozen egg carton, empty (1 per student/pair)
- Marker (1 per student/pair)
- Spray bottle or watering can with water
- Worksheet and pencil (1 per student/pair)
- (Optional) Computers and internet access – 1 per student or pair *This is only necessary if you wish to do the ?.y American Farm game in class.
- (Optional) Headphones - 1 per student *This is only necessary if you wish to do the game individually in class.

Preparation

- Select three seed varieties which will sprout in less than six weeks.
- Visit My American Farm online (www.myamericanfarm.org) to preview "The Great Seed Search" game.
- Review the lesson. There are a couple of places where you will see an asterisk (*). These are areas where you can choose to modify the lesson. To determine if you need to make these modifications, ask:
  - » How much time would you like to allocate for the activity?
  - » How would you like students to demonstrate what they've learned?

Introduction

Set Context for the Activity

Step 1: Introduce the term "Agriculture"

- Set Context: *How many of you like to eat? Did you know that we depend on American farmers and ranchers for the food we eat, the clothes we wear and even the wood that is used to build our homes? Producing the things we need to survive and thrive is part of the industry we call "agriculture". Today we all get to be agricultural researchers, as we conduct our own plant experiment!*

Body

Main Content

Step 2: Create a Hypothesis

- Divide students into pairs or allow to work independently.
- Show students three varieties of seed. (i.e. corn, bean, flower).
- Ask students to copy the following question in their worksheet: Which

seed will sprout the fastest? (List seed varieties)

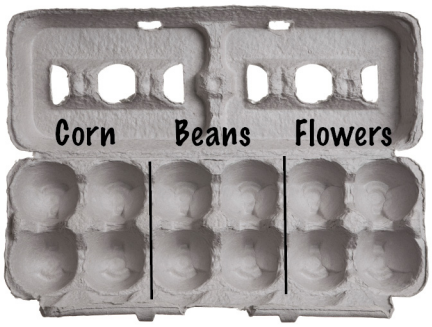
- Ask students to write down their hypothesis (educated guess) starting with, "If seeds are planted at the same time, _____ will sprout first."

- Inform students that this is called a hypothesis. Asking a question and forming a hypothesis are the first two steps in the scientific method that all researchers use.

Step 2: Time to Plant!

- Give each student or pair an empty egg carton. Have students write their names on the carton with a marker.

- Using a marker, have students label three equal sections in the egg carton by drawing a line and listing one variety of seed. See example below.



- Have students fill their carton with soil, but fill only high enough so that the separate egg holes are still visible.

- Demonstrate how to plant seeds. Students should stick one pinkie finger into the soil, until the soil is half way up their fingernail. Students are to drop two seeds in each hole. Remind students to keep varieties in the right sections!

- Inform students, that before planting, they are to carefully look at their seeds and draw a picture of each seed variety on their worksheet.

- Distribute seeds, one variety at a time. After all seeds have been drawn and placed, students can gently cover with soil.

*Digging Deeper: Ask students to consider what farmers have to think about when they plant each year. Listen for concepts such as temperature, weather, seed variety, soil, cost of seed, etc. Let students know that there are scientists called agronomists who work hard to research seeds so that farmers plant the right seed each time!

Step 3: Water

- Using a spray bottle or watering can, have students water their egg carton-seed beds until the soil is moist.

- Remind students they will need to do this repeatedly over the course of the study.

- Place seed beds in direct sunlight.

Step 4: Play Game

- At this point you may elect to have students play "The Great Seed Search", available at myamericanfarm.org. Students can work individually or in pairs.

- Inform students that they will be jumping into a fun game, in which they will learn more about agriculture by collecting seeds from around the world!

*You may choose to have students play this game before you arrive, after you have left, or at home with adult permission.

*The game is supported by audio. You may wish to secure headphones for students, or play the game as a class while displaying on a large screen.

Wrap Up

Review, Assess, Challenge

Step 5: Observation

- Ask students to recall the first two steps of the scientific method. (Ask a Question, Form a Hypothesis) Inform students that the next steps in the scientific method are to conduct an experiment and record data.

- Students will conduct this experiment for six weeks. Once a week, students are to record observations on their worksheet.

- At the conclusion of the experiment, students can determine if they wish to accept or reject their hypothesis by reviewing the data they have collected.
- Challenge students to look for similarities and differences in the way each variety of plant grows.
- At the conclusion of the study, ask students to consider what characteristics of each plant would likely help it in its natural environment. (i.e. The sturdy stalk of a corn plant helps it grow tall and hold heavy ears of corn. The bright colors of flowers attract bees for pollination.)
- Remind students that seed research is an important part of agriculture.

* If you are a classroom teacher, you may wish to extend the length of this study or have students keep a more comprehensive notebook of observations.

* If you are a volunteer educator, you may wish to come back to the class at the end of the study to ask students what they learned!

*This lesson provides a great opportunity to reinforce how farmers care for the land. Ask students at the end of study what they did to help their plants grow. Compare this to how farmers work hard to care for the land so that they can grow plants year after year.

Teaching Notes

Foundation Contact Information

American Farm Bureau Foundation for Agriculture

600 Maryland Ave SW

Suite 1000w

Washington D.C 20024

Phone: 1.800.443.8456

Fax: 202.406.3756

Name(s): _____

The Science of Seeds

1. Question:

2. Hypothesis:

3. Conduct an Experiment and Observe!

For each date, draw a picture of what you see and write notes about each group of seeds. You may want to use a ruler to measure plants as they grow.

Seed Names → / Date ↓			

SEED NAMES → / DATE ↓			

4. DO YOU ACCEPT (AGREE WITH) YOUR HYPOTHESIS? DO YOU REJECT (DISAGREE WITH) YOUR HYPOTHESIS?: