Maryland 4-H Youth Development
To Make The Best Better

UNIVERSITY OF MARYLAND EXTENSION
Solutions in your community

Seed Soil Sun

4-H

Supplemental Lessons

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Maryland Agricultural Education Foundation
Ag Literacy Program 2010 Lesson Plan

Seed, Soil, Sun: Earth's Recipe for Food
Cris Peterson
Boyd's Mill Press 2010

Summary: Seed, soil and sun are three of the key ingredients for growing food. This book describes the process by which air and water combine with seed, soil and sun to create nearly all the food we eat. Using the corn plant as an example, the story line follows the germination of the seed into a giant plant that reaches high in the air and has roots that extend nearly six feet in to the ground. Beautiful color photographs enhance the story.

Main ideas to share with students:
1. Soil, sunshine, rain, air and seeds are needed to produce our food.
2. Most food comes from seeds planted in the soil.
3. Crops provide food for people and food for animals that provide us with meat, milk and eggs.
4. More corn is planted in the U.S. than any other seed.
5. Soil provides nutrients for plants.
6. Earthworms enrich the soil by providing tunnels (to allow air and water to help plants breathe and grow) and castings (natural fertilizer).
7. Plant leaves combine sunlight, carbon dioxide and water to create sugar that allows the plant to grow and produce oxygen (photosynthesis).
8. Plants store extra energy in their parts (leaves, roots, stems, flowers, seeds) which provide our food. Plants also provide food for animals which produce food (milk, meat, eggs) for us to eat.
9. Harvested plants provide seeds for the growing process to begin again.

Some Useful Props to Share with Students in the Classroom
1. Different kinds of seeds (corn, soybeans, wheat, melons, sunflowers – a variety of shapes and colors OR buy a bag of 15 bean soup mix). Students can sort the seeds and create a bar graph with the data they collect OR they could list the properties of each seed (color, shape, texture).
2. Some fruits or vegetables that represent different parts of a plant (celery, broccoli - stem; carrot, beet, turnip or radish - root; apple, peach, pumpkin - fruit; lettuce, spinach - leaves; cauliflower or broccoli - flower).
3. Some fruits that can be cut open to show the variety and number of seeds contained in the fruit/vegetable - tomato, pepper, peas, lima bean, cantaloupe.
4. Share three different kinds of corn seed (field, sweet, popcorn) and their uses and products that they can be used to produce.
5. Share an entire corn plant. Talk about all of its different parts and/or use the cut off corn plant showing its roots and how it is left in the field to prevent erosion.
6. Share a sunflower with all of its seeds and have students estimate how many seeds there are in one flower head.
7. Share some samples of rich soil and hard clay soil and discuss why one kind is better than another for growing seeds.
8. Bring in some earthworms and discuss ways they are beneficial.

**Introduce the Book**

Show the cover and title of the book, *Seed, Soil, Sun*. Highlight the upper right hand corner of the cover which says, *Earth's Recipe for Food.*

Ask: What is a recipe? (elicit *ingredients* and *procedure* used to produce something like a cake, salad or even ice cream. *Certain ingredients are combined in a special way to create a final product.*)

What ingredients does the earth need to provide to produce our food? Accept suggestions and write on board: *seeds, soil, water and sunlight.*

Point to the sunflower and ask, *“Do you know what kind of flower this is?”* Do you know what is in the center of the flower inside the rows of petals? There are lots of seeds in the center of each sunflower. If available show a sunflower and its seeds.

Read the book and show the pictures with the students sitting around you. Share any of the props you brought that coincide with the book either as you read or as a review at the end.

Conclude the reading by introducing the word **AGRICULTURE**.

Ask, *“What do you think this word means?”* Accept answers and guide toward the following definition. Tell them you have a special recipe that helps you remember what it means.

Write on the board

**Agriculture**

\[
\text{agri} \text{ (means land)} \quad \text{culture} \quad \text{means to grow} 
\]

SO... \[
\text{agri} + \text{culture} = \text{growing plants or raising livestock (farm animals) on the land?}
\]

What plants might a farmer grow? Accept suggestions. What are some animals that are raised on a farm? Accept suggestions.

| Agri means land | Culture means to grow (like a doctor takes your throat culture to see if there are any germs growing). |
Follow-up Activities:

1. Give each student a bookmark and review the important part each picture/word has in producing our food.
2. Ask students to tell you what the word agriculture means.
3. Highlight the special characteristics of the sunflower found on the book cover. Share some of the facts found below.
4. With the teacher’s permission share popcorn, sunflower or pumpkin seeds with the students.

Earth’s Recipe for Food

- Seed
- Sun
- Soil
- Water
- Earthworms
- Leaves
- Farmer or Gardener provides
- O₂
- Food
- O₂

Sunflower Facts

1. Sunflowers grow quickly from a seed.
2. Sunflowers turn to follow the sun until they bloom.
4. Some sunflowers grow very tall.
5. By fall, sunflowers have dried and are ready to be harvested.
6. There are two kinds of sunflowers — striped and black. Striped sunflowers are roasted, eaten and used in other foods. Birds love them, too!
7. Black sunflowers give us yellow oil. This oil is used in cooking and in soap and paints. The part of the seed that is left over after being pressed for oil is fed to farm animals.

Sunflower Trivia

- The tallest sunflower plant on record was grown in the Netherlands.
- It was 25 feet, 5 ½ inches tall.
- The largest sunflower head on record was grown in Canada. It measured 32 ½ inches in diameter.
Seed Soil Sun

Vocab

Seed: what develops into a plant.

Harvest: pick the grain from the plant.

Root: part that grows down into the soil carries water and nutrients to the plant.

Shoot: part of the seed that grows up towards the sun.

Germinate: when the seed sprouts.

Soil: tiny layer of the earth that is made up of silt, sand, clay and organisms.

Bacteria: use energy stored in the leaves, roots, twigs and insects to recycle nutrients that feed the plant.

Castings: a rich natural fertilizer that earthworms produce for the plant.

Oxygen: released into the air from plants so that people are able to breath.

Photosynthesis: the way plants turn sunlight, water and carbon dioxide into sugar.

Water: Plants and animals need fresh _____ daily.

Sunlight: required for photosynthesis.

Field Corn: used to feed our animals.

Popcorn: put into a microwave and eaten for a snack.

Earthworms: live in the soil and produce castings.

Plants: only living things that use sunlight’s energy to grow.

Stem: the main support of the plant.

Leaves: absorb sunlight for photosynthesis.

Lettuce: a food that you are eating the off the plant.

Celery: a food that you are eating the stem of the plant.

Broccoli: a food that you are eating the flower buds.

Apples: a food that you are eating the fruit of the plant.

Carrots: a food that you are eating the roots of the plant.

Corn: a food that you are eating the seeds of the plant.
Basic Parts of a Plant

- bud
- flower
- leaf
- root
- stem
Seed Soil Sun

SEED
HARVEST
ROOT
SHOOT
GERMINATE
SOIL
BACTERIA
CASTINGS
OXYGEN
PHOTOSYNTHESIS
WATER
FIELD CORN
POPCORN
EARTH WORMS
PLANTS
STEM
LEAVES
LETTUCE
CELERY
BROCCOLI
APPLES
CORN
Word Bank:

Seed
Harvest
Root
Shoot
Germinate
Soil
Bacteria
Castings
Oxygen
Photosynthesis
Water
Sunlight
Field Corn
Earthworms
Leaves
Lettuce
Celery
Broccoli
Apples
Carrots
Corn
Stem
Plants
Popcorn

Across
1. tiny layer of the earth that is made up of silt, sand, clay and organisms.
2. releases into the air from plants so that people can breath.
5. a food that you are eating the leaves off the plant.
6. use energy stored in leaves, roots, twigs and insects to recycle nutrients that feed the plant.
7. a food you are eating the seeds.
8. the way plants turn sunlight, water and carbon dioxide into sugar.
9. plants and animals need ______ daily.
10. a rich natural fertilizer that earthworms produce for the plant.
11. a food that you are eating the flower buds.
12. only living things that use sunlight's energy to grow.
13. part that grows up towards the sun.
14. what develops in a plant
15. the main support of the plant.

Down
2. when the seed sprouts
4. absorb the sunlight for photosynthesis.
6. live in the soil and produce castings
9. a food that you are eating the roots
10. used to feed our farm animals.
11. required for photosynthesis.
14. put into microwave and eaten for snack.
15. a food that you are eating the stem off the plant.
16. pick the grain from a plant
18. a food that you are eating the fruit
20. part of the seed that grows up towards the sun.