

Our Basic Needs

Summary: Students identify the basic things that people, plants, and animals need in order to live and grow, as well as how we depend on agriculture for some of these needs.

Objectives:

The students will:

- Identify that both people/animals and plants need air, water, food, light, shelter, and space in order to survive.
- Compare and contrast the needs of plants to those of people/animals.
- Describe how people depend on agriculture for food, clothing, shelter, and other products.

Materials:

Activity #1:

- Venn Diagram materials (chalkboard, posterboard, or photocopy of diagram from Appendix, markers)

Activity #2:

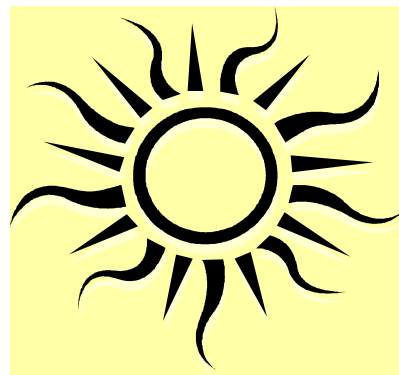
- 50 bean seeds, any type—string, wax, or pole beans are good varieties to use (germinated into at least 35 seedlings)
- one large clear glass jar
- paper towels
- 21 planting containers (peat pots, egg carton sections, empty yogurt cups, Dixie cups, etc.) (punch holes in bottom for drainage)
- seed starter soil or potting soil
- labels (or masking tape) and a permanent marker
- window space/light source
- 6 trays or plastic plates (to sit under plants)
- water
- several rulers, measuring tapes, strips of paper
- paper and pencils for recording results

Activity #3:

- found objects around the classroom that are products of agriculture
- photocopied pictures from last page of lesson to label items

Getting Started:

- For Activity #2, plant seeds in containers about three weeks before you will start the experiments. Put some seeds in a jar of water so that students can see what is happening underneath the soil (seed germination).
- Buy and gather supplies needed to carry out plant experiments.



Grade Level: K-6

Topic: Basic needs, Agriculture

PA Environment & Ecology Standards Addressed:

Agriculture and Society:

4.4.4.A: Know the importance of agriculture to humans.

- Identify people's basic needs.
- Know how people depend on agriculture.

4.4.4.C: Know that food and fiber originate from plants and animals.

- Identify what plants and animals need to grow.

Teaching Methods:

- Lecture/Discussion
- Demonstration
- Experiments/Observations

Multiple Intelligences Utilized:

- Naturalistic
- Interpersonal
- Intrapersonal
- Logical/Mathematical
- Bodily/Kinesthetic

Background:

People, other animals, and plants are living systems that need many of the same basic things in order to survive: air, food, water, light, shelter, and space.

Plants take up water and minerals through their roots and take in air through tiny openings in their leaves called stomata. Most plants need light or sunshine to make food (photosynthesis).

People and other animals take water, air, and food in through their mouths and noses since they do not have roots. People also need sunshine because when our skin is exposed to sunlight, vitamin D is produced. This valuable vitamin helps to protect the body from diseases. The sun also warms the earth, its people, and all living things.

Water makes up 65 to 70 percent of the human body. It aids in digestion, carries nutrients throughout the body, helps control body temperature, eases movement, reduces friction between internal organs, and transports waste out of the body.

People, animals, and plants need shelter and space in which to live. Shelter protects us from the elements and keeps us safe from predators. And we all need our own space to continue to grow and develop. If plants are planted too closely together and do not have enough space, they will have to compete for food, light and water. Eventually, the weaker plants will die off.

Agriculture is such a huge part of our lives. Products that we use every day come from plants and animals that are produced and raised by farmers and ranchers in the Americas. Products under the following categories are made possible due to agriculture:

*Health care: pharmaceuticals, surgical sutures, ointments, latex gloves, x-ray film, gelatin for capsules, heart valves

*Construction: lumber, paints, brushes, tar paper, dry wall, tool handles

*Transportation: fuel, lubricants, antifreeze, tires, upholstery

*Manufacturing: adhesives, solvents, detergents

*Printing: paper, ink, film

*Personal care: shampoo, cosmetics, lotions, fingernail polish, toothpaste

*Education: crayons, textbooks, chalk, desks, pencils, paper

*Sports: uniforms, baseball bats, leather equipment and shoes

Activity #1:

People vs. Plants Venn Diagram

This activity helps to illustrate that even though people and plants have many differences, they have many similar needs too! Use the Venn Diagram as an illustration and discussion starter to compare and contrast the needs of people and plants.

Be sure to explain that people are animals (many students may not know this or not think of people as animals). This activity can be used before or after presenting the background information.

- Create a Venn Diagram (two intersecting circles) by drawing them on the chalkboard, on a poster board, using two hula hoops (and labels for answers), or modifying the example in the Appendix of this guide.
- Label the left side of the circle "Peoples' Needs."
- Label the right side of the circle "Plants' Needs."
- Label the center section where the circles overlap "Both."
- Ask the students to offer ideas as to what should go in each section. Discuss their answers. How similar are plants and people? How different?

Activity #2:

What Do Plants Need?

By depriving real plants of basic needs, students will identify what plants need in order to grow. The experiments will also reinforce the scientific method process in its simplest form (discussing a theory, forming a hypothesis, testing the hypothesis, drawing conclusions).

- **Getting Started**: Approximately three weeks before starting the experiments plant bean seeds in containers and place near a window. Follow any specific directions on seed packet. Check soil every day and keep moist but do not over water. Seedlings will be ready when they have developed leaves and roots. You may want to put some seeds in a jar of water at the same time so that the students can see the germination process since they cannot see what is happening underneath the soil.
- **Doing The Activity**: Ask students what plants need to grow (*air, food, water, light, shelter, and space*). This reinforces the **theory**.
- How can we prove what they need? This allows them to form a **hypothesis**. (*deprive plants of these elements and see what happens*) Help the students plant the seedlings according to the directions below and then chart and compare the progress:
- **Control**: Plant 4 seedlings in 4 separate containers of potting soil. Label the containers "Control." Place them near a window and water as needed (soil should be moist, not soaked).

Fun Facts!

Did you know that plants make their own food?

Leaves use air, water, and sunlight in the food-making process called photosynthesis.

And only green plants, which have chlorophyll in them, can perform this amazing reaction!



- **Test for Light:** Plant 4 seedlings in 4 separate containers of potting soil. Label the containers “No Light.” Place them in a dark cupboard or closet. Water as needed.
- **Test for Water:** Plant 4 seedlings in 4 separate containers of potting soil. Do not water. Label the containers “No Water.” Place them near a window.
- **Test for Soil:** Plant 4 seedlings in 4 separate containers on a wet paper towel. Label the containers “No Soil.” Place them near a window. Add water to keep the towel wet.
- **Test for Shelter:** Plant 4 seedlings in 4 separate containers in potting soil. Label the containers “No Shelter.” Water as needed and place near a window. Depending on the weather conditions/season place the seedlings outside where there is little protection from the elements (ex.= temperatures that are too hot or too cold can inhibit a plant’s growth. Too much sunlight can also cause problems.)
- **Test for Space:** Plant 12-15 seedlings in *one* container of potting soil. Label the container “No Space.” Place the container near a window and water as needed.
- Now, test the **hypothesis**. As the plants begin to grow, measure and record their heights and appearance (weekly or daily). If students are not familiar with using measuring tapes or rulers, ask them to measure the plant height with strips of construction paper, which they can glue onto a poster board or larger piece of paper. This will become a bar graph, eventually.
- **Discussion:** Time to **draw conclusions**. Compare all of the plants after a determined period of growth/time. Discuss these questions:
 1. Which plants grew the most/least?
 2. Why do some plants look better than the others?
 3. What other differences do you see?
 4. What do plants need to grow? How do they get these things? What happens if they do not get these things?
 5. Where is the best place in the classroom to grow a plant? Why?



Activity #3: Agriculture is Part of Your Life

Besides all of the items that are listed in the background section that are produced by agriculture, remind students that many of the objects in the classroom, as well as several every day items we use, are also made as a result of agriculture. Plants provide us with food and drink (fruits, vegetables, grains), shelter (wood, grass houses), clothing (cotton, flax), every-day products (paper, cellulose, wood furniture), and medicine (cough syrup, aspirin).

- Pick an item in the classroom that is a product of agriculture and explain why it is such a product. Identify what it is made from. (ex.=A student’s chair might be made from wood that came from a tree that was raised on a tree farm. It was harvested and cut into pieces that would make a chair, etc.)
- Ask students to point out other items in the classroom. (Examples might include pencils, paper, tables, clothing, doors, paint, paint brushes, upholstery, ink, lotions, crayons, textbooks, chalk, desks, chairs, etc.) Talk about the items’ original sources and what might have had to happen to it to become what it is today. Label items around the room (Use items on last page of this lesson to photocopy and use on index card labels around the room.).
- Take a walk around the school and search for other items. See how many the students can find. They might surprise themselves! If they are having trouble finding items, pre-label some items around the school with index cards to help them along.

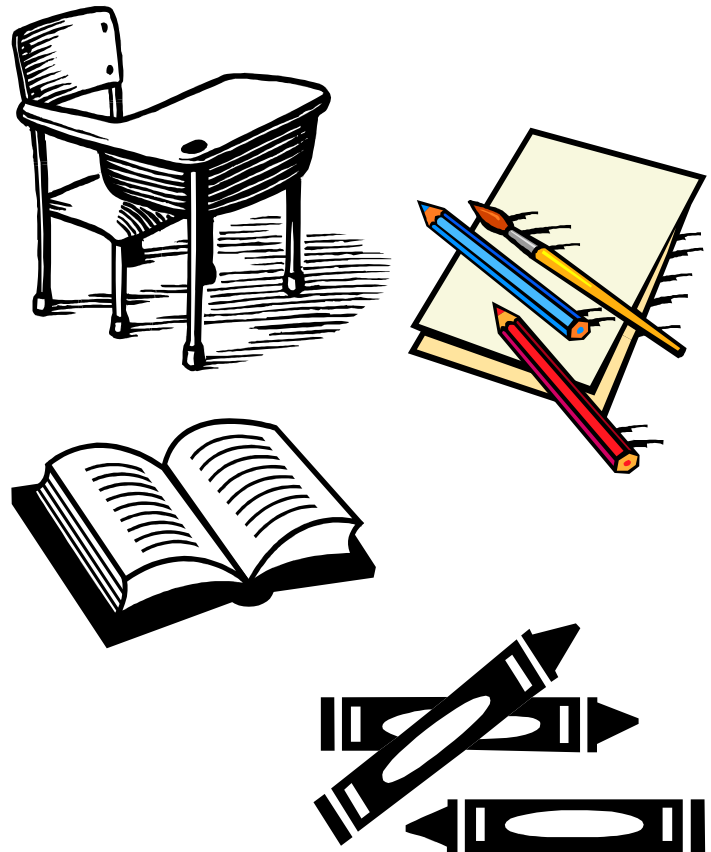
Extensions/Variations:

- **Activity #1 & #3:** Use the Venn Diagram activity to determine which items come from plants and which come from animals. Do any come from both?
- **Activity #2:** Choose one or two requirements to test for in the plant experiments. Compare the growth of the two seedlings and discuss what has caused the differences. It helps to have a “Control” plant to show how a plant will function if not denied the basic needs.
- **Activity #3:** Gather agricultural products that are made from specific sources (all tree items or all cow items) and set them on a table. Ask the students to pick out as many products from that source as they can. Chances are they will not think that all of the items are made from that one source. Discuss how the products are made and why some were obvious and others were not.

Evaluation:

Rubric: Our Basic Needs

3	2	1	0	The student can say or list at least 3 things that plants need to survive.
3	2	1	0	The student can compare the needs of plants to those of people.
3	2	1	0	The student can describe how people depend on agriculture for food, clothing, shelter, and other products.
3	2	1	0	The student can identify at least 3 items in the classroom that are products of agriculture.
12	8	4	0	Total Score: /12



Resources:

American Forest Foundation. (2003). Project Learning Tree: Environmental Education PreK-8 Activity Guide. American Forest Foundation: Washington, D.C.

Fun Facts About Agriculture. (2005). www.agday.org/tc/tc-funfacts.html

Pennsylvania Department of Agriculture. (2005). Marketplace For The Mind: An Agricultural Education Resource. www.marketplaceforthemind

Project food, land & people. (1998). Project Food, Land & People: Chandler, AZ.

