"PLANT A SEED IN TENNESSEE"

FIRST
GRADE
CURRICULUM
NOTEBOOK

First Edition

Tennessee Foundation for Agriculture in the Classroom
P. O. Box 313
Columbia, TN 38401
PREFACE:

The Tennessee Foundation for Agriculture in the Classroom was established to promote “agricultural literacy”, or a greater awareness, understanding, and appreciation of agriculture’s influence on our lives, to students throughout the state of Tennessee. The “Plant a Seed in Tennessee” First Grade Curriculum Notebook is just one of the educational resource materials that are available to educators through the Foundation. This material is designed to enhance classroom studies and presentations and to supplement the basic school curriculum. In addition to these materials, training workshops for teachers and other programs are available through the Tennessee Agriculture in the Classroom program.

ABOUT THIS MATERIAL:

This is the first edition of the new “Plant a Seed in Tennessee” curriculum notebook. We have updated the second draft with some new activities and correlations with the state standards to enhance its usability. The curriculum was introduced for the first time to participants in the 2001 Summer University Workshops for the purpose of receiving reviews and comments. The material has also been reviewed by others including the Agriculture in the Classroom Educational Consultants and the Tennessee Farm Bureau Women’s State Committee. Educational consultants from other states who are directly involved with the AITC program have reviewed the material. We are grateful to Ms. Elizabeth A. Wolanyk for her assistance in editing this first edition.

The notebook is divided into five sections: Animal, Careers, Environment, Plants, and Nutrition. The lesson plans include background information for teachers, a listing of the materials needed, directions on conducting the procedure, activity extensions and variations, lesson evaluations, and resources. Additionally, each lesson plan has been correlated to meet Terra Nova/Achievement Test teaching objectives.

We hope that you will find this material beneficial and effective in addressing state mandated objectives as well as introducing students to the important role that agriculture plays in our daily lives.

CONTACTS:

If you have any questions regarding this material or any other material or programs sponsored by the Tennessee Foundation for Agriculture In The Classroom, please contact:

Tennessee Foundation for Agriculture in the Classroom
P. O. Box 313
Columbia, TN 38401
Phone: 931.388.7872
Fax: 931.388.5818
or
visit our web site
www.tnfarmbureau.org
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“Pass the Peas, Please”

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SUPPORTING INFORMATION FOR TEACHERS:

If you were to ask your students, “From where does hamburger come?”, can you guess what their response would be?

In the early 1980’s, an informal survey was conducted to assess agriculture knowledge of Tennessee third grade students. The aforementioned question was one of the three questions asked. The most popular response to the question was ... McDonald’s, of course.

The results of this survey concluded not only that there was a need for a program such as Agriculture In The Classroom, but it also showed that students were unaware of the food products that come from animals, let alone the non-food by-products.

WHERE’S THE BEEF?

Beef cattle are one of America’s most popular agricultural commodities. Beef cattle are grown on more than 500,000 farms and ranches throughout the United States. While beef cattle are raised in Tennessee, the vast majority of beef cattle are raised in the western portion of our nation. Texas ranks first in the number of beef cows followed by Missouri, Nebraska, Oklahoma, South Dakota, Montana, Kansas, and Kentucky.

Tennessee ranks 9th in the U.S. in the number of beef cows with 1,030,000 according to 1999 statistics from the Tennessee Department of Agriculture. The American Farm Bureau Federation cites that one-fourth of the world’s beef supply is produced in the United States.

There are many different breeds of cattle. Many have been crossbred to yield hybrids with more desirable characteristics such as resistance to disease, ratio of fat to muscle, and improved growth rate. This is the same as breeding one specific thoroughbred horse to another to get a faster offspring or breeding one specific dog to another in order to get a specific color.

By crossbreeding, farmers use genetic selection to get a better quality cow and in turn, we as consumers get better quality beef. It is estimated that each person in the United States will consume about 62 pounds of beef in a year.

BEEF BY-PRODUCTS:

Beef is not the only product that we get from beef cattle. Interestingly, almost the entire beef animal can be used to benefit us in some way. For example, from a typical 1000-pound steer, only 400...
pounds (approximately) are used for beef that we eat. Beef is a good source of protein which builds, maintains, and repairs body tissue, and iron which helps the red blood cells of the body carry oxygen to other cells and tissue. Beef also provides the body with B-vitamins which promote healthy skin, a healthy nervous system, and are important for metabolism and digestion.

Additionally, beef contains zinc, a mineral, which is used by the body for growth and immune system maintenance.

Pot roast, sirloin steak, ground beef, ribeye steak, tenderloin steak, T-bone steak, and of course ... hamburger ... are common cuts-of-beef.

The other 600 pounds left over from the steer, not used as beef, are used as by-products. You probably use more beef by-products than you think! Here are just a few examples of beef by-products:

From bone, horn, hooves and gelatin, we get the ingredients to make the following items:

- combs
- gelatin (such as jello)
- marshmallows
- mayonnaise
- gelatin candy (such as gummy bears)
- photographic film
- steel ball bearings
- fine bone china
- pet food
- vitamin capsules/gel coatings

From the hide and hair, we get the ingredients to make the following items:

- insulation
- paint brushes
- industrial glue
- band-aids
- clothes
- shoes

- luggage
- saddles
- furniture
- automobiles
- volleyballs
- basketballs

From the fats and fatty acids, we get the following products:

- shampoo
- soap
- shaving cream
- cosmetics
- deodorant
- candles
- crayons
- floor wax

- detergent
- hydraulic break fluid
- plastics
- insecticides
- paints
- perfumes
- synthetic rubber

ACTIVITY 1: HAMBURGER HELPER
Getting Started:
• Make copies of the Hamburger Helper activity sheet located on page 4.
• Students will need pencils, crayons, or colored pencils.

Procedure:
• Ask the students if they like hamburgers.

• Share with them that they are going to vote on what they like to have placed on their hamburgers.

• Have the students identify which items they like best on their hamburgers (i.e. cheese, tomatoes, pickles, mustard, catsup, etc.) by placing a smiley face in the first column if they like it or a frowning face on the second column if they do not.

• Have students identify which items they like best on their hamburgers (i.e. cheese, tomatoes, pickles, mustard, catsup, etc...) Conduct a survey of responses to determine which items are the most popular to put on hamburgers and which are the least popular.

• You may wish to demonstrate on the board with one example. (If any students do not like hamburgers, you may suggest a substitute that commonly has condiments added.)

• After the students complete their sheets, you may want to convert the results into a classroom graph with smiley faces only, one smiley per vote.

• Summarize by asking, "What is the Animal ... page 2
most popular item, and what is the least popular item, are there any ties?, etc."

• Once complete, ask the students what is the source of beef. After their discussion, provide the answer if they do not know.

• Ask the students what else we get from beef? This leads to the next activity.

• Share with the students that we get much more from cattle than beef.

ACTIVITY 2: THEN AND NOW

Procedure:
• Ask the students, "How cattle were used in the past? What did we get from them?" Make a list. (Oxen pulled wagons and plowed fields. We got milk and dairy products, meat, leather and simple by-products such as cattle horns used to make powder horns to carry gunpowder.

• Now ask, "What did we use leather for?" (For items we would now make of plastic or metal: buckets; harnesses; horse collars; door hinges in colonial times; shoes; boots; clothing such as chaps, vests, hats, etc.)

• Explain that these are beef products and by-products. The products are the primary items that we raise cattle for, milk, dairy products and meat. The by-products are items that we also benefit from and produce to make good use of the animal and because these are quality products. For example, explain that we can make shoes from plastic but leather is more comfortable, wears well, looks good, is good for our feet, and is a renewable resource whereas plastic is not renewable.

• Take a virtual tour of the Tennessee Agricultural Museum on-line at http://picktnproducts.org/agmuseum/materials.html. Pay special attention to the "Everything Starts on the Farm" section and "From the Farm: What is it?" This will provide students with actual machinery and information about agricultural history and agriculture today.

• Have the students make a list of meats that they eat. Record these on the board. If they need help coming up with a variety ask them to go home and make a list up with their families as a homework assignment. Make the finished list visible.

• Now sort these meats as to where they come from beef, pork, poultry, lamb, deer, etc. Items such as sausages and hotdogs may take a little work to decode. Many sausages and luncheon meats are pork based but may also contain beef, poultry and turkey. This is even true for bacon, hotdogs, and items such as turkey ham.

• Make a master list and have the students conduct a survey of their family, another class, other teachers, cafeteria staff, librarian, etc. for their top five favorite meats. (Depending upon the ability level of the students you may want to make a picture code of the survey and limit the choices.) Make sure you have an "Other" category in case someone does not eat meat.

• Make a large classroom bar graph of the results. For each person who voted a particular meat their top five give that vote a square in the bar.

• Display the class graph in the hallway.

ACTIVITY 4: READY... SET...GO BEEF!

Getting Started:

To begin this activity, give the students a list of the products of beef animals, similar to the list in the supporting information. Conduct a “scavenger hunt” by having the students find beef by-products in the classroom and at home.

In addition to beef items, you will need to collect a number of non-beef products.

Materials needed:
• Beef by-products
• Non-beef products
• Three cardboard boxes
• Marker
• Whistle
• Gymnasium or large play area

Procedure:
• Discuss the items found and iden-
tify which part of the beef animal they come from.

• Put the collected beef products in one cardboard box. In the same box, put about the same number of non-beef products.

• Label one of the two remaining boxes “Team A”. Label the third box, “Team B”.
• Place all three boxes at one end of a gymnasium or play area.

• Divide the students into two teams positioned on the opposite side of the room from the three boxes.

• Announce to the students that this is a “Relay for Beef Products”.

• Explain when the whistle blows, the first person from each team will run across the gym to the box with mixed beef and non-beef products. The students will find one beef product and place it in the team box. The students will then run back to the team and send on the next student. The game is timed for a certain number of minutes. When time is up, the team with most beef products in their box wins!

• (Note: Make sure there are plenty of items in the box ... especially beef products so that every member of the team can play.)

• Stress to the students that they must know their beef products, and also be quick, to win the game!

ACTIVITY 5: MAP THIS

Procedure:
• Ask the students where they can buy beef and beef by-products as they have already learned. If they only think of stores ask them about restaurants.

• Have the students draw a map from their homes to the location where they can buy a beef product and a beef by-product. They may need help and can do this as a homework assignment with help from their family.

ACTIVITY 6: BULLY BINGO

Getting Started:
To begin, you will need to make copies of the “Bully Bingo” game cards located on the following pages. (Note: Be sure to use all the different cards to prevent your students from all “BINGOing” at the same time). You will need one copy for yourself along with two copies of the “Bully By-Products Board Pieces” sheet and a container. Additionally, you will need “markers” which can be anything from miniature marshmallows (a beef by-product) to M&Ms or buttons, etc..

Procedure:
• Discuss the introductory information with your students.

• Give each student one copy of the “Bully Bingo” card and “markers”, and make sure that the students can recognize the pictures on the cards.

• You or a designated reader then reaches into the container and draws out a by-product piece.

• Call it out to the group.

• Have the students look at the board to see if they have that by-product. If they do, they cover it up with a “marker”.

• The first student or students to have five squares in a row covered, either vertically, horizontally, or diagonally wins.

EVALUATION:
• Name some common types of beef that is eaten.

• Have the students create a picture of ways we used cattle in the past. Then have them create a collage of beef products and by-products used today. Create a bulletin board of their art titled "PAST and PRESENT."

• Why is beef so important to us?

• How many beef by-products can your students name?

• Evaluate the accuracy of the students’ maps from their homes to a location where they can buy beef and beef by-products.

EXTENSIONS AND VARIATIONS:
• Beef cattle are just one farm ani-
mal from which we get numerous by-products. Name some other farm animals and the by-products that we get from them.

- Utilize your “Farm Friends” volunteer directory or contact your county Farm Bureau office to invite a beef cattle farmer in your county or neighboring county to come speak to your class about raising beef cattle. Maybe he or she can bring a baby calf for your class to see ... so, don’t forget to ask.

- Nutrition: Compare the nutritional value of beef to other types of meat. Have your students identify the food group to which beef belongs.

- Math: Using the activity sheet included on page 12. Have students identify which items they like best on their hamburgers (i.e. cheese, tomatoes, pickles, mustard, catsup, etc...) Conduct a survey of responses to determine which items are the most popular to put on hamburgers and which are the least popular.

- Art and Careers: From the 6th discussion question above, have students draw the job they are most interested in using the activity sheet on page 13. Have them explain why they are the most interested in it. Note the various jobs and point out that each one is very important in the agricultural industry.

- Physical Education: To reemphasize what you have learned in this lesson, refer to page 1 of the Technology section in this notebook and do the “Ready ... Set ... Go Beef!” lesson activity.

- Create two sets of match cards. One set should have the word of the product or by-product on the front and a picture of the item on back, the second with the picture of the animal on one side and the product or by-product on the flip side. Use these to help students learn vocabulary and to identify which products and by-products come from one animal. The students could also create their own set of match cards.

- In activity 3 create two bar graphs, one of students and the second of adults to see what the differences are.

**RESOURCES:**


- www.beef.org


National Cattlemen’s Beef Association. 5420 South Quebec St., Greenwood Village, CO 80111. (303) 694-0305 or Fax
Hamburger Helpers

DIRECTIONS: Read the food in the left column. Draw a happy face in the middle column if you like that food on burgers. Draw a sad face in the right column if you do not like that food on burgers.

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<th>I like it!</th>
<th>I do not like it!</th>
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<tr>
<td>cheese</td>
<td>![Smiley Face]</td>
<td>![Sad Face]</td>
</tr>
<tr>
<td>catsup</td>
<td>![Smiley Face]</td>
<td>![Sad Face]</td>
</tr>
<tr>
<td>lettuce</td>
<td>![Smiley Face]</td>
<td>![Sad Face]</td>
</tr>
<tr>
<td>mustard</td>
<td>![Smiley Face]</td>
<td>![Sad Face]</td>
</tr>
<tr>
<td>tomato</td>
<td>![Smiley Face]</td>
<td>![Sad Face]</td>
</tr>
<tr>
<td>mayonnaise</td>
<td>![Smiley Face]</td>
<td>![Sad Face]</td>
</tr>
<tr>
<td>pickles</td>
<td>![Smiley Face]</td>
<td>![Sad Face]</td>
</tr>
<tr>
<td>Insulin</td>
<td>Machine Oil</td>
<td>Bone China</td>
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<tr>
<td>---------</td>
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<td>------------</td>
</tr>
<tr>
<td>Candle</td>
<td>Camera Film</td>
<td>Detergent</td>
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<tr>
<td>Glue</td>
<td>JELL-O</td>
<td>FREE!</td>
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<tr>
<td>Bandages</td>
<td>Paint</td>
<td>Steel Ball Bearings</td>
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<tr>
<td>Basketball</td>
<td>Cake Mix</td>
<td>Shaving Cream</td>
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<th>Cake Mix</th>
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<td>Margarine</td>
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<td>Leather Shoes</td>
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Animal ... page 10
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**BULLY BINGO!**
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Iron Pills  Cosmetic  Pet Food  Bone China
BULLY BINGO!

FREE!
My Favorite Beef
So, wool is used to clean up oil spills while the spilled oil is still floating on the surface of water. Wool also absorbs water and still keeps the skin feeling dry. This occurs because an air pocket surrounds the skin and makes the skin feel comfortable. So even if the wool is wet, the skin feels warm and dry.

Wool is a natural, renewable fiber. In other words, it exist in its present form and can be obtained over and over again relatively easy. Synthetic fabrics, such as acetate and rayon, are usually made from petroleum, which is non-renewable.

SHEEP HELP OUR ENVIRONMENT:

In addition to meat and wool, well-managed flocks of sheep are animals that help our environment. Since sheep do not have any front teeth, they do not pull out the roots of the plants when they eat grass and weeds. This helps the roots to grow a new plant. Sheep are also used in many areas where brush needs to be controlled. Many areas of the United States have problems controlling underbrush in forests and other areas. When there is too much underbrush, a forest fire can easily begin. In order to prevent these fires, the Forest Service uses sheep to feed on the brush. This helps to prevent forest fires and save hundreds of trees, plants, and wildlife.

BRIEF DESCRIPTION:

Sheep are used not only for food, but other non-food by-products as well. Wool is a renewable fiber resource, used to make warm clothes. As with other renewable resources, wool is important in maintaining a healthy environment. In this lesson students will gain an understanding of the importance and value of farm animals and renewable resources while learning that agriculture is about more than just food.

LEVEL:
First Grade

SUBJECT:
Science
Mathematics
Language Arts
Reading

SKILLS:
Applying, Classifying, Comprehending, Developing
Vocabulary, Following Directions, Identifying, Matching, Observing, Predicting, Reading, Recognizing Relations, Recording, Sorting, Using Numbers

OBJECTIVES:
The student will:
• predict whether products come from sheep or not and whether fabrics are natural or synthetic.
• list products and by-products (both food and non-food) produced from sheep.
• describe qualities of natural fibers and synthetic fibers.
• differentiate between renewable and non-renewable products.
• describe how sheep or their products can help the environment.

ESTIMATED TEACHING TIME:
Three sessions 45-60 minutes
Sheep, interestingly, have split hooves. This characteristic helps them to move about and climb rocky areas. The hooves also help to break up the soil, which in turn, spread seeds so new plants will grow. This action also helps plants obtain water and nutrients through the loosened soil.

Sheep’s fleece (wool before it is carded and spun into wool) is also used to soak up oil spills. Because wool absorbs, it can soak up almost three times its own weight in crude oil. Like the oil, the fleece will float and absorb oil instead of water because it already has its own coat of protective oil that contains lanolin. Before it becomes too heavy and sinks, it is picked up and the oil collected.

SHEEP BY-PRODUCTS:

Not only do sheep provide a supply of meat, many of the by-products that we use everyday come from sheep. Examples of these by-products include the following:

- upholstery
- chewing gum
- yarn
- insulation
- tennis balls
- baseballs
- industrial oils
- stearic acid
- cosmetics
- ceramics
- medicines and syringes
- crayons
- candles
- creams and lotions
- surgical sutures
- piano keys
- steel knives
- asphalt road
- tires
- adhesive tape
- buttons
- ice cream
- shampoo and conditioner
- crochet needles
- china
- cheese
- string instruments
- drums
- camera and film
- marshmallows
- soap

Australia, Russia, New Zealand, Argentina, South Africa, and the United States are the top six wool producing countries in the world (in that order). According to the Tennessee Department of Agriculture, in 1999 there were approximately 13,000 sheep on about 800 Tennessee farms. From these sheep 65,000 pounds of wool was produced. Sheep are estimated to be worth about $1.5 million to Tennessee producers.

ACTIVITY 1 — WHAT DO WE GET FROM SHEEP?

Procedure:

- Ask the students, "What do we get from sheep?" If they can’t answer, remind them of the nursery rhyme Baa, Baa, Black Sheep. (Meat [lamb, mutton], milk [made into cheese] and wool.)

- Ask the students, "Why do sheep have wool?" "What does the wool do?" (To keep them warm.)

- Ask the students, "Why do we shear sheep?" (To harvest the wool and keep the sheep cool.) Does it hurt the sheep? (No, it is just like you getting a hair-cut.)

- Ask the students, "What would happen if we didn’t shear the sheep?" (It would be like walking around in a winter coat during the hot summer.) "Would you like that?" (No, neither would the sheep. In fact, it would be dangerous to the sheep’s health.)

- Ask the students, "What are young sheep called?" (Lamb) Post the lamb picture and name.

- Ask the students, "What are adult sheep called?" (Female — ewe, Male - ram) Post the ewe and ram picture and name.

- Ask the students, "Does only the ram have horns?" (No, unlike many wild animals whether or not a male and female sheep has horns depends upon the breed of sheep.) "What is a breed?" (Reference breeds that they would know, dogs or horses. Sheep also have breeds, as do all types of farm animals. There are breeds of cattle, pigs, goats, chickens, etc.) (Usually, if a breed is horned both male and female will have horns.)

- Ask the students, "Are sheep and wool a renewable or non-renewable resource? Can wool be recycled or composted?" (renewable and yes to both)

ACTIVITY 2: SHEEP BUSTERS

Getting Started:

- To begin, you will need to make copies of the “Sheep Busters” cards located on pages 17-19 for each student.
• For this activity, students will also need a pair of scissors and a plain sheet of paper.

Procedure:
• On a half sheet of paper, have the students draw a picture of a sheep. On the other half, have the students draw a picture of a sheep with a line going through it (like the “Ghostbusters” symbol).

• Give each student a copy of the by-products pictures.

• Have your students cut the pictures apart on the dotted lines.

• Ask the students to group the pictures into two groups. The products that are made from sheep should be placed under the picture of the sheep. Likewise, the products that do not come from a sheep should be placed under the “no sheep” picture.

• Please note that this is a guess for your students. Remind them that it is most likely that no two people will agree on exactly the same groupings.

• Make a class graph (picture or bar) of the guesses.

• Determine which of the picture cards represent products made from the sheep.

ACTIVITY 3: MAN-MADE OR NATURAL?
Getting Started:
• To begin, you will need to obtain several different kinds of fabric pieces, both man-made and natural, each about 2”x3”. Some examples include acetate, polyester, and rayon. Be sure to include in your fabric pieces samples of silk, cotton, linen and wool -- the four main natural fibers.

• You will also need a piece of foam board or poster board.

• Glue the samples on a board and number each piece of fabric to make a guessing board.

Procedure:
• Discuss with your students the difference between man-made and natural products.

• Have each student examine the different fabrics and guess which ones are synthetic and which are natural.

• Discuss the answers with your students and explain the difference between renewable and non-renewable fabrics with them.

• Talk with your students about how each of the fabrics feel. Compare and contrast the feel of the man-made fabrics to the natural fabrics. Are there differences?

ACTIVITY 4: WET WOOL
Getting Started:
• To begin, cut a piece of wool and a piece of acetate into rectangles approximately 2”x3”.

• You will also need two cups or petri dishes and water for this activity.

Procedure:
• Have your students make predictions about how wool reacts with water. Record your answers on the board.

• Place each sample into a separate cup.

• Pour 1/2 teaspoon of water onto each sample and let them sit long enough so that all of the water is absorbed. The samples should all be wet but not dripping wet. Wring out any excess water.

• Remove each sample and place it on a person’s arm. For comparison reasons, it is best to have both samples on the same arm at the same time. Each person in the group should actually experience the feel of the materials.

• Ask your students the following the questions as the experiment is taking place:
  1. What did the two fabrics feel like on the skin?
  2. Which fabric felt the wettest?
  3. Which fabric felt the driest?
  4. Did any of the fabrics stick to the skin?
  5. Which fabric felt the warmest?
  6. Which fabric felt the coldest?
  7. Why do you think wool is a desirable fabric for clothing?
Note: The wool should have felt the driest and warmest. The acetate should have felt the wettest and the coldest. Wool fibers have scales on the outside of the fiber and are able to draw moisture to the inside of the fibers. This allows wool to absorb 30% of its weight in water. Since the water is drawn to the inside of the fiber, an air packet surrounds the skin and makes the skin feel comfortable. The skin feels warm and dry even if it is wet. This air pocket also helps during hot weather too—a person can perspire more, which helps him/her to cool down, because the wool absorbs the moisture. Cotton and acetate do not absorb moisture into the center of their fibers; therefore, a person feels cold and wet when they are exposed to moist fibers.

ACTIVITY 5 — THE BETTER PICKER-UPPER

Getting Started:

- Gather cotton, raw wool (fleece), wool fabric, poly fibers, food coloring or used motor oil.
- Decide if you would like to demonstrate whether wool absorbs dyes or oil or both. (To absorb motor oil from the top of a glass of water and compare the success of each fabric or material, unwashed, raw wool works best.
- If the fleece is washed, many of the natural oils are gone and the wool will absorb more water instead of oil.
- Used and dirty black motor oil would best mimic crude oil from an oil spill.
- If the oil is not selected as the experiment then the information will need to be shared with the students or completed as a demonstration to meet the last objective of the lesson.

- Divide the class into small groups.

Procedure:

- Provide samples of each type of fiber to the students. Have them feel the fibers and identify what each is made of. Make sure that you have a combination of both natural (wool, cotton, linen) and synthetic (polyester, nylon, rayon) etc.
- Ask the students, "Where did these fibers come from? Are they renewable or non-renewable?" (It varies with the fiber. All came from a natural resource. Polyester—oil, rayon—wood, cotton—plant, wool—sheep.)

- Explain that you are going to design an experiment and test to see which fiber works best (at either absorbing dye or oil or both).
- Ask the students to create a hypothesis (educated guess) as to which fiber absorbs the best. Have each group complete this task. Put their predictions in writing.
- If you have chosen the oil test ask, "If this were a real oil spill which fiber would absorb the most oil and would the fiber sink?" That is important in a real oil spill because if the fiber sinks too fast it doesn’t solve the problem it just relocates it from the surface of the water to underwater.
- Now ask the class, "How can we test it?" Design an experiment. Make sure you have a control to compare the results with. Also make sure that as much as possible all things are equal (equal number of square inches of fabric, equal weight of fabric, equal amounts of water and dye, same color of dye, etc.)
- Test the experiment following the students’ design. Record the results. Compare results with the hypothesis.
- Evaluate the experiment to see if it should be changed to come up with a better result.
- Which fabrics absorbed best? (If the oil test was chosen discuss whether or not real wool is used in this fashion. It is, see supporting information.)

EVALUATIONS:

- Name three products that come from sheep.
- What is the difference between “synthetic” and “natural”?
- Explain the difference between “renewable” and “nonrenewable”. Why do we consider wool to be renewable?
• What are some ways that sheep help the environment?

EXTENSIONS AND VARIATIONS:
• Utilize your “Farm Friends” volunteer directory or contact your county Farm Bureau office to invite a sheep farmer in your county or neighboring county to come speak to your class about raising sheep. Maybe he or she can bring a baby lamb for your class to see ... so, don’t forget to ask.

• In activity 1, instead of having the students create their own categories on their own paper, have the whole class make a classroom graph by providing the items in a heading row on the bulletin board and having the student vote yes or no with their sheep underneath each item. This can be made into a bar graph of their predictions and you can indicate which are truly items from sheep.

RESOURCES:


Mohair Council of America. 233 Twohig, P.O. Box 5337, San Angelo, TX 76902. (915) 655-3161. http://www.mohair.com


Sheep Busters

Balloons
Soap
Shoes
Tree
Cookies
Road
Sheep Busters

Buttons

Crayon

Ice Cream

Wool
Scarf and Mittens

Baseball

Piano Keys
Sheep Busters

Syringes

Ceramics

Candles

China

Horse Saddle

Bread
SUPPORTING INFORMATION FOR TEACHERS:

Like corn, wheat, soybeans, cattle, sheep, and other farm commodities, hogs are important to agriculture and to our daily lives. They provide not only meat and other foods for us, but supply us with numerous by-products as well.

HOGS FOR GOOD HEALTH:

As a food item, pork is important because it has high amounts of protein, B-vitamins, and thiamin. In fact, pork has three times as much thiamin as many other food. Thiamin is important in our diet because it changes carbohydrates into energy and encourages a normal appetite.

Bacon, sausage, ham, and pork chops are some favorite foods that come from hogs. Interestingly, there are about 500 different by-products that come from hogs as well. Some examples include fertilizers, glass, china, floor wax, chalk, crayons, and medicines.

HOG BY-PRODUCTS:

Hogs are very much like humans because their heart and other organs work the same way. Many times, a hog’s heart valve is used by doctors to replace a human heart valve during surgery. Pigskin is used to treat people who have been burned. Some types of insulin, used by diabetics to maintain blood glucose levels, also comes from hogs. Research has shown that more often than not, if a certain medication helps pigs and hogs, then chances are great that it will help humans also.

INTERESTING PIG POINTS:

It is believed that the hog was one of the first animals to be domesticated. Hogs were introduced in America by explorer Hernando De Soto around 1539. Today, hogs are raised all across the United States. Typically, a sow will give birth to litters of piglets twice a year. Each litter usually has seven to ten piglets. Giving birth to piglets is called farrowing. Pigs are weaned when they are two to four weeks old. Until a pig reaches 120 pounds, it is known as a pig. When a pig weighs more than 120 pounds, it is called a hog. Hogs are usually taken to market when they weigh 240-260 pound. There are approximately 600,000 hog farmers nation wide. Hogs and pigs make up 14% of all production commodities on America’s farms.

AN AGRICULTURE COMMODITY:

According to the Tennessee Department of Agriculture’s 2002 Statistics Report, there were approximately 225,000 pigs and hogs in Tennessee. Tennessee ranks 24th in the U. S. in the number of pigs and hogs. Pigs and hogs are fed social studies: economics 2.03 (3.2 spi.1)
mathematics - number and operations 1.1, 1.2, 1.3 (3.1 spi.2, 3) algebra 2.0 (1.2.1 a)
english/language arts: reading 1.01a, c, d, 1.02 a, e, 1.05 a, c, 1.07 a, 1.08 a, d,
science: life science 1.1, 1.2 ((3.1 tpi.1, 2, 3,7

BRIEF DESCRIPTION:

Children & farm animals such as hogs have similar nutritional needs. Both hogs and humans are simple-stomached animals that need to consume almost all of their nutrients in their diet. (There are a couple of exceptions, e.g. the human body’s ability to produce vitamin D in the presence of sunlight.) They both need 1) protein - growth, 2) carbohydrates & fats - energy, 3) minerals - bones & healthy tissue, 4) vitamins - develop & maintain immunity & body systems. In this lesson, students will learn that farmers take good care of their animals by providing them with a healthy diet, that the nutritional needs of hogs are similar to that of humans, why hogs roll in the mud and complete math activities.

LEVEL:

First Grade

SUBJECT:

Science, Social Studies, Language Arts

SKILLS:

Addition, Classifying, Comparing Comprehending, Reading Charts and Graphs, Following Directions, Identifying, Listening, Matching, Observing, Reading, Recognizing Relationships,

OBJECTIVES:

The students will:
• compare hog nutrition to human nutrition and describe how they are similar.
• produce a feed sack containing human food that represents the feeds consumed by hogs.
• complete calculations as outlined.
• explain how pigs & hogs keep cool & why.

ESTIMATED TEACHING TIME:

Two 60-minute sessions
a balanced diet so they can grow healthy and strong
in order to reproduce and provide meat (protein) for
humans. The typical diet consists of a mixture of
corn, soybean meal and additional vitamins and min-
erals to increase growth and improve health. Protein
is needed for growth; brain, nerve, and eyesight devel-
oped; hair growth; to grow strong muscles and
bones; growth of skin; and the development of a
healthy immune system. Hogs are fed soybeans, oats,
and other grains to gain protein. Humans eat meat,
eggs, beans, soybeans, peanuts, and dairy products
to obtain the protein they need. Carbohydrates and
fats are needed to provide energy. Hogs are fed corn,
fruits and fats to meet their energy needs. Humans eat
sweets, fats, breads and other starchy foods to meet
their energy needs. It is recommended that less than
thirty percent of our energy (calories) come from
fats. Minerals are necessary for development ofones and teeth, as well as regulating body systems.
Hogs are fed mineral supplements and food process-
ing byproducts to supply their mineral needs. Humans
that eat a well balanced diet including a variety of
foods (dairy, meat, vegetables, fruits, etc.) usually
meet their mineral needs without need for supple-
ments. If someone does not eat a well balanced diet
they may need to supplement their diet with iron, cal-
cium or some other mineral. Vitamins are chemicals
that are needed in very small amounts and assist
the body in protecting itself against disease. Hogs
are fed vitamin supplements if their diet is low in a
particular vitamin. Again if humans eat a well bal-
anced variety of foods they will meet all of their vita-
min needs. The recommended servings of meat, dairy
products, fruits and vegetables provide more than
enough for most people. Some cereals and milk prod-
ucts are fortified with minerals and vitamins that are
lost during processing. Hogs and humans need water!
It does not provide energy, protein, vitamins or much
minerals but it is very essential. Humans and animals
can live much longer without food than they can with-
out water. Producers raise hogs today that weigh
more, grow more efficiently, and yield more lean meat
than ever before.

In addition to a good diet, careful breeding
practices have helped to genetically improve livestock
products. Like all other farmers, hog producers oper-
ate a business. Much time and effort is spent work-
ing to produce a high quality product at a reasonable
price as they have to provide for their families as well.

Research and development are helping the hog indus-
try find new product uses (value-added products) to
increase economic opportunities.

ACTIVITIES

INTRODUCTION

• Ask the students, "What do we get from pigs or
hogs?" (bacon, ham, pork chops, etc.)

• Ask the students, "What is the difference between
pigs and hogs?" (Pigs are usually young swine under
120 pounds, hogs are older and larger usually over
120 pounds.)

• Ask the students, "What is the young pig called?"
(piglet)

• Ask the students, "What is the young female pig
called?" (gilt)

• Ask the students, "What is the female pig called
when she gets older and has had a litter of piglets?"
(sow)

• Ask the students, "What is the male pig called?"
(boar)

• Have the students label the swine on the "What are
they called?" student page.

ACTIVITY 1: HOG FEED SACKS

Getting Started:

• To begin this activity, you will need to gather the
following materials together:

  • Copies of “Hog Feed Labels”.
    (You will need one label per student.)
  • “Blue Jellybeans
  • Candy Corn
  • Ground Peanuts
  • M&M’s
  • Raisins
  • Puffed Wheat Cereal
  • Re-sealable Plastic Bags
  • Yarn or String (22” pieces -- one per
    student)

Procedure:

• Ask the students what they need Animal ... page 26
to grow big and strong, run fast, and think well. (Answers will vary.)

• Make a list on the chalkboard that has the words "grow, strong, bones, teeth, run, see, think, stay healthy."

• Share information from the supporting information to describe what nutrients we need to be able to be or have each of these items and where we get those nutrients. For example: strong bones and teeth - minerals and vitamin D - milk.

• Compare what humans need and what hogs need. Are they similar?

• Help the students make their own “Hog Feed Sacks.” Give each student a piece of string or yarn, a resealable plastic bag, and a copy of the “Hog Feed Label.” Have the students punch hole sin the top left and right corners of their plastic bag. String one end of the string/yarn through the left hole and tie, then string the other end of the string/yarn through the right hole and tie.

• After the students assemble and discuss their “Hog Feed Sacks,” they should put the jellybeans, candy corn, ground peanuts, raisins, M&M’s, and puffed wheat into their feed bags to represent the diet of hogs. They can eat their goodies now or save them for a snack to eat later as you read the story of the “Three Little Pigs.”

• Compare what humans need and what hogs need. Are they similar?

ACTIVITY 2: MAKE MUDDY PIGS

Getting Started

• Using the pig pattern on pages 34-35 have your students trace the pattern on pink construction paper and cut the pig out.

• Using brown tempera paint, watercolors, or chocolate pudding, have the students fingerpaint “mud” on their pigs.

• Use pipe cleaners to make a curly tail and glue to the pig.

• Discuss with your students why pigs lie in mud.

(If the bowl has no sweat glands. When they get hot they cannot sweat to cool off like you can. Pigs and hogs can also get burned because their hair is not a dense coat like a cow or horse has. So, to naturally keep cool and not get sunburned pigs dig in the earth and make mud wallows. Today, producers keep the pigs and hogs shaded and sprinkle them with water to accomplish the same goal, but help the swine stay clean. Hogs are naturally the cleanest of all farm animals if this method of cooling is provided.)

• Ask the students, “How do other animals cool off?” (horses — sweat, dogs - pant, elephants — fanning their huge ears helps with cooling and act as radiators, birds-migrate to cooler climates, and insects hide in the shade.)

• Ask the students if this is the same with people or different. People need to protect themselves from the sun. But we can sweat to cool off. How do we protect ourselves from too much sun?

ACTIVITY 3: PORKY PIGSKIN PROBLEMS

Getting Started:

• To begin this activity, you will need to make copies of the “Porky Pigskin Problems” on pages 24-33. There is a math activity sheet for numbers 1-10.

Procedure:

• Review addition math facts with your students.

• Have your students complete the problems on the page following the directions included. Use this opportunity to discuss the by-products that come from pigs, like footballs.

EVALUATION:

• How do farmers care for hogs and pigs?

• What do they eat?

• Why is a good, nutritious diet just as important to hogs and pigs as it is to humans? Why is pork an important part of our balanced diet?

• Is a healthy diet as important to other livestock as it is to hogs and pigs?

• How do pigs cool off and what do farmers do to help them cool off but still stay clean? Animal... page 27
• How are hogs and pigs helpful to humans besides from just a food standpoint?

EXTENSIONS AND VARIATIONS:
• Utilize your “Farm Friends’ volunteer directory or contact your county Farm Bureau office to invite a corn farmer in your county or neighboring county to come speak to your class about raising pigs. Don’t forget to ask ... he or she may be able to bring a piglet to your classroom for your students to see.

• Nutrition: Identify where pork is located on the food guide pyramid. How many servings should you have from this food group each day?

• Art: Make Muddy Pigs. Using the pig pattern on pages 34-35 have your students trace the pattern on pink construction paper and cut the pig out. Using brown tempa paint, watercolors, or chocolate pudding, have the students fingerpaint “mud” on their pigs. Use pipe cleaners to make a curly tail and glue to the pig. Discuss with your students why pigs lie in mud.

RESOURCES:


• Tennessee Department of Agriculture 2002 statistics (August 2002).

What are they called?

Name ________________________________

What are they called?

__________

________________________

Animal ... page 29
What hogs need: | Represented by:
--- | ---
Water | Blueberry Jellybeans
Carbohydrates | Candy Corn and Puffed Wheat Cereal
Protein | Peanuts
Minerals | Raisins
Vitamins | M&M’s
Porky’s Pigskin Problems

DIRECTIONS: Help Porky solve each math problem. If the sum is an odd number color the football brown.

7 + 2 = 1 + 0 =
4 + 0 = 1 + 1 = 5 + 2 =
3 + 1 = 2 + 1 = 4 + 2 =
6 + 4 = 2 + 2 = 0 + 1 =
**Porky’s Pigskin Problems**

**DIRECTIONS:** Help Porky solve each math problem. If the sum is an odd number color the football brown.

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
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</table>
| $7 + 2 =$ & $1 + 2 =$ &  
| $4 + 0 =$ & $1 + 1 =$ & $5 + 2 =$ 
| $3 + 1 =$ & $2 + 0 =$ & $4 + 2 =$ 
| $6 + 4 =$ & $2 + 2 =$ & $0 + 2 =$ 

**NAME:** ____________________________
Porky’s Pigskin Problems

DIRECTIONS: Help Porky solve each math problem. If the sum equals 3, then color the football brown.

NAME: ____________________________

7 + 2 = 1 + 2 =

4 + 0 = 2 + 1 = 5 + 2 =

3 + 1 = 3 + 0 = 4 + 2 =

6 + 4 = 2 + 2 = 0 + 3 =
**Porky’s Pigskin Problems**

DIRECTIONS: Help Porky solve each math problem. If the sum equals 4, color the football brown. If it is an odd number color the football blue.

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
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<tbody>
<tr>
<td>$7 + 2 =$</td>
<td>$1 + 3 =$</td>
<td></td>
</tr>
<tr>
<td>$4 + 0 =$</td>
<td>$8 + 1 =$</td>
<td>$5 + 2 =$</td>
</tr>
<tr>
<td>$3 + 1 =$</td>
<td>$5 + 0 =$</td>
<td>$1 + 2 =$</td>
</tr>
<tr>
<td>$6 + 4 =$</td>
<td>$2 + 2 =$</td>
<td>$0 + 4 =$</td>
</tr>
</tbody>
</table>
**Porky’s Pigskin Problems**

DIRECTIONS: Help Porky solve each math problem. If the sum equals 5, then color the football brown. If the sum is an even number color the football red.

<table>
<thead>
<tr>
<th>Football</th>
<th>Equation</th>
<th>Football</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image1" alt="Football" /></td>
<td>$7 + 2 = 9$</td>
<td><img src="image2" alt="Football" /></td>
</tr>
<tr>
<td><img src="image3" alt="Football" /></td>
<td>$4 + 1 = 5$</td>
<td><img src="image4" alt="Football" /></td>
</tr>
<tr>
<td><img src="image5" alt="Football" /></td>
<td>$5 + 2 = 7$</td>
<td><img src="image6" alt="Football" /></td>
</tr>
<tr>
<td><img src="image7" alt="Football" /></td>
<td>$6 + 4 = 10$</td>
<td><img src="image8" alt="Football" /></td>
</tr>
<tr>
<td><img src="image9" alt="Football" /></td>
<td>$1 + 2 = 3$</td>
<td><img src="image10" alt="Football" /></td>
</tr>
</tbody>
</table>
**Porky’s Pigskin Problems**

DIRECTIONS: Help Porky solve each math problem. If the sum equals 6, then color the football brown, if the sum equals 4 color the football red, if the sum equals 7 color the football blue.

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
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</thead>
<tbody>
<tr>
<td>7 + 2 =</td>
<td></td>
<td>6 + 0 =</td>
</tr>
<tr>
<td>3 + 3 =</td>
<td>1 + 5 =</td>
<td>5 + 2 =</td>
</tr>
<tr>
<td>3 + 1 =</td>
<td>2 + 1 =</td>
<td>2 + 4 =</td>
</tr>
<tr>
<td>0 + 6 =</td>
<td>4 + 2 =</td>
<td>5 + 1 =</td>
</tr>
</tbody>
</table>
Porky’s Pigskin Problems

DIRECTIONS: Help Porky solve each math problem. If the sum equals 17, then color the football brown.

17 + 2 =

16 + 10 =

13 + 4 =

12 + 5 =

15 + 2 =

16 + 1 =

12 + 11 =

13 + 5 =

14 + 2 =

10 + 7 =

6 + 11 =
DIRECTIONS: Help Porky solve each math problem. If the sum equals 20, then color the football brown.

17 + 4 =  
16 + 10 =  
13 + 7 =  
12 + 8 =  
15 + 12 =  
16 + 4 =  
12 + 11 =  
13 + 9 =  
14 + 6 =  
10 + 10 =  
11 + 11 =  

NAME: ____________________________
Porky’s Pigskin Problems

DIRECTIONS: Help Porky solve each math problem. If the sum equals 25, then color the football brown.

17 + 8 = 16 + 10 =

13 + 12 = 12 + 13 = 15 + 12 =

16 + 6 = 14 + 11 = 10 + 15 =

14 + 12 = 10 + 17 = 16 + 11 =
DIRECTIONS: Help Porky solve each math problem. If the sum equals 100, then color the football brown.

70 + 22 = 90 + 10 =

13 + 87 = 44 + 55 = 50 + 50 =

17 + 37 = 88 + 12 = 40 + 60 =

10 + 20 = 14 + 44 = 50 + 20 =
Muddy Pigs
Muddy Pigs
HORSIN’ AROUND WITH MATH AND TECHNOLOGY

Social Studies - Economics 2.03 (3.2 tpi.5); History 5.0 (3.5 spi.1, tpi.1, 2)
Mathematics - Algebra 2.5; Measurement 4.1, 4.2 (3.4 spi. 3)
English/Language Arts - Reading 1.1.01a, c, d, 1.1.02 a, e, 1.1.08 a, d,
Science - Life Science 1.1, 1.2 (3.1 spi.2, tpi.2, 3, 7) 2.2 (3.2 spi.3, tpi.2, 6) 5.1, 5.2 (spi.1, 3 tpi. 3)

Supporting Information for Teachers:

With less than 2% of the American population involved in production agriculture, have you ever wondered how food can continue to be so plentiful? It’s no accident that today’s farmer can farm more land and produce more food, more efficiently than ever before. Much of the credit for this feat has to go to technology. Agriculture has benefited from many improvements in technology -- pest-resistant crops, global positioning satellite systems and farm machinery are just a few.

A History of Horse Power:

For nearly 200 years, the horse was our only supply of power on the farm, or for transportation thus the expression "horse power". Until the tractor was developed in the early 1900s, the workhorse supplied the power to pull farm implements over every acre of soil planted. As settlers came to America, the horse, oxen, or mules were depended upon for transportation, to pull heavy wagons, and to help clear the land and plow the fields. Often, they provided the only link between settlements and towns. Even after our railway systems developed, horses were the most popular means of transportation. Our early street cars and fire engines were also "horse powered".

In the “good old days”, a farmer would have to keep as many as six teams of horses for farm labor. That meant spending an hour each morning just to feed and harness the horses before going to work in the fields. It took another hour at the end of the day to care for the animals.

Think about this ... farmers couldn’t work past daylight and the horses ate as much as 20% of the crops the farmers had worked to grow. Despite their usefulness, during harvest times, as many as 20 extra people might be needed to help do the work on a 440 acre farm.

It would seem that the invention of the tractor would be the perfect solution. But actually, the change from horses to mechanical horsepower was a very slow revolution. Tractors were first introduced in the Midwest around 1900. Unfortunately, these machines, which were generally powered by steam, proved to be too cumbersome and inefficient to operate. It wasn’t until the middle 1930s that tractors improved enough to surpass horses as a labor source.

If farmers had to rely on horse power to produce food today, our nation would need 20 times the number of horses and five times the number of farm workers. Grain

BRIEF DESCRIPTION:
At one point in time, the horse was considered to be the most efficient, quickest, and best source for transportation and agricultural work. Now replaced by automobiles and tractors, the horse has found a new role in the ag industry. In the lesson, students will learn about horses and the role they played in society long ago and today. They will gain an understanding of how important technology is to agriculture.

LEVEL:
First Grade

SKILLS:
Applying, Collecting data, Comprehending, Computing, Concluding, Cooperative Learning, Reading Charts, Developing Vocabulary, Following Directions, Identifying, Interpreting, Listening, Measuring, Observing, Predicting, Reading, Recognizing Relations, Recording, Using Numbers

OBJECTIVES: The Student will
• describe the way technology has changed how horses are used on farms today.
• identify and illustrate equipment used today that replaces animal power of the past.
• recognize that there are breeds of horses.
• describe how horse anatomy helps the horse.
• measure themselves using the method employed by horsemen to measure horses.
• compare their measurement in hands to a breed of horses.
• read and decipher a chart.

ESTIMATED TEACHING TIME:
Three 40 minute sessions
prices would increase more than 50 percent.

In 1920, two people and eight horses were required to farm 160 acres. Today, one farmer, alone, can farm over 400 acres.

WHAT’S A HORSE TO DO NOW?

Despite the fact that we no longer use a horse and plow to produce the food we eat, horses are still important to agriculture. They are used on cattle ranches for roping and branding cattle and rounding up herds. They are used in big cities, like Nashville, by police to patrol busy areas often clogged with traffic. They are used in sporting events such as polo and horse racing. Horses are also used for recreation.

ALL ABOUT HORSES:

There are more than 150 breeds and types of horses and ponies. These various breeds are divided into three main groups. Light horses have thin legs, small bones, and typically weigh less than 1300 pounds. Heavy horses have large bones, thick, sturdy legs, and weigh more than 2000 pounds. Ponies are small horses that stand less that 58 inches high when fully grown and weigh less than 800 pounds at maturity.

Horses have strong teeth, sharp ears, keen eyes, and a good sense of smell. It has larger eyes than any other land animal except the ostrich and the two eyes can move independently. A horse can look forward with one eye and backward with the other. They have wide nostrils to help them breath easily and smell predators well. Horses also have long, muscular legs that give them strength to pull loads and run at fast speeds.

Horses are measured in a unit called hands. A hand is measured across the width of the palm from side to side at the knuckles with the thumb folded under out of the way, not the length of the hand from fingertip to wrist. One hand equals four inches. The horse is measured from the ground to the highest point of the withers, which is the ridge located between the shoulder bones.

A mare is a female horse that is more than four years old. A pregnant mare will carry her foal for about 11 months. A foal is a newborn male or female horse. Foals are able to stand shortly after they are born and within a few hours they can run about. The foal then becomes a colt, which is a male under four years of age, or a filly, which is a female horse less than four years old. A stallion is a male horse, over the age of four, that can still reproduce offspring. A gelding is a male horse, also over the age of four, that is sterile.

Since a horse loses salt when it sweats, they need access to salt to stay healthy. They eat grass, grain, hay and oats and drink 10 to 12 gallons of fresh water per day. A horse has a small stomach and can only hold about 18 quarts of food.

Tennessee ranks third in the United States in the number of equine (including horses, donkeys, and mules), following Texas and California. The Tennessee Walking Horse was the most popular breed of horse in the state, followed closely by Quarter Horses with the two combining for more than half (53%) of the State’s total equine. The total value of Tennessee’s equine in 1999 was estimated at $515 million.

ACTIVITY 1: “WHAT REPLACES HORSES?”

Getting Started:

• Make copies of the “What Replaces Horses?” student page, one per student. Make sure crayons or colored markers are available.

Procedure:

• Ask the students, "How do we use horses today?" (Mainly recreational - pleasure riding, hunting, racing, etc. Although some [e.g. Amish] still use draft horses for draft work, horses are used for work by the police and on ranches to work cattle. There is also a strong movement in some parts of the country to use horses for draft to minimize environmental impact. For example, in selectively cutting hardwood trees in a forest, draft horses are used to pull the logs out of the woods instead of heavy machinery in sensitive areas.)

• Ask the students, "How did we use horses in the past?" What did we do before we had trucks and tractors and cars? (Transportation, draft, recreation.)

• Have the student complete the
"What Replaces Horses?" page by illustrating the modern vehicle or equipment that replaces the horse. If they need help provide some clues. (horse and wagon — 18-wheel truck and trailer, or panel truck, or pick-up truck loaded with something, horse plowing — tractor and plow, person riding a horse — car, pick-up truck, SUV)

• Or, have students complete this activity page by cutting items out of a magazine or newspaper and pasting them in place.

ACTIVITY 2: "ANATOMY HELPS"
Getting Started:
• Post photos or artwork of horses around the classroom. Many breed associations will provide these free of charge with a letter of request.

Procedure:
• Discuss with students the parts of the horse, how horses are similar to humans and other animals and how they are different.

• Ask the students, " How is a horse different from a pig or a sheep?" (taller, longer, longer legs, longer neck, different tail, large eyes, large nostrils, etc.) Let the students give all of their observations.

• Ask the students, " What do these differences do for the horse? How do they benefit the horse" (longer legs - it can walk and run faster, longer neck — it helps to balance the horse when it is running and it puts the horses eyes and ears up higher, different tail- it can swish away insects, large eyes — it can see farther and in many directions at once, large nostrils - it can smell better and breathe better when it runs, etc.)

• Demonstrate the impact of these differences by having the students squat down. Ask them how far away they can see and what they can see. Now have them stand up and report how far they can see and what they can see. Ask them who could see farther a pig or a giraffe? Why would this help an animal? (Animals living on a grassy plain like the horse and giraffe would see farther and be able to see predators stalking them so they could run away in time. Both the giraffe and horse run from danger.)

• Ask the students, "Why aren’t all animals tall with long necks?" (Not all animals live in this environment. Some have horns to fight off predators, some hide and are camouflaged in their coloring, some live in areas that are hard to get into, some can fly away, etc.)

• Ask the students, " What would happen if the horse were shorter, had a short neck, short legs, eyes only in the front of its head like humans?" (It wouldn’t run as fast and escape so often, it would always have to be looking around, etc.)

ACTIVITY 3: "WHAT BREED OF HORSE ARE YOU?"
Getting Started:
• Make copies of the “What Kind of Horse Breed Are You?” worksheet. Distribute one copy to each student in your classroom.

Procedure:
• Discuss general horse information and the significance of the transformation from “horse power” to tractor power. Explain to students that people have used different ways to measure throughout history and use different methods today, English versus metric for example. Explain that we are going to learn how horses are measured by measuring each of you in the way horses are measured and see according to method which breed of horse you might be.

• Ask the students, " What is a breed of horses?" Relate horse breeds to a familiar animal such as dog breeds. Give them examples.

• Explain to your students how horses are measured. "Hold out your hand as if to shake hands with someone. Now fold your thumb under, out of the way. Keep it that way and place that hand on your stomach at your waist. Repeat this with your other hand. Now stack this hand above the other one on your stomach. Count one, two. Release the bottom hand and stack it above the second hand, count three and continue to your chin counting as you go. This is how a hand is used to measure.

• Ask the students, "How many hands is it from your waist to your chin?"

• Divide the students into groups of two.

• Have the students take turns
measuring one another, using their hands, by starting at the ground and measuring to the top of their shoulders ... like a horse is measured.

• Have the students find their height in hands on the worksheet. The students will then discover what type of horse they are.

EVALUATION:
• How is a horse measured?

• How were horses important to agriculture in previous generations?

• What has replaced the horse to make agriculture more productive?

• How are horses important to agriculture now?

• Draw parts of the horse and write a word or phrase that describes how the shape, size or position of this part helps the horse. (e.g. draw an eye and words could be "see far" or "see all around")

EXTENSIONS AND VARIATIONS:
• Utilize your “Farm Friends” volunteer directory or contact your county Farm Bureau office to invite a horse farmer in your county or neighboring county to come speak to your class about raising horses. Maybe he or she can bring a horse to visit your classroom -- don’t forget to ask!

• Math -- Using hand units, have your students measure other objects in the classroom such as tables, chairs, computer monitors, bulletin boards, bookshelves, etc...

• Social Studies -- For this activity, you will have to do a little research. Use the horses listed on the worksheet. Find where the horse originates, the classification of their horse (light, heavy, pony), what their horse is known for (racing, pulling loads, etc...), how much their horse weighs, and what color their horse is. Show a picture if possible.

• Art/Language Arts -- Design your own horse. What kind of horse would your students like to be? A great stallion that can fly? Or maybe a pink horse with sparkles? Using the horse picture on page , have your students create their own horse and make up a story about their horse. Where is their horse from? What does their horse do? How big or small is their horse? Etc ...

• Nutrition -- Make your own horse feed sack. Horses eat and drink water, corn, oats, hay, sugar beet pulp, and bran. These foods provide for their nutritional needs.

  • Water -- water
  • Corn -- protein and carbohydrates
  • Oats -- protein and vitamin B
  • Hay -- protein, minerals and vitamins
  • Sugar Beet Pulp -- carbohydrates
  • Bran -- protein and carbohydrates

Have your students make their own feed sack by substituting horse feed for human food. You will need the following materials and food items:

  • ZipLock snack bag
  • Blueberry jellybeans = water
  • Candy corn = corn
  • Granola = oats
  • Shredded Wheat = hay
  • M&M’s = sugar beet pulp
  • Cheerios = bran

Go step further ... have your students identify these items on the food guide pyramid. What food group do they belong?

RESOURCES:

• Tennessee Department of Agriculture 2002 statistics (August 2002)

• Tennessee Walking Horse Association Web Site -- www.twhbea.com
My name is _________________________________.

My horse’s name is _____________________________________________.

My horse likes to eat _____________________________________________.

The color of my horse is _________________________________________.

Animal... page 47
### What Breed of Horse are You?

<table>
<thead>
<tr>
<th>Height Range</th>
<th>Breed</th>
</tr>
</thead>
<tbody>
<tr>
<td>9 to 11 hands</td>
<td>Shetland Pony</td>
</tr>
<tr>
<td>11 to 13 hands</td>
<td>Pony of the Americas</td>
</tr>
<tr>
<td>12 to 14 hands</td>
<td>Hackney Pony</td>
</tr>
<tr>
<td>14 to 15 hands</td>
<td>Tennessee Walking Horse</td>
</tr>
<tr>
<td>15 to 17 hands</td>
<td>Thoroughbred</td>
</tr>
<tr>
<td>16 to 19 hands</td>
<td>Belgian</td>
</tr>
</tbody>
</table>

1. How tall are you?  
   Draw a red circle around your answer.

2. What kind of horse are you?  
   Draw a red square around your answer.

3. How tall is your classmate?  
   Draw a blue circle around your answer.

4. What kind of horse is he or she?  
   Draw a blue square around your answer.

5. How tall is your teacher?  
   Draw a green circle around your answer.

6. What kind of horse is your teacher?  
   Draw a green square around your answer.
What replaces Horses?

On the right side of the page draw (or cut out and paste) the machine that replace the horse for the work pictured on the left.
THE RECYCLERS

BRIEF DESCRIPTION:
Whether it is collecting plastic, paper, and aluminum cans or building your own compost pile, recycling has become an important part of our day-to-day activities in efforts to conserve and preserve the environment. Farming and farm livestock are crucial elements to the concepts of recycling and composting as this lesson will explain. We can learn a lot about conserving resources by observing animals that demonstrate reducing, reusing, and recycling.

LEVEL:
First Grade

SUBJECT:
Science
Social Studies
Language Arts

SKILLS:
Applying, Comprehending, Concluding, Creating, Interpreting, or Reading Chart(s) and Graph(s), Map(s), or Music, Discussing, Following Directions, Identifying, Interpreting, Listening, Listing, Observing, Reading, Recording, Recognizing Relations, or Reading Chart(s) and Graph(s), Map(s), or Music, Discussing, Following Directions, Identifying, Interpreting, Listening, Listing, Observing, Reading, Recording, Recognizing Relations,

OBJECTIVES: The Student will
• demonstrate/illustrate the concept of a cycle.
• describe how important cycles and recycling are to the environment.
• describe how animals such as the earthworm recycle.

ESTIMATED TEACHING TIME:
four sessions 30 to 45 minutes

SUPPORTING INFORMATION FOR TEACHERS:
One very important aspect of conserving and preserving our environment involves recycling. Over the past few years, recycling has become popular. The most common recyclable materials are clear glass, certain types of plastic, newspaper, and aluminum. Some communities also recycle steel (tinned) cans, cardboard, magazines, many types of plastic, and both brown and green glass. As recycling grows, more and more items will be recyclable.

The method of collecting recyclables also varies from community to community. Some materials are easier to recycle than others. It is important to know what materials can be recycled locally and how to prepare them for recycling.

WHAT IS RECYCLING?
Recycling imitates nature’s cycles by giving new life to materials that might otherwise be disposed of as trash. Recycling means to break items down, reprocess them and return them to a new use. Many things that are thrown away can be recycled.

Recycling benefits all of us by reducing the amount of garbage or solid wastes, conserving energy and other resources, creating jobs, and reducing pollution.

The symbol for recycling is a series of arrows that forms a continuous loop. This loop represents the cycle that takes place when materials are recycled.

COMPOSTING:
Some wastes such as food and yard trash can be composted, allowed to decompose and turn into mulch or humus that can enrich the soil. Composting is a natural form of recycling. Composting breaks down yard wastes, reprocesses these wastes into mulch, and the material can then be returned to the soil.

Composting is a fairly modern practice that speeds up and intensifies the very natural process of decomposition. Decomposition has been happening, unaided by people, since the world began. Through decomposition, things made of organic matter are broken down through a chemical process into simpler compounds and elements. Composting spurs some of nature’s recyclers into action and hurries the decomposition process.

Microorganisms are too small for the human eye to see. Bacteria and fungi are microorganisms. They digest garbage like food scraps, industrial waste, leaves and grass clippings. They release 99 percent of all the carbon dioxide necessary for plant growth.
Macroorganisms also contribute to decompositions. Earthworms, mites, grubs, and insects are macroorganisms that dig, chew, digest, and mix materials. When they chew a leaf, for example, they increase the surface area so that bacteria and fungi can finish the decomposition process.

ANIMALS THAT RECYCLE INCLUDE ...

Earthworms and cattle are examples of animals that recycle resources efficiently. Earthworms, for example, are crucial to the decomposition process, because they help to return to the soil those nutrients necessary for new plant growth.

Earthworms eat almost anything soft enough to chew. They also eat bacteria, which are very nutritious -- 60 percent protein and no fat. As organic matter passes through the earthworm's body, it is ground up by tiny stones in the gizzard, and leaves the body as waste in the form of dark, fertile castings which contain partially digested material that enriches the soil. Each day an earthworm produces its weight in castings. That's a lot of recycling!

When microorganisms and macroorganisms decay, their decomposing bodies add nitrogen and other elements to the soil. Decomposed refuse, or compost, enriches soil. It returns to the soil nutrients necessary for new plant growth. If it weren't for the work of microorganisms and macroorganism, our earth would be one major garbage dump with no chance of survival. These tiny creatures model recycling by turning garbage into nutrients to enrich the soil.

We can learn a lot about conserving resources by observing animals that demonstrate reducing, reusing, and recycling. Farming and Farm livestock are crucial elements to the concepts of recycling and composting. Almost half of the land in the continental United States is classified as grazing land. At least 90 percent of that land, according to the National Cattleman's Beef Association, cannot be used for farming or growing crops because it is too high, too rough, too dry or too wet. Grass from these land contains cellulose which is indigestible by humans. Because they are ruminants, cattle can eat grasses and convert them to beef and dairy products that humans can eat.

As ruminants, cattle turn grass and other forages into high-quality food for humans, making use of vast resources that would otherwise go unused for food production. They also efficiently utilize otherwise unusable by-products from human food processing and play a key role as "energy converters and nutrition reservoirs" in food systems worldwide.

Cattle producers are responsible for managing cattle and land in ways that will protect the environment. This is in the producers’ best interests, since caring for the land will allow the land to care for the cattle on which they depend.

About 85 percent of nutrients consumed by cattle come from sources not suitable as food for humans. Many beef cattle go from grazing lands to feedlots. There they are fed roughage and cattle feed concentrates (mostly grains only suitable for animal feed) for about 100 days. Feedlots help to keep supplies of beef constant, making beef available year-round and keeping prices stable.

Cattle producers also use their animals as recyclers by feeding them food processing by-products that would otherwise be shipped to landfills. More than half of by-products of fruit, vegetable, and grain processing goes into livestock food. Cattle eat such things as almond hulls, barley or hops hulls, canola seed pulp, cereal by-products, citrus pulp, corn and other grains, corn gluten (a by-product of corn processing), corn stalks, cotton seed husks, culled vegetables, dried or wet tomato pulp, grasses, molasses, potato peels, soy hulls, sugar beet pulp, shrubs, weeds, wheat middleings (a by-product of wheat processing.)

Food from cattle provide high-quality protein, calcium, and vitamins such as iron, zinc, and B-vitamins that humans need to maintain a healthy diet. Equally important are the other products from cattle that humans use everyday. Products from cattle include such things as butter, cheese, hamburgers, hot dogs, ice cream, milk, roast beef, steaks, cosmetics, glue, leather for shoes, gloves, and coats, medicines, soap, pet foods, and fertilizers.

ACTIVITY 1: “WHAT IS A CYCLE?"
Getting Started:
• Write the word “cycle” on the board.
Procedure:
• Ask students what they think “cycle” means. Develop a definition on the board.
• Explain to students that there are many cycles around us. Ask students if they can think of any cycles. Some examples include days of the week, months of the year, and seasons. Show these examples on the board.

• Explain that cycles are very important to our everyday lives. Divide the class into small groups of three to five students and ask them to discuss and draw a cycle of their typical school day. Discuss what would happen if every day were completely different, that is without repeating a pattern. Explain to them that without a past or past experiences to build on, you would not know what to expect.

• Write the word “recycle” on the board. Ask students what they think the term means. Recycle means to make into something to use again. Develop your own definition on the board. Explain that many cycles depend on people to make them happen. To recycle something means to give the object a new beginning by changing it into something that can be used again.

• Explain that paper cannot be planted to make a new tree, but it can be recycled to make new paper and paper products. Trees are an important aspect of Tennessee agriculture. In 1998, Tennessee’s forest resources produced sawlogs to manufacture approximately 951 million board feet of hardwood products and approximately 155 million board feet of softwood lumber. This level of production continues to place Tennessee near the top among hardwood lumber producing states. In addition to sawlog production, Tennessee produced over 970,000 cords of hardwood pulpwood and approximately 728,000 cords of softwood pulpwood. The 1989 forest survey indicates that almost 50 percent of the total land area in Tennessee is forested. This is about 13.3 million acres. Farmers own 3.85 million acres which is second only to individual ownership which accounts for 5.58 million acres. The ten leading Tennessee counties in timber volume, as of 1998, were as follows: Scott, Cumberland, Morgan, Fentress, Campbell, Hickman, Wayne, Polk, Hardeman, and Overton. The ten leading counties in lumber production, as of 1998, were as follows: Hardeman, Macon, White, McNairy, Henry, Johnson, Overton, Montgomery, Dickson, and Franklin.

• Explain to students that cycles are a part of life. A cycle is a series of events that can last for thousands of years. A cycle may go through changes, yet change eventually arrives back to where the cycle began.

ACTIVITY 2: “MY SCHOOL DAY CYCLE”
Getting Started:
• Make a copy of the “My School Day Cycle” activity sheet for each student.

Procedure:
• Distribute a copy of the “My School Day Cycle” activity sheet to each student and have them complete the page.

Option 1: Using the blank copies provided, have the students complete different kinds of cycles.

ACTIVITY 3: “COMPOST PILE CAKE”
Procedure:
• Ask the students, “What happens to fruits and vegetables if you let them sit on a counter or in the refrigerator for too long?” (They rot.)

• Ask the students, “Is this a good thing?” (Many will say no.)

• Explain that of course if you wanted to eat that fruit or vegetable it is not good, but ask the students, “What would happen if nothing decomposed? (It would be horrid; there would be dead plants and animals all over the place.) So, decomposition is necessary and part of a cycle.

• Explain to students that a compost pile is a structure used by people to speed up the decomposition of food and plant scraps and return them to the soil as humus. Explain that you will mimic how a compost pile is structured by creating a fun compost pile.

Animals... page 60
Ingredients:
- 3 1/2 c. Milk
- 1/2 c. Margarine
- 12 oz. Prepared Whipped Cream Topping
- 8 oz. Cream Cheese
- 1 c. Powdered Sugar
- 1-20 oz. pkg. of Oreos (crushed)
- 2-3.4 oz. pkgs. of Vanilla Instant Pudding
- 6 Gummy Worms
- 1 c. Chopped Nuts
- 1 c. Maraschino Cherries
- 1 c. Coconut (add two drops of food coloring)

Directions:
- In a large bowl mix margarine and cream cheese until soft, add powdered sugar (to taste) and mix well.
- In another large bowl, add milk, pudding mix, and whipped cream, mix well.
- Combine the ingredients in the two bowls and mix well.
- In a large, clear container (salad bowl or punch bowl), place Gummy Worms along the sides of the bowl.
- Then alternate layers of crushed cookies (reserve about one cup), pudding mixture, nuts, coconut, and cherries. Finish with a layer of cookies on top.
- Note: For effect, serve the Compost Cake to the class using a garden spade or small shovel (well washed, of course).

Activity 4 — Construction a Mini-Compost Bin

Steps:
- Cut the top from a clean, clear plastic gallon jug.
- Poke holes for drainage in bottom of jug. Make sure you have a dish to put under the jug to collect excess water.
- Add one-inch of gravel drainage.
- Poke holes in a plastic lid and place over gravel.
- Create a bedding mixture of peat moss, grass clippings, vacuum cleaner bag debris, dryer lint, etc... and put on top of the lid.
- Add a few earthworms.
- Chop food scraps and sprinkle on top.

- Cover with more bedding material.
- Sprinkle with water. Don't soak!
- Stir and observe daily. Record what you see in a daily log. Sprinkle with water as needed.

Extension Activities:
- Challenge students to see how long they can keep using (and reusing) one reusable object such as a piece of paper or a plastic bag. Results could be graphed on the board.

Making Paper

Materials you will need:
- Scraps of paper ... newspaper, construction paper, etc...
- Piece of mesh wire.
- Blender (After using the blender for this activity, do not put food back into it.)
- Sponge
- Container
- Water

Steps:
- Tear up scraps of paper and place into the bottom of the blender.
- Add water and blend until all of the pieces are no bigger that the end of your “pinky” finger.
- Place the piece of mesh wire over the container (bowl, coffee can, etc...) and pour the mixture over the wire. The water should flow through to the container while the paper mixture stays on top of the mesh wire.
- Using a damp sponge, gently press out the paper mixture until it is flat, like a sheet of paper, and most of the water has been removed.
- Flip the wire mesh upside down to release the paper into the palm of your hand and place on a dry sheet of newspaper.

Option 1: Experiment with different colors mixed together.

Option 2: Use cookie cutters to make paper into specific shapes.
RESOURCES:


MY ___________ CYCLE
MY _______________ CYCLE
Agriculture is the production of food and fiber through growing crops and raising animals. It is the largest industry in our nation and in the state of Tennessee. There are over 250 career areas available and 22 million people working in agriculture ... in the United States alone. As a matter of fact, one out of every five people are employed in some facet of agriculture. Can you live without agriculture? Absolutely not! Agriculture is more than just the food that we eat and the clothes that we wear. It's everywhere.

Not only is agriculture the largest industry in the United States, but is getting bigger all the time. As the population grows, the agricultural industry increases to meet the demands for foods and fibers. At the same time, the introduction of new products and methods adds to the industry’s diversity.

While you don’t have to come from a farm to pursue a career in agriculture, it is important to know something about it. This is why the Tennessee Foundation for Agriculture in the Classroom was formed... so that students will have a better understanding and appreciation of their food and fiber system. As 1 out of every 5 students will some day work in agriculture, this lesson will hopefully provide ideas as to the types of jobs that are out there. There are ag-related jobs everywhere for anyone!

Today’s farms have become highly specialized and highly technological. Farms engage some of the newest technological advances available. Computers are found not only in farm offices but also on combines that harvest grains, in milking parlors, and are even connected to cattle to control access to feed and grain. Farmers use satellites and Global Positioning Systems (GPS) to determine fertilizer rates in crop fields, identify insect pest infestations, and locate disease outbreaks in crop fields.

With all of this technology, farmers must be well educated and versatile in their abilities and willing to continually learn new information and technology. Most farmers have at least two years of college and many have bachelor’s degrees. They are far from the stereotype that most have of the slow talking, dim-witted, country bumpkin. Machinery led this revolution on today’s farms beginning with the industrial revolution. Today’s technology is also informational and biological as well. Biological technologies will enable U.S. farmers to help feed the world as the population continues to grow.
Technology is also important in the total food system. The days of people growing, preparing, and preserving all of their own food are, for the most part, long gone. Most consumers rely heavily on our extensive food system to transform raw products into ready-to-eat foods. This lesson provides students with the opportunity to trace wheat from planted seed, to crop in the field, through harvesting, to flour, and on to bread.

ACTIVITY 1: A FARMER WEARS MANY HATS
Getting Started:
• Make copies of “What Kind of Farm” and “A Farmer Wears Many Hats,” pages, one per student.

Procedure:
• Ask the students, “What do farmers do?” Write their ideas on the board.

• Depending on their answers, it is quite likely that they have stereotypical impressions of the traditional diverse farm and not the modern farm.

• Explain that today’s farms have become very specialized. People who farm are well educated, smart, and run their farms as businesses. They usually concentrate in one or two areas. If they raise livestock they usually grow the crops to feed that livestock and only raise one type of animal.

• Select one or more of the books listed in the Resource section that tells the story of today’s farms read it to the class.

• Distribute copies of “What Kind of Farm.”

• Work with the students to complete the student activity page by decoding words and connecting them to the pictures. Explain that vegetable farms are called truck farms because they truck the produce away.

• Look back at the list of jobs that the students identified as being done by farmers. Line these jobs up with the type of farm.

• Select one or more of the books listed in the Resource section that describe how food is produced and the work that farmers do and read it to the class.

• Now distribute the student activity page “A Farmer Wears Many Hats.” Read the descriptions of the jobs that farmers do and have the students select the right hat.

• Ask students if farmers are boys or girls (men or women). Explain that almost ten percent of the farms in the U.S. are run by women alone, and that women and men farm together on most farms today.

ACTIVITY 2: From Farm to You
Getting Started:
• Make copies of the student activity page “From Farm to You” one per student.

Procedure:
• Ask the students, “Who produces food?” (farmers)

• Ask the students, “How does food get from the farm to you?”

• Select one or more of the books listed in the Resource section that tells the story of food from farm to table and read it to the class.

• Discuss that raw commodities are sold by farmers to wholesalers (foods that are sold raw) or food processors (foods that are sold in a processed form). It is trucked to their warehouses or processing plants. They process raw commodities into processed food and package it. It is trucked to their warehouses and then to retail stores or restaurants. It is sold to consumers from retail stores or restaurants.

• Distribute copies of the “From Farm to You” student activity page.

• Have students cut apart the illustrations and sequence them in order then paste them in place to tell the story of food from farm to consumer. (sacks of seed on a pallet, preparing the soil and planting the seed, ripe wheat, harvesting the wheat with a combine, storing the grain in grain bins, grinding the wheat into flour, baking the flour into bread, boxing the bread, trucking the bread to a store)

• Identify that there is only one truck in the picture but that products are often trucked more than once, where did they place the truck and where else could it be placed. (Goods are trucked from Careers ... page 2
field to grain bin, from grain bin to mill, from mill to bakery, from bakery to warehouse or store or restaurant.)

- After the students successfully complete the sequencing, ask the students to answer these questions at each step of the way (sacks of seed on a pallet, preparing the soil and planting the seed, ripe wheat, harvesting the wheat with a combine, storing the grain in grain bins, grinding the wheat into flour, baking the flour into bread, boxing the bread, trucking the bread to a store):
  - “Who designed this product, equipment, plant?”
  - “How was this product made and who made it?”
  - “Was this product promoted or advertised? Who promoted it?”
  - “Was this product sold? Who sold it? Who was it sold to?”
  - “Who kept track of all of this business?”
  - “Where did this (these) businesses get the money to start their business, expand their business or keep running when the economy was slow?”

- Examining each step of the process will lead students to understand that the food system is complex and that while only two percent of the population is farming, almost 20 percent of the population is employed in the total food and fiber system.

EVALUATION:
- Have the students list and describe specialized farms.
- Have the students describe three jobs that farmers do.

- Give students a commodity and have them trace the path from farm to consumer in pictures or with one word sequencing. (Dairy Farm — to — Milk Truck — to — Ice Cream Plant — to — Truck — to — Warehouse — to — Grocery Store — to — Home.)

EXTENSIONS AND VARIATIONS:
- Agricultural Charades: Using the “hats” included in the activity page, have students take turns acting out the career. The other students can try to guess what career is being portrayed.

- Utilize your “Farm Friends” volunteer directory or contact your county Farm Bureau office to invite someone who works in agriculture to visit your class.

- Take a field trip to an ag-related business, such as the grocery store. How many agriculturally-related jobs are involved in getting our food from the field to the grocery store shelves?

RESOURCES:


Paulsen, Gary. The Tortilla Factory. Careers ... page 4


**THE MANY HATS OF AGRICULTURE**

**DIRECTIONS:** There are many, many jobs related to agriculture. Below are just a few of them. Read the job descriptions listed below. Then draw a line from the job to the hat that matches it.

---

**Forestry Ranger**
I am a forestry ranger. I know a lot about trees. I work to prevent forest fires. I also help clear trees from the land and work to prevent soil erosion.

**Veterinarian**
I am a veterinarian. I take care of animals, especially when they get sick. I work with farmers to keep their cows, pigs, chickens and other animals healthy.

**Weather Forecaster**
I am a weather forecaster or meteorologist. I understand weather patterns and climate. I watch for weather changes and tell farmers so that they can prepare for them.

**Baker**
I am a baker. I use flour, sugar, milk, and other agriculture products to make cakes, donuts, cookies, and other delicious pastries for you to eat.

**Mechanic**
I am a mechanic. I know how to operate different types of machinery. I help farmers make repairs and keep farm machines, such as tractors, in good working order.
WHAT KIND OF FARM IS IT?

- Truck Farm
- Dairy Farm
- Horse Farm
- Swine Farm
- Crop Farm
- Tree Farm
- Fruit Farm

Hogs
Horses
Vegetables
Peaches and Cherries
Dairy Cattle
Lumber
Corn

Name: ____________________
Cut out these pictures and put them in order to trace the path of wheat from farm to you.
A farmer has to be a soil scientist. He or she has to take care of the soil and water so that they can grow food for us to eat.

A farmer must be a good mechanic. He or she needs to be able to operate tractors and combines. They need to know how to keep them working and fix them if they break down.

A farmer must be a good weather forecaster. He or she needs to know when it will rain or snow so that they can care for their animals and plant their crops at the right time.

A farmer must be a good banker. He or she must be able to pay bills, pay workers, sell their products, and manage money for their family.

A farmer must be a good veterinarian. He or she must be able to know when their animals are sick and give them medicine to make them better.

A farmer has to be a good engineer. He or she must know how to build barns, fences, and other buildings.
<table>
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<tr>
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<tr>
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horticultural supplies worker
horticultural therapist
hydrologist
ichthyologist
industrial agriculturist
information specialist
inspector
international agriculture specialist
insurance broker
irrigation engineer
irrigation manager
laboratory technician
land appraiser
land economist
land surveyor
land utilization specialist
landscape architect
life scientist
market analyst
market researchers
meatcutters
meat department manager
meat grader
meat inspector
microbiologist
microscopist
molecular biologist
mycologist
naturalist
nematologist
nurseryman
nursery owner/operator
nutritionist
organizational fieldman
ornamental plant specialist
ornithologist
outdoor recreation specialist
packaginghouse manager
parasitologist
park manager
park naturalist
park ranger
park superintendent
pathologist
peace corp volunteer
peace corp administrator
pest control manager
pesticide residue analyst
pet food processor
plant breeder
plant pathologist
plant physiologist
plant propagator
pest control inspector
poultry quarantine inspector
poutryman
poultry inspector
poultry scientist
produce department manager
produce development specialist
production credit fieldman
public relations manager
purchasing agent
quality control specialist
radio farm director
rancher
range manager
ranch manager
range conservationist
range scientist
range specialist
range
recreation development planner
resource economist
rural sociologist
salesman
sales representative
sanitarian
securities salesman
science editor
seed broker
seed grower
seed technologist
soil analyst
soil chemist
soil fertility scientist
soil physicist
soil conservationist
soil scientist
soil surveyor
statistician
taxonomist
technical writer
technical editor
textile researcher
textile technologist	
timber manager

timber specialist
taxocologist
transportation manager
turf producer
turf specialist
tv farm director
vegetable grower
virologist
vocational agriculture teacher
waterfowl specialist
waterlife management specialist
water economist
water resource administrator
water resource engineer
water resource researcher
water resource specialist
water resource development official
weed science specialist
wildlife administrator
wildlife biologist
wildlife specialist
wildlife writer/editor
zoologist
WHY WATER?

SUPPORTING INFORMATION FOR TEACHERS:

No doubt you are aware of the constant battle of American agriculture versus environmental interest groups. The ag industry is constantly bombarded by exaggerated reports on the evening news regarding water pollution, pesticide contamination, animal welfare, and soil erosion. If you listen closely to the underlying message from media reports, more often than not, it is farmers that are being blamed for the decline of the environment. But what’s the real truth?

The truth is not at all hard to understand. And neither group is perfect. But if you think about it, farmers are some of the very best environmentalists. After all, they have more at stake than anyone else. Who else depends directly on the soil, water, land, and air to make a living? If this is how a farmer makes his or her living, why would he or she destroy these natural resources?

USES AND LIMITS ... One extremely important natural resource to the agricultural industry is water. Farmers need water to give to their livestock and for their crops to grow. And we all, farmers included, need clean water to drink. To be healthy, your body needs about two quarts of water each day. This is about eight glasses. You must have water to live. While you can live without food for a month or more, you would die within a week, most likely, if you had no water. Your body is made up of two-thirds water. One of the activities included in the section entitled “My Thirsty Body” will help students understand just how important water is to their bodies.

Even though there is an abundance of water on Earth, much of it is unusable for consumption by people or animals in its present form. More than 97% of Earth’s water is salt water. Of the freshwater supply, which is less than 3 percent of the total amount of water on Earth, most is unconsumable as well.

Earth's Total Water Supply
Salt water -- 97.2%
Fresh water -- 2.8%

100.0%
Total water on Earth

Earth's Total Freshwater Supply
Ices, glaciers -- 2.38%
Ground water (available) -- 0.397%
Surface water (available) -- 0.022%
Air and Soil -- 0.001%

2.8%
Total Fresh Water On Earth

BRIEF DESCRIPTION:
Water is a limited and essential natural resource. Plants need it, animals need it and so do humans. In this lesson, students will explore that foods contain water, that all living things need water and that we obtain water from many varied sources. They will also describe one way that clean water can be conserved.

SUBJECTS:
Science
Social Studies
Language Arts
Mathematics
Visual Arts

SKILLS:
Analyzing, Applying, Collecting Data, Comparing Similarities and Differences, Comprehending, Concluding, Demonstrating, Developing Self-Understanding, Discussing, Drawing, Estimating, Experimenting and Testing Hypotheses, Following Directions, Listening, Listing, Measuring, Observing, Predicting, Reading, Recording, Recognizing Relations, Taking Responsibility, Role Playing, Understanding Cause and Effect, Writing

OBJECTIVES:
In this lesson, the students will:
• describe that the human body, animals and plants need water every day.
• list foods that are high in water content that provide some of the human bodies daily water needs.
• explain why it is important to have high-quality water available.
• describe actions that can be taken to improve the availability of high-quality water.

ESTIMATED TEACHING TIME:
Two 45 to 60 minute sessions

Environment... page 1
Glaciers and icecaps hold more than 2 percent of the Earth’s water. Less than 0.5 percent of the Earth’s water is fresh water available in lakes, groundwater, and streams. People face serious challenges when a limited resource such as fresh water has many demands for its use.

**WATER ... A RENEWABLE RESOURCE**

Water is a renewable resource. Renewable resources are those dependent on sun, air, water, and soil to regenerate. Nonrenewable resources are those which are available only in finite amounts, such as oil, gas, and metals. Through the hydrologic (water) cycle, water is naturally recycled. Most of us are so accustomed to having an unlimited supply of water any time we need it that we rarely think about running out of water. Like any natural resource, our water resources need to be protected to have good, quality water for present and future generations. As our population on Earth continues to grow, we place an enormous strain on all of our resources, including the renewable ones.

The more individuals of one species living in a given area, the greater the impact on natural resources within that area. Conservation is an important tool in reducing this impact and protecting the natural resources.

Whether we live in an urban, suburban, or rural area, we can all be more aware of how we use water within our homes, schools, and community. No one needs to stop taking showers or washing dishes and clothes, but we can all help stretch our water resources by conserving water and using it more wisely.

One of the ways to conserve water is to keep it clean. While government regulations set standards for good water quality, we must all do our part. “Fish Bowl Follies” is an activity that shows what might happen to our water supply if too much pollution occurs. From this activity, students will learn about the various types of common pollutants and ways in which they are being controlled.

**ACTIVITY 1: “MY THIRSTY BODY”**

**Getting Started:**

To do this activity, you will need the following materials:

- Water pitcher filled with two quarts of water
- Tomato
- Slice of Bread
- Knife
- Have students pay special attention to what they ate for lunch that day.

**Procedure:**

- To begin, place two quarts of water in a pitcher on your desk. Explain that this is approximately the amount of water each of our bodies need every day.
- Have the students identify some very visible uses of water in your body, such as saliva, tears, sweat, and urine.
- Discuss the job of water in the body: saliva (aids in digestion), tears (cleans eyes), sweat and urine (rids the body of waste).
- Besides just drinking water, how else does our body get it? Some of the water our body needs is found in the food we eat each day.
- Compare a tomato and a piece of bread. Which has the most water? How do you know? Cut open a tomato and tear apart the bread. Pass them around to the students.
- Make a list using the Wet Foods worksheet.
- Ask your students to identify which food item contained the most visible amount of water?
- Do this every day for a week.
- Again evaluate your food list at the end of the week to determine which food item contained the most visible amount of water?

**EVALUATION:**

- Have the students name some other foods they think might contain a lot of water.
- Why is water so important to us?
ACTIVITY 2: “WATER WORD WEB”
Getting Started:
• Review or introduce your students to story webs.

Procedure:
• Using the Water Word Web activity page, have your students identify ways that they use water everyday (i.e. bathing, brushing teeth, flushing toilet, watering the dog, washing dishes and clothes, etc...) using a word web.

• On the board, list all the ways your students use water everyday (most will be duplicates).

• Discuss ways that they can help to conserve water while doing these water-using activities. Such as turning the water off as they brush their teeth, etc...

• Ask the students, “How do plants and animals use water?”

• Demonstrate how important water is to plants by setting up a demonstration.
  Water a healthy plant in front of the class. Give it time to absorb the water (2-3 hrs.). Pour any excess water off the plant’s saucer.
  Weigh the plant, pot and soil.
  Record the weight.
  Place the plant in sunlight and wait 24 hours.
  Have the students predict what will happen.
  Weigh the plant, pot, and soil it contains again.
  Ask the students, “What happened? Where did the water go?” (The water evaporated from the soil and transpired from the plant.)
  Repeat the process again, and again until the plant begins to wilt.
  Ask the students, “What will happen if we do not water the plant?”

• A Fish (made from a plastic meat tray or any other waterproof item; a pattern has been included for your convenience on page 7.)

• Flashlight

• Eight empty film canisters with tops or any small container that will hold 1/4 cup of each of the following ingredients:
  • Soil
  • Sand
  • Liquid dishwashing detergent
  • Chocolate syrup
  • Salt
  • Paper confetti
  • Powdered detergent/hot water
  • Red food coloring

Procedure:
• Put the fish on a stick or tape it to the front of your bowl.

• Fill the bowl with water.

• To see the effects of pollution, shine a flashlight behind the bowl. Remove a cup full of the clear water from your bowl to show students the clean water in the beginning and the dirty water at the end of the activity.

• Read the narrative. Ask individual students to add the ingredients as indicated throughout the narrative to represent pollution.

• Ask the students” Would you want to swim in a river like the one in our story?”

• Go back through the story. Discuss with your students some ways that you can help solve some of these problems by incorporating conservation methods. Specifically, how can soil erosion be prevented? (Planting trees and grasses, wind rows, contour farming etc.) What are some ways farmers are using less fertilizer? (Crop rotation, etc.) How can we prevent pollution at home? (Follow the directions and use only recommended amounts of fertilizers and pesticides, etc.) What can be done to prevent the care from leaking oil? What can be done to prevent the car from leaking oil? What can be done to prevent pollution at parks?
• Explain that farmers work hard to prevent soil erosion and keep water clean because they rely on these resources for their crops (plants) and animals.

EXTENSION AND VARIATIONS:
• Art: Reinforce the pollution control ideas discussed above using the art activity page on page 8.

• Using your “Farm Friends” Volunteer Directory invite a farmer to your class to discuss ways in which he or she incorporates pollution/conservation control methods into their farming operation. Why are good conservation practices important to him or her?

• Science: Using an apple, carve two eyes, a nose, and a mouth on it. Using a beam balance, weigh the apple and place it on a sheet of paper in a cool, dry spot in the classroom. Write the apple’s weight on the paper. At the end of the week, weigh the apple again. Discuss what happened to the apple. Has the apple gained or lost weight? Why? Where did the weight go? What has happened to the apple’s appearance? Ask the students what might happen to the apple after another week. Let the apple sit another week and have the class check their hypothesis by repeating the observations.

• Art and Math: Make a picture to represent how important water is to your body. Have the students work in pairs. Give each student a piece of butcher paper. Have them take turns lying on the paper. Draw each other’s outline on the paper. As the students finish, help them to measure the length of the outline (the height of the student) and estimate two-thirds. Mark this with a wavy line and explain that this is the amount of water in each body. Give the butcher paper back to each student to color. Draw a face on the outline and color the water part in blue. Be sure to point out that we are representing the amount of water throughout our bodies. It is not all found in just the lowest part of the body.

EVALUATION
• Have the students list and describe how humans need and use water.

• Have the students list and describe how animals and plants need and use water.

• Have the students list and describe where water comes from, including foods that contain a lot of water.

• Assess the accuracy of the students completing the student activity pages.

• On one side of a piece of paper, have the students draw how water gets polluted. On the flip side, have the students draw several ways that we can keep water clean.

• Use the MY POLLUTION SOLUTION as an evaluation tool.

RESOURCES:
Action for a Cleaner Tomorrow. South Carolina Department of Health and Environment.


National Association of Conservation Districts (NACD). P.O. Box 885, League City, TX 77574. 1-800-825-5547.


### WET FOODS

Directions: Each day, write down the foods that you ate for lunch under the appropriate column. Then circle the one food that contained the most water with a red crayon.

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Imagine a river as it meanders through the countryside, past the farmer's fields, widening into a lake, but narrowing again as it passes through the city. In this river, named ____ lives a fish. His name is Franky. (Point to the fish in the clear water in the fishbowl. Then ask your students, "How does it feel to be Franky?" This question should be asked repeatedly throughout the story and should generate an enthusiastic response from your students. Let students respond aloud.)

Franky Fish swims down river past an eroding bank. An eroding bank is where soil sometimes washes into the river. When it rains, what will happen to the bank? What if it rains a great deal? (Have a student pour soil from the container into the water. Then ask "How does it feel to be Franky?")

Suppose part of the soil eroding into the water came from farmland. The farmer has just put fertilizer on the field. But instead of staying on the field to help the crops grow, some of the fertilizer may be washed away with the eroding soil and go into the river. (Add sand to simulate fertilizer.) What effect will the fertilizer have on the plants in the river? (It will make plants grow.) If the plants grow too abundantly and too fast, the river can't continue to support them. They die, fall to the bottom of the river and start to decompose.

Decomposing things use oxygen. What else in the river needs oxygen? (Franky Fish. Now ask your students, "How does it feel to be Franky?")

Where the river has widened into a lake, several families have built their homes. Perhaps their septic tanks drain into the water or some of the fertilizers they've put on their lawn have washed into the water. (Put liquid dishwashing detergent into the fishbowl. Then ask your students, "How does it feel to be Franky?")

As the lake narrows back into a river, our fish continues downstream past the city. Even though the city people don't pollute the water directly, what they do at their own homes or subdivisions can affect the quality of the river's water. Have you ever seen a car leaking oil? Where does the rain wash this oil? (Put chocolate syrup, representing oil, into the fish bowl. Then ask your students, "How does it feel to be Franky?")

In the winter, when it gets icy and snows, what do we put on our roads to make it easier to drive? (Salt or sand. Put salt into the water.) When you eat or drink something salty, what do you do? (You get something to drink.) Can this fish get fresh water to drink? (No. Ask your students, "How does it feel to be Franky?")

Suppose the city has a park next to the river. People litter the park and some of it blows into the water. (Put pieces of paper into the fish bowl. Then ask, "How does it feel to be Franky?")

As the river leaves the city, there are several factories that are located along it. Although regulations are strict, if the factory's control equipment is not working properly, some chemicals or heated water may flow into the river. (Put powdered detergent and hot water into the fish bowl and stir for effect. Then ask your students, "How does it feel to be Franky?")

The waste water treatment plant for the city is also located along this section of the river. The plant does its best to clean out impurities, but some polluted water gets into the river. The river has a large volume of water flowing through, and the plant only puts a small amount of pollution into it. It shouldn't cause too much of a problem, right? It would be like putting two drops of this food coloring into this jar of water. (Put in food coloring and stir. Ask your students, "How does it feel to be Franky?" Hold up the cup of clear water you set aside at the very beginning of this story and ask, "Where do you think our fish would rather live?") How can we better prevent water pollution?
Directions: Below are two different fish patterns that may be enlarged, reduced and duplicated to use in "Franky Fish and the Fish Bowl Foozle". Remember to cut your fish from a waterproof material before placing it inside the fishbowl.
Name: __________________________

My Pollution Solution

Directions: Read the sentence under each box. Draw a picture that goes with the sentence showing how pollution can be prevented.

This is how I can prevent pollution at home.

This is how I can prevent pollution at school or at the park.

This is one way farmers prevent soil erosion.

This is how I can conserve water everyday.
Soybeans are produced for human food, consumer and industrial products, and livestock feed. Soybeans are one of the nation’s most fascinating and versatile edible plants.

THE HISTORY OF THE SOYBEAN...

The first written record of soybean cultivation appears in the writings of the Chinese Emperor Sheng-Nung in 2853 B.C. This emperor, who was known as “The Father of Chinese Agriculture” named the soybean as one of the five sacred plants. The other four sacred plants included rice, wheat, barley, and millet. By the first century A.D., soybeans were being cultivated in Japan as well as in China.

Medical records from Ancient China, Egypt, and Mesopotamia, dating back as far as 1500 B.C. show that the soybean was not only eaten for nutrition, but was also commonly used as medicine. In these ancient cultures, moldy and fermented substances extracted from soybean curd were used as antibiotics to treat wounds and reduce swelling. In Manchuria, soybean oil was used as a repellent to deter insects that preyed on silk-worms. Doctors in Moscow have prescribed soybeans as a cure for rickets. Chinese physicians had a high regard for the soybean’s restorative powers. They used the beans as a remedy for ailments of the heart, liver, stomach, lungs, kidneys, bladder, bowels, and nerves. Soybeans were also recommended for improving the complexion and stimulating hair growth.

A German botanist named Engelbert Kaempfer introduced soybeans to the European continent in the early 1700’s. In 1721, he published a recipe for soy sauce, which is the first written account of the soybean in European literature. And most likely, it was the first time that Europeans became aware that the soybean was edible.

In the mid-1700’s, the famed Swedish botanist Carl von Linne, “The Father of Modern Systematic Botany” and founder of the modern system of scientific nomenclature, gave the soybean its scientific name, Glycine (The Greek word for “sweet”) Max (designated because of the large nodules on the soybean plant). Despite experimental efforts, the climate and soil conditions of Europe were not conducive to soybean production and therefore it was not cultivated commercially as a crop.

Even though soybeans have been a major food crop in China for over 5000 years, soybeans were not grown in our country until the late 1800’s.
The first soybeans arrived in America in the early 1800’s on trading ships returning from China. They were used as inexpensive ballast to enhance stability of the ship and were usually tossed overboard upon arrival. In 1804, the soybean made its first appearance in American literature by James Mease who suggested that American climate was conducive to producing such a crop and the bean “ought therefore to be cultivated”. Apparently no one took this advice seriously as there is no further written mention of the soybean until 1829, when it was listed in an exhibition in the Botany Garden at Cambridge, Massachusetts. At that point the soybean was deemed an interesting, but not particularly useful, horticultural oddity.

Finally in 1879, scientists began studying the soybean as a potential food source. They discovered the potential soybeans had as a “forage plant” for livestock. By 1898, the USDA was encouraging farmers to grow soybeans for animal feed.

At first soybeans were small, and their uses few, until a scientist named George Washington Carver began to find more and more use for them. By 1904, he had developed over 300 useful by-products of soybeans.

The popularity of soybeans continued to grow as more varieties were discovered. William Morse, “The Father of Soybeans in America,” recognized the potential of the soybean and proclaimed “there can be little doubt that the soybean is destined to become one of the major American crops.” While working for the USDA, he formulated a plan for America to become the world’s leading producer of soybeans. At the time of his research, only 20 varieties of soybeans were being grown in the U.S. Each variety had different characteristics ... some yield more oil, some grew better in humid climates, some grew more quickly, some required more sunlight, etc... Understanding that expanding the variety of soybeans grown would help America become the world’s leading producer, he set off for the Far East in 1929 to collect soybeans of all sizes, shapes, colors, etc... He returned to America in 1931 with more than 4500 samples of the 2000 varieties of soybeans for researchers to study.

In 1930, Henry Ford, the automobile tycoon, turned his attention from the auto industry to agriculture and in particular soybeans. Ford was convinced that the soybean could become useful to the car industry. So, he set up a farm and planted 300 varieties of soybeans on a 9000 acre tract in Dearborn, Michigan. Then, he encouraged nearby farmers to grow even more soybeans by pledging to buy up whatever they produced. By 1933, he’d spent $1.25 million on soybeans.

Eventually scientists working for Ford figured out how to derive a strong plastic from the soybeans that was subsequently used for gearshift knobs, horn buttons, window frames, accelerator pedals, light switch assemblies, and ignition coil casings in Ford’s automobiles.

In time, the scientists in Ford’s labs fashioned an automobile exterior from soybean plastic. By 1935, Ford was using a full bushel of beans in the manufacture of each car. However, after WWII, petroleum based plastics replaced soybean plastics in the automobile industry. Unfortunately, no major car manufacturer has done much with soybeans since. However, research into many other current industrial application of soybean derivatives is indebted to the discoveries made in the Ford labs.

SOYBEAN BY-PRODUCTS:

From foods to ink, paints to plastics, today soybeans have hundreds of everyday uses. Some of the products made from soybeans include the following:

- cereal
- cooking oil
- chocolate
- hot dogs
- candy
- baby food
- flour
- paint
- soup
- ink
- ice cream
- vitamins
- cookies
- soap
- shampoo
- fabric softener
- diesel fuel
- plastics
- cosmetics
- pet food

Perhaps you are wondering what is so special about by-products derived from soybeans. Let’s look closer at four soybean by-products ...
Sooybean crayons

Soybean crayons are made with soybean oil instead of the traditional petroleum-based paraffin wax. They provide a much brighter and smoother color that doesn’t flake in comparison to regular crayons. Soybean crayons can be found under the Prang Fun Pro™ name at stores. Don’t forget to look at the Teacher Resource Guide to find these crayons also available through the Tennessee Soybean Promotion Board.

Fuel

You have most likely heard of ethanol, a corn by-product used in gasoline production. Biodiesel is another fuel used in diesel engines. It is made from soybean oil and provides similar horsepower, torque, and miles per gallon as petroleum diesel. Unlike petroleum-based fuel, biodiesel fuel is clean-burning, biodegradable, sulfur-free, does not produce explosive vapors and emits a much lower amount of pollutants.

Soy Ink

Made from soybean oil, soy ink is used in over 90 percent of daily newspapers in the U. S. Why? Soy ink prints more paper per pound and offers better color reproduction.

Building Materials

Soy flour and recycled paper are combined to produce a biocomposite building material that is similar to wood, harder than oak, yet lighter than granite.

Tennessee farmers planted 1.25 million acres of soybeans in 1998 and harvested 1.21 million. The top five soybean producing counties in Tennessee are Gibson, Dyer, Obion, Weakley and Lauderdale, respectively. Overall, Tennessee ranks 17th in the nation in soybean production. Iowa, Illinois, Minnesota, Indiana, and Ohio are the top five soybean production states in the United States.

According to the American Farm Bureau Federation, a total of 66.1 million acres of soybeans were produced in the United States in 1999. America produces 46% of the world’s market share of soybeans ... this is more than any other agricultural commodity. As a result, we sell $4.7 billion in soybeans each year. This is second only to feed grains.

ACTIVITY 1: “WHICH CAME FROM A SOYBEAN?”

Getting Started:

• Obtain soybeans in the pod and loose, raw soybeans.

• Assemble sample soy products or containers of soy products that students may be familiar with:

<table>
<thead>
<tr>
<th>Products</th>
<th>By-products</th>
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<tr>
<td>Soymilk</td>
<td>Soy crayons</td>
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<tr>
<td>Infant formula made from</td>
<td>Vitamin E capsules from natural</td>
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<tr>
<td>soy</td>
<td>sources</td>
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<tr>
<td>Tofu</td>
<td>Vitamin E oil from natural sources</td>
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<tr>
<td>Roasted soynuts</td>
<td>Soy ink or a current newspaper</td>
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<tr>
<td>Soybean cooking oil</td>
<td>(it is probably printed with either</td>
</tr>
<tr>
<td>Soyflour</td>
<td>corn oil or soy ink</td>
</tr>
<tr>
<td>Veggie burgers</td>
<td>Latex paint</td>
</tr>
<tr>
<td>Veggie hotdogs</td>
<td>Soap</td>
</tr>
</tbody>
</table>

• Make copies of “WHICH CAME FROM A SOYBEAN,” one per student. Make crayons available.

PROCEDURE:

• Ask the students if they know what soybeans are or look like.

• Show them the raw soybeans in the pod (on the stem if possible) and loose, raw soybeans.

• Ask the students if they know what soybeans are used for.

• Share with students that soybeans are very high in protein, a nutrient that builds muscles, brains, blood and hair. Add that we can eat soybeans but in their raw state they don’t taste very good and contain a chemical that can make humans and animals sick. But, if we roast the soybeans that chemical is gone and we can eat soybean products and feed soybeans to livestock.

• Display the products and/or product packages. Ask the students if they have seen any of those products. Discuss the soy component and why some of the products would be used. (e.g. soy infant formula is essential for babies allergic to their...
mother's milk or cow milk.)

• Explain that food is not all that we get from soybeans. We also get by-products. Display the by-products.

• Distribute the student page “WHICH CAME FROM A SOYBEAN” and have the student complete it following the directions.

ACTIVITY 2: “THE SOYBEAN JOURNEY”

Getting Started:
• Obtain a world map.

• Collect a removable note pad, yarn, a magic marker and stapler or tape.

• Paper for students to construct a timeline.

PROCEDURE:
• As you tell the story of the soybean traveling from China to America trace the path as well.

• Using the removable notes, yarn and the supporting information trace the path of the soybean from China to the U.S.
  1. Write the dates on the removable notes, place these on the country and string the path using the yarn.
  2. The first date should be 2853 BC and this note posted on China.
  3. The string should connect to the note with tape or a staple and be stapled to the next two removable notes with the date 1500 BC, posted on Egypt and Iraq (Mesopotamia).
  4. The fourth notes should be dated 1 AD, which should be posted in Japan and connected to China with a separate yarn.
  5. And so on.

• Have the students develop their own timeline of the soybean as it made its way from China to the United States.

EVALUATION:
• Have the students list some soybean products and by-products.

• Have the students develop an ad for a magazine that promotes a soybean product and includes information about the benefits of that product.

• Assess the accuracy and completeness of the students’ timelines.

EXTENSIONS AND VARIATIONS:
• Utilize your “Farm Friends” directory or contact your county Farm Bureau office to invite a soybean farmer in your county or neighboring county to come speak to your class about growing soybeans. Don’t forget to ask ... he or she may be able to provide samples of soybeans for your classroom.

• Language Arts: the word soybean begins with the letter “S”. How many other words can your students think of that begin with a “S”. How many other food-words begin with the letter “S”? How many other farm words begin with the letter “S”?

RESOURCES:


• Tennessee Department of Agriculture 2002 statistics (August 2002)

• Tennessee Soybean Promotion Board, 199 Carriage House Drive, Jackson, TN 38305 Phone: (731) 668-2850.

• The amazing soybean (1998). Minnesota Soybean Growers Association

• “Where can you find soybeans after it leaves the farmer’s field?” Poster Indiana Farm Bureau women’s Department.
Which came from a soybean?

Directions: Look at each item on the page. Color the ones that came from soybeans. Mark an X on the ones that did not come from soybeans.
SUPPORTING INFORMATION FOR TEACHERS:

Vegetables are an important part of our everyday diets. According to the USDA, we should get three to five servings of vegetables each day.

WHAT IS A VEGETABLE?

Although definitions of vegetables vary, the definition used by horticulturists is that they are foods that grow on herbaceous plants, or plants that have stems that are softer and less fibrous than the woody stems of trees and shrubs. Vegetables are made up of the vegetative part of the plant such as the roots, stems, and leaves of herbaceous plants. Examples of these include, but are not limited, to the following:

- **Roots:**
  - Carrot
  - Turnip (bulb)
  - Radishes

- **Stems:**
  - Celery
  - Asparagus

- **Flowers:**
  - Cauliflower
  - Broccoli

- **Seeds:**
  - Peas
  - Corn

- **Fruit:**
  - Pumpkin
  - Tomato

- **Leaves:**
  - Lettuce
  - Spinach

There are more elaborate definitions and distinctions between fruits and vegetables as related to the common and botanical definitions. For example, many foods we call vegetables are actually fruits. Cucumbers, peppers, tomatoes, corn, beans, peas, and squash are all examples of botanical fruits. But for this lesson, we are going to use the fruit and vegetable differentiation as determined by the USDA’s Food Guide Pyramid.

 VEGETABLES IN DISGUISE:

When we think of vegetables, we often think of raw food products that look like they have just come from the garden. This is not always true. Some foods are processed or changed in some way before they get to your grocer’s shelves. These processed foods start out as raw food items and are cleaned and washed. They may be cut, cooked, crushed, ground, pressed, flaked, chopped, peeled, pitted, dehydrated, canned, frozen, pickled, smoked, salted, bottled, or bagged by the time they get to the grocery store shelves. The important thing to

BRIEF DESCRIPTION:

Vegetables are an important and healthy part of a good, balanced diet. By identifying the parts of vegetables that we eat, students will begin to recognize the important role veggies play in making us strong and healthy.

LEVEL:
First Grade

SUBJECT:
Science
Social Studies
Language Arts
Art
Physical Education

SKILLS:
Applying, Classifying, Communicating, Comprehending, Cooperating, Creating, Following Directions, Identifying, Listening, Listing, Matching, Observing, Reading, and Recognizing Relations.

OBJECTIVES:
The student will:
- identify the parts of the vegetables that we eat.
- review the vegetables by participating in a physical activity.
- describe the importance of vegetables to our bodies.
- review colors

ESTIMATED TEACHING TIME:
One to two class periods.
remember is that all food in the grocery store begins on a farm or ranch. The farmer and rancher are just the first step of the agricultural industry which makes up about 20% of the national workforce. While “farmers’ markets” are becoming more and more common, there are in actuality very few farm products sold directly from the farmer to the consumer. There are more agricultural jobs that link the producer and consumer than many of us realize.

EAT YOUR VEGGIES:

Vegetables are a good source of carbohydrates, fiber and potassium, and vitamins A and C. Carbohydrates are the main source of energy for the red blood cells and the central nervous system. Carbohydrates are found in many vegetables, but are high in starchy vegetables such as potatoes, corn, and peas. Vitamin A helps the body fight infections and gives us healthy skin and eyes. High amounts of vitamin A are found in carrots, squash, and and dark green, leafy vegetables such as spinach. Vitamin C helps the body fight infections and heal wounds and bones. It can be found in broccoli, spinach, and green peppers.

Vegetables are a good source of fiber, which helps the digestive system. Vegetables are also a good source of potassium which helps to regulate blood pressure and helps nutrients pass in to cells.

VEGETABLES AS A AGRICULTURE COMMODITY:

In the United States we export $4.2 billion in processed fruits and vegetables each year. As consumers, we each eat (on average) 186.5 pounds of fresh vegetables.

Tennessee’s top vegetable commodities are tomatoes and snap beans. In 2000, Tennessee’s tomato crop of 4,200 acres was valued at $35 million. Tennessee ranked 6th in the production of snap beans with 9,200 acres harvested with a value of $8.6 million.

ACTIVITY 1: PLANT PARTS YOU EAT
Getting Started:
• Make copies of the “Plant Parts You Eat” worksheet. There should be one copy for each student.

Procedure:
• Review the different plant parts of foods that we eat. Bring different foods to class or arrange a field trip to a grocery store to explore this assignment.

• Distribute a copy of the “Plant Parts You Eat” student sheet to each student.

• Read the directions to the students and have them complete the worksheet.

ACTIVITY 2: VEGGIE TWISTER
Getting Started:
• Use an old bed sheet to create a vegetable twister board. Make a grid on the sheet and have your students draw vegetables on the grid (a sample of the board can be seen in the next column.) The vegetables should have equal representation from the different plant parts (ie. stems, leaves, roots, seeds, etc).

• Then make two spinners out of cardboard and paper clips or metal fasteners. One spinner should be a circle divided into four sections. The four sections should be labeled just like the traditional twister game -- right hand, right foot, left hand, and left foot. The other spinner should be separated into six sections: flowers, seeds, leaves, stems, roots, and fruits.

Procedure:
• Two students will be needed to spin the spinners. One student moves at a time. The combinations are determined by the spinners. For example, if the combination that comes up on the spinner is left hand and leaves, the student must place his/her left hand on a leaf vegetable that we eat such as lettuce or cabbage.

• The process repeats itself and the game continues as the spinners spin for vegetables and maneuver. As
a student falls or places his hand or foot in the wrong place, they are “out”. The last student “plant-ed” on the board is declared the winner.

**ACTIVITY 3: COLORFUL FRUITS AND VEGETABLES**

**Getting Started:**
- Make copies of the “Colorful Fruits and Vegetables” worksheet. There should be one copy for each student.

**Procedure:**
- Distribute a copy of the “Colorful Fruits and Vegetables” worksheet to each student. Read the directions to the students and have them complete the worksheet.
- Share the supporting information concerning what nutrients are provided by vegetables and why we need to eat them.

**EVALUATION:**
- Name some different kinds of vegetables.
- Name some vegetables in which we eat the stems. Name some vegetables in which we eat the leaves, roots, seeds, flowers, and fruits.
- What nutrition value(s) do vegetables have?

**EXTENSIONS AND VARIATIONS:**
- Utilize your “Farm Friends” volunteer directory or contact your county Farm Bureau office to invite a vegetable farmer or gardener in your county or neighboring county to come speak to your class about growing vegetables.
- Grow your own classroom garden. Grant money is available to grow your own garden at school. Go to www.tnfarmbureau.org, and then click on “Agriculture in the Classroom” to download a grant application.
- Math and Art: Using the “Hot Dog Hot Rods” activity from “AITC Alphabet Soup Activities” booklet, bring lots of different fruits and vegetables to class. Have your students, working in teams, construct their own hot rod. Roll out a long sheet of butcher paper. Conduct races to see which hot rod goes the furthest.
- Language Arts and Art: Read “Play with your Food” by Joost Elffers. Bring a variety of fruits and veg-
etables to your class. Let your students create their own “Vegetable Zoo” using the examples in the book or creating their own.

**RESOURCES:**


PLANT PARTS YOU EAT

DIRECTIONS: Draw a line from the food to the plant part it matches.

- lettuce       roots
- cherries      seeds
- carrot        stem
- celery        flower
- peas          leaves
- broccoli      fruit
COLORFUL FRUITS AND VEGETABLES

DIRECTIONS: Read the color words below. Then color the food that color.

FRUITS

- red
- pink
- purple

VEGETABLES

- orange
- green
- brown

Plants... page 11
From the roots to the crown, every part of the tree plays an important role in helping it function properly. There are three main parts of a tree. These parts are the trunk and branches, the leaves, and the roots.

The trunk and branches provide physical support for the tree. The branches are supported by the trunk. The leaves are supported by the branches. The trunk, branches, and roots contain five sections, described below:

**Heartwood** -- This is the woody center of the tree and provides support. It is made up of old xylem that no longer transports water and minerals.

**Xylem or Sapwood** -- This outermost xylem layer carries water and minerals to the leaves from the roots. Old xylem becomes part of the heartwood, or central core, of the tree.

**Cambium** -- A very thin layer of growing tissue - it makes cells that become new xylem, phloem, or cambium. It grows to make the trunk, branches, and roots grow thicker.

**Phloem** -- Known as the inner bark, it carries food or sap (sugar and nutrients dissolved in water) made by the leaves, to the other parts of the tree, including the roots. At certain times of the year, phloem may also transport stored sugars from the roots up to the rest of the tree.

**Bark** -- Composed of hard, dead tissue, the bark protects the living inner parts of the tree. The bark also stretches to let the trunk and branches grow thicker. It is also known as the outer layer or the cork layer. Bark characteristics differ from one tree species to the next and may be spongy, rough, smooth, spiny, thin, thick, paper-like, and peeling.

**Leaves** -- Leaves produce the food for the trees. They capture energy from the sun with a pigment known as chlorophyll and convert carbon dioxide and water into oxygen and sugar, or food through a process called photosynthesis. The gases needed for and generated by photosynthesis enter and exit through tiny holes called stomata on the under surface of the leaves. Water vapor also exits through the stomata in the process of transpiration. Leaf patterns and shapes are unique to different trees and are often used in identification purposes to determine the species of trees.

**Roots** -- A tree’s roots serve two
main purposes. First, the roots provide support by anchoring the broad surface area of the tree in the ground. Second, the roots absorb water and nutrients from the soil. Trees have four kinds of roots - lateral roots, taproots, rootlets, and root hairs.

**Lateral Roots** -- These roots spread out from the tree and cover the area around the tree.

**Taproots** -- In addition to lateral roots, many trees also have a taproot. The taproot grows straight into the ground.

**Rootlets** -- Rootlets are the finer roots that branch from the tree's taproot and lateral roots as they grow away from the tree.

**Root Hairs** -- These attach to the rootlets and absorb approximately 95% of the water and nutrients absorbed by the tree.

**HELPING OUR ENVIRONMENT...**

Trees help our environment in many ways. As windbreaks, trees protect homes and buildings from wind damage and keep wind from blowing away topsoil. The roots and root hairs of trees hold soil in place to keep soil from being washed away during heavy rains. Trees also help to make soil. Leaves from trees add organic matter to the soil while roots break soil and rocks down into smaller and smaller pieces. Forests and other wooded areas provide a sheltered environment for wildlife. In mountainous regions, trees help to prevent snow from sliding down and causing avalanches.

Trees also add water to the air. Not all of the water trees absorb is used to make food for the tree. Most of the water is lost through the transpiration process which puts water back into the air. This added moisture to the air helps to make rain.

**WHAT TREES NEED...**

Just like us, trees need water, soil, air and sunlight to grow and live. They get their nutrients from the soil. The soil also helps to hold their roots in place so that the tree won’t fall over. A tree takes in air through tiny openings in their leaves called stomata. Air, water, and minerals combine and flow into the plant cells to keep a tree alive and growing. Photosynthesis is a food-making process that occurs in the leaves during the warm spring and summer months. Photosynthesis also occurs in conifers year-round. Chlorophyll, a pigment that gives leaves their green color, is found in the cells of leaves. Cells that contain chlorophyll absorb energy from sunlight. Photosynthesis changes water and carbon dioxide from the air into a form of sugar that becomes food for the tree. During photosynthesis, a tree converts carbon dioxide to oxygen to utilize the carbon for making sugar. It releases excess oxygen into the air. A tree also uses carbon dioxide found in the air to convert to oxygen. We use the oxygen to breathe and convert the oxygen to air. We help trees, just like they help us. Sunlight is important for us as well. Although we don’t use photosynthesis to get our food, sunshine helps our body produce vitamin D. Vitamin D is an important nutrient that protects our body from many diseases.

**TENNESSEE’S FORESTRY INDUSTRY...**

Forestry in Tennessee is a $17 billion, 78,000-job forest products industry, according to the Tennessee Department of Agriculture. Of all the states, Tennessee continues to place near the top among those producing hardwood. According to TDA, Tennessee produced approximately 888 million board feet of hardwood and 185 million board feet of softwood in 2001. The 2001 forest survey indicates that 55% of the total land area in Tennessee is forested. This is approximately 14.4 million acres and is an increase over the 1989 survey that showed 13.6 million acres of forest. The increase is due mainly to reversion of farm lands to hardwood forest.

There are 178 tree species native to the state, while several species have been introduced and naturalized. The majority of the state’s trees are hardwoods (78%).

The following is a list of the most common hardwood species (counting all trees > 1’ in diameter):

| 1. Soft Maple | 8. Yellow Poplar |
| 2. White Oak  | 9. Red Oak       |
| 3. Hickory    | 10. Sweet Gum    |
| 5. Red Cedar | 12. Virginia Pine |
| 7. Elm       | 14. Black Cherry |

Plants... page 13
The following is a rank of the most common trees found in the state with a diameter greater than 5\*.

1. White Oak
2. Red Oak
3. Hickory
4. Yellow Poplar
5. Soft Maple
6. Loblolly Pine
7. Virginia Pine
8. Red Cedar
9. Hard Maple
10. Sweet Gum
11. Ash
12. Elm
13. Blackgum/Tupelo
14. Shortleaf Pine

The amount of each forest type has changed little over the last decade. According to TDA, 96% of the forest originates from natural regeneration, while less than 4% is planted.

The wood products industry results in 78,000 jobs with annual wages of $2.3 billion and an annual industrial output of $10.1 billion, according to the University of Tennessee Institute of Agriculture. If you add in supplier industries, the results are an astounding 166,400 jobs with annual wages of $4.4 billion and an economic contribution of $17.1 billion.

The University of Tennessee Institute of Agriculture has classified the major industrial sectors of the forestry industry into the following categories:

- Pulp and Paper (45% of dollars)
- Hardwood Lumber (32% of dollars)
- Furniture (29% of dollars)
- Logging (2% of dollars)

The ten leading Tennessee counties in timber volume production in 2002 were as follows:

1. Cumberland
2. Wayne
3. Morgan
4. Monroe
5. Hickman
6. Scott
7. Campbell
8. Polk
9. Marion
10. Fentress

The ten leading Tennessee counties in lumber production in 2002 were as follows:

1. Hardeman
2. Macon
3. McNairy
4. Johnson
5. Henry
6. White
7. Wayne
8. Franklin
9. Hardin
10. Putnam

Lumber is used in two different forest industries. Primary industries buy roundwood such as logs, pulpwood, etc... and break it down into lumber, chips, handle blanks, etc... Secondary industries are those firms which use a product from a primary industry and further manufacture it into a more finished product such as floors, furniture, etc.

All in all, Tennessee ranks first in production of hardwood flooring and pencils and second overall in hardwood lumber production. Wood is among Tennessee’s five top agricultural crops according to the 2002 U. S. Census Bureau. Despite all the use of wood, Tennessee’s forests are growing wood twice as fast as it is being harvested for wood products. Each year, an average of 236,400 acres is affected by timber harvest. Of that, 176,400 acres is selectively cut and 60,000 acres is clear-cut.

Private ownership of forestland is shifting from farmers to absentee landowners. The number of landowners is increasing sharply and average tract size is decreasing.

**ACTIVITY 1: PARTS OF A TREE**

*Getting Started:*

- Distribute copies of PARTS OF A TREE student activity page.

*Procedure*

- With the students, label the diagram and discuss as much information from the supporting information as you feel appropriate.

- As you identify each part of the tree also share how trees help humans and what we get from trees.

**o Tree Trunk — Lumber**

* to build houses
* furniture
* baseball bats (wooden ones)
* flooring
* paper
* cardboard

**o Bark — Flavorings**

* birch beer
* cinnamon

**o Leaves — Diverse Products**

* oxygen
* flavoring (bay leaves, some tea)
* beauty
Roots — Diverse Products
* erosion control (holding soil in place)
* flavoring (root beer)
* furniture (Cypress knees)

Fruit — Food and Flavorings
* apples
* peaches
* pears
* cherries
* walnuts
* pistachios
* pecans
* cashews
* cola
* cocoa (Chocolate)
* oranges
* grapefruit
* lemons

Whole Tree
* holiday decorations
* windbreaks
* shade and cooling
* beauty

• Have the students identify which are raw natural resources and which are finished products.

• Share with students that trees are a renewable natural resource and are farmed like other crops. They are bred to have special traits, planted, managed, fertilized, and harvested on a schedule. Ask if they have seen signs that say TREE FARM.

• Have the students complete the PRODUCTS FROM TREES activity sheet.

ACTIVITY 2: LISTENING LEAVES
Getting Started:
• To begin this activity, make a copy of the “Listening Leaves” sheet for each student.
• Your students will need a pencil and crayons for this activity.

Procedure:
• Ask your students why they think good listening skills are important.
• Ask your students to listen very carefully as you instruct them for each line on the worksheet.
• Read the directions for line 1. Then repeat the directions once. Give the students enough time to respond and then move ahead to line 2. Repeat this process until directions for each line have been read.

“Listening Leaves” Activity Sheet Directions:
1. Using your pencil, put an “x” over the third tree in line 1.

2. Color the second leaf orange in line 2.

3. Draw a blue square around the fifth tree in the third line.

4. Count the leaves in line 4. Write the total number of leaves in the blank provided.

5. Using your pencil, draw a circle around the object that is different in line 5.

6. Next to the leaf in line six, draw one that looks just like it. Then color it red.

7. Listen carefully to the following story:

   Once upon a time there was a tree named Tommy. Tommy was a very tall and strong tree. He was covered in green leaves that turned orange in the fall. Tommy’s best friend was a little boy named John. John would visit Tommy every afternoon and swing on his branches, or climb, or just sit quietly underneath him.

   1. What was the tree’s name?
   2. What color do the tree’s leaves turn in the fall?
   3. Who is Tommy’s best friend?

8. Using your pencil, draw a triangle between the first and second tree in line 9.

ACTIVITY 3: ONE TREE, TWO TREES
Getting Started:
• To begin this activity, make a copy of the “One Tree, Two Trees” worksheet on page 7.

Procedure:
• Distribute a copy of the “One Tree, Two Trees” activity sheet to each student. Read the directions and complete the worksheet.
ACTIVITY 4: LEAF PATTERNS
Getting Started:
• To begin this activity, make a copy of the “Leaf Patterns” worksheet.

Procedure:
• Take your students on a walk around the school and gather as many different types of leaves as possible.

• Point out the different shapes and colors of the leaves. Have your students guess why leaves are different shapes and colors.

• Explain to your students the important roles that leaves play in the life of a tree.

• Distribute a copy of the “Leaf Patterns” activity sheet to each student. Read the directions and complete the worksheet.

ACTIVITY 5: THE SHAPE OF THINGS
Getting Started:
• To begin this activity, make a copy of the “The Shape of Things” patterns. In order to expedite the activity, you may want to make one copy per five students.

Procedure:
• Review shapes with your students using the circle, triangle, and square patterns.

• Have each student trace the circle, square, and triangle pattern on construction paper and cut them out.

• Take your students on a walk around the school and identify things in nature, on the playground, and in the environment that are circular, triangular, or square in shape.

• When you return to the classroom, compile a list of those items on the board.

• Next, have your students look around the room and identify more things that have a circle, triangle, or square shape to them.

• Make it a contest -- which student can come up with the most?

EVALUATIONS:
• Name parts of the tree and explain what those parts do.

• What agriculture products do we get from trees and what are some of the by-products?

• Why are good listening skills important?

EXTENSIONS AND VARIATIONS:
• Utilize your “Farm Friends” volunteer directory or contact your county Farm Bureau office to invite a tree farmer in your county or neighboring county to come speak to your class about forestry.

RESOURCES:
http://www.beconstructive.com

http://www.afandpa.org


Chambers, Catherine. Wood. Plants... page 16
Chiefari, Janet. *Logging Machines in the Forest.*


Hughes, Meredith Sayles. *Flavor Foods: Spices and Herbs.*

Hughes, Meredith Sayles. *Hard to Crack: Nut Trees.*

Hughes, Meredith Sayles. *Tall and Tasty: Fruit Trees.*

Idaho Forest Products Commission. PO Box 855,


National Arbor Day Foundation. 100 Arbor Avenue,

(hdcv.), 0881068977. (pbk.).


Wittstock, Laura Waterman. *Ininatig’s Gift of Sugar: Traditional Native Sugarmaking.*
Parts of a Tree

Label the parts of this tree use these words - Leaves, Branches, Bark, Trunk, Roots.
Draw these products that come from trees:

- Apples
- Pears
- Walnuts
- Cherries
- Maple Syrup
- Peaches
- Lumber
- Paper
# Listening Leaves

1. ![Tree Drawings](https://via.placeholder.com/150)

2. ![Leaf Drawings](https://via.placeholder.com/150)

3. ![Tree Drawings](https://via.placeholder.com/150)

4. ![Leaf Drawings](https://via.placeholder.com/150)

5. ![Leaf Drawings](https://via.placeholder.com/150)

6. ![Leaf Drawings](https://via.placeholder.com/150)

<table>
<thead>
<tr>
<th>Name</th>
<th>Color</th>
<th>Name</th>
<th>Color</th>
</tr>
</thead>
<tbody>
<tr>
<td>Timmy</td>
<td>Orange</td>
<td>Sammy</td>
<td>John</td>
</tr>
<tr>
<td>Tommy</td>
<td>Yellow</td>
<td>John</td>
<td>Joe</td>
</tr>
<tr>
<td>John</td>
<td>Green</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

8. ![Tree Drawings](https://via.placeholder.com/150)
DIRECTIONS: Count the number of trees in each line. Then draw a line from the trees to the correct number word. An example is shown below.
DIRECTIONS: Look at each line of leaves below. Can you see a pattern? Select the leaf at end of the line that continues the pattern. Circle that leaf.

Name: _______________________

Leaf Patterns
square
circle
The Shape of Things

triangle
Since the days of George Washington Carver, it has been known that the commodities produced by agriculture (corn, wheat, trees, peanuts, sweet potatoes, soybeans, etc.) can be used to make consumer goods and industrial products. In recent years, as attention has focused on the environment, the need to find substitutes for petroleum-based products that are renewable has come to the attention of the U.S. consumer. In today’s society, we are continuously bombarded by messages and reminders to do our part to “save the planet” by recycling, using conservation methods, etc. The agricultural industry is doing its part by finding alternative uses for food and fiber commodities. Corn is one example of how farmers are taking food grains and transforming them into other non-food by-products that we, as consumers, use each and every day.

Corn is a major feed grain grown by farmers in the United States. It leads all other crops in value and volume of production. According to the American Farm Bureau Federation, American agriculture supplies 41% of the world’s market share of corn. Each year, approximately 70 million acres of corn is planted and harvested throughout the country. As a matter of fact, corn is the third largest commodity produced in the U.S. Only cattle and calves and dairy products surpass it. 1999 USDA statistics show Iowa as the largest corn producing state, followed by Illinois, Nebraska, Indiana, and Minnesota. Tennessee ranks 18th in the country in corn production.

ALL ABOUT CORN ...

An ear of corn averages 800 kernels in 16 rows. A pound of corn consists of approximately 1300 kernels, while an acre of corn, yielding 100 bushels, produces approximately 7,280,000 kernels. That’s a lot of corn! Corn is grown on every continent in the world except Antarctica. A number of hybrids have been developed to improve corn production yields and to make it more adaptable to the different climates and growing conditions in which it is grown across the world.

CORN BY-PRODUCTS:

Thanks to modern technology and advancements, there are uses for every part of the corn plant today. This, of course, was not always the case. Just 100 years ago the only part of the corn kernel that was extracted and refined for use was the starch. Now, corn can be made into fuel, abrasives, solvents, charcoal, animal feed, bedding for animals, insulation, smoked meat, and adhesives just to name a few items. Corn starch can be found in photographic film, baby diapers, paste, and even shoe strings. The kernel is used as oil, bran, starch, glutamates, animal feed and solvents.
The silk is used as part of animal feed, silage, and fuels. Husks are made into dolls and used as filling materials. The corn stalk is used to make paper, wallboard, silage, syrup, and rayon. Corn oil and corn-starch are used to manufacture biodegradable plastic, as will be illustrated in the following demonstration. And, of course, let us not forget that corn can also be used as food!

This lesson activity will highlight plastic as one biodegradable object that is made from corn. However, there are others. Golf tees, some tableware, and packing peanuts are already being made from corn.

ACTIVITY 1: WHERE DO WE GET PLASTIC?

Getting Started:
Gather items made of plastic and contact your “Farm Friends” to obtain items made from plastic made from corn (biodegradable corn stach bags, golf tees, corn pens, newspapers printed with corn oil ink, corn starch tableware, and packing peanuts)

Procedure:
• Ask the students how they eat corn.

• Have the students complete the I LIKE CORN activity page.

• Ask the students, “What do we use that is made from plastic?” Make a list from their ideas.

• Ask the students, “What do we use to make plastic? What is it made from?” (petroleum)

• Ask the students, “Where does petroleum come from and what is it?”

• Discuss that oil is a natural resource that is non-renewable. Explain where we buy oil from and that many of these countries are either not politically stable or friendly to the United States. So, we are looking for other sources of the products that are made from oil.

• Explain that we are learning that farm products can be made into much more than food.

• Display the corn-based plastic products and explain that they are made from corn. Also explain that plastics made from corn will break down in the environment in a relatively short time but plastics from petroleum products will last hundreds of year.

• Conduct an experiment with the corn-starch bags and regular plastic bags to see which ones will break down most quickly.

• Have students design the experiment. Ask:
  • “If we were going to test which bag would break down fastest, how could we do it?”

• Some areas which may affect biodegradation that students need consider are: exposure to sunlight, water, heat, contact with soil, presence of animals such as earthworms.

• Ask the student, “Why is important to find other sources to replace oil?”

ACTIVITY 2: PLASTIC CORN

Getting Started:
To begin this activity, gather together the following materials. The “ingredients” listed will include enough to make plastic for 30 students.

Materials needed:
• Microwave
• 2 C. cornstarch
• 1/4 C. corn oil
• 2 C. water
• 30 resealable plastic bags
• 2 pkgs. food coloring
• Medicine droppers
• Teaspoons and tablespoons

Procedure:
To make plastic, follow the following directions:

• Mix 2 tablespoons of cornstarch together with 2 tablespoons of water, and 2 drops of corn oil in a resealable plastic bag.

• Add 2 drops of your favorite food coloring to the mixture.

• Seal the bag and knead well to a uniform consistency.
• Heat the mixture in a microwave for 20 to 30 seconds at a high setting. (Note: An adult will need to do this part! Use extreme caution! This is very hot!)

• After the product cools, have students create a shape with the biodegradable plastic.

• After the plastic is manufactured into a shape ask the students, “Would you point out which is the natural resource and which is the finished product.”

ACTIVITY 3: WHAT CAN WE MAKE?
Procedure:
• Ask the students, “What products could we make out of this kind of plastic that is biodegradable?”

• Have the students invent their own biodegradable plastic product and draw a sample.

• Compare this biodegradable substance with other plastics. How are they alike? How are they different?

EVALUATION:
• Assess the participation in designing the experiment, outcome of the experiment and reporting out of the findings.

• Assess the success of the plastic making.

• Assess the creativity and practicality of the biodegradable plastic invention.

• Have the students develop a skit in small groups of five that details why we should find alternatives to petroleum and how this can protect the environment.

EXTENSIONS AND VARIATIONS:
• Utilize your “Farm Friends” directory or contact your county Farm Bureau office to invite a corn farmer in your county or neighboring county to come speak to your class about growing corn. Don’t forget to ask ... he or she may be able to provide samples of corn for your classroom.

• Math: Incorporate a math activity using the shapes your students created from their biodegradable plastic. How many were square? Round? How many were red? Blue? Green? etc... What was the most popular shape? The least popular? What was the most popular color? The least popular? Who had the most unusual design? Have the students use the graph on page 20 and 21 to plot their answers.

• Art: Make your very own corn picture. Use the patterns provided on page 22. Cut two of the husk pattern using green construction paper. Glue these to poster board (the small fourth sheets work best). Hand each student a resealable plastic bag. In each bag, place a handful of plain popcorn (no salt or butter) that has been prepopped. Then sprinkle a small amount (depending on the amount of popcorn) or yellow tempura paint in each bag. Seal the bags and then shake until the popcorn is completely covered. Glue the yellow popcorn on the posterboard between the two husks to look like corn before it is harvested.

• Nutrition: Have a tastetesting party, using the “I Like Corn!” worksheet on page 23. Suggested recipes are listed on page 24.

• Language Arts: The word corn begins with the letter “C”. How many other words can your students think of that begin with a “C”. How many other food words begin with the letter “C”. There are many words in which the word “corn” can be found. Some examples include corny, cornucopia, etc... How many can your students name?

RESOURCES:


## I Like Corn!

Put a ☑️ by the kind of corn you like to eat.  
Put a ☐️ by the kind of corn you do not like to eat.

<table>
<thead>
<tr>
<th></th>
<th>I like it.</th>
<th>I do not like it.</th>
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</thead>
<tbody>
<tr>
<td>POPCORN</td>
<td>[Diagram of popcorn]</td>
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<tr>
<td>CORN CASSEROLE</td>
<td>[Diagram of corn casserole]</td>
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<tr>
<td>SWEET CORN</td>
<td>[Diagram of sweet corn]</td>
<td>[Blank]</td>
</tr>
<tr>
<td>CORN PUDDING</td>
<td>[Diagram of corn pudding]</td>
<td>[Blank]</td>
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<tr>
<td>CORN on the COB</td>
<td>[Diagram of corn on the cob]</td>
<td>[Blank]</td>
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Name: _____________________________
# Our Favorite Color

<table>
<thead>
<tr>
<th>Red</th>
<th>Blue</th>
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Our favorite color shape is  ___________.

Plants... page 31
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NOTE TO TEACHERS:
The illustration to the right depicts how your corn plants should look once the art project is completed. The pattern for the husks is at the bottom of the page. You will need to cut two for each plant. The corn is made from the prepopped popcorn covered in yellow tempera paint as described in the lesson plan.
CORN PUDDING

INGREDIENTS:
• 1 can creamed corn (17oz)
• 1/2 C. sugar
• 1Tbsp cornstarch
• 1/2 tsp. vanilla
• 2 eggs (beaten)
• 2 Tbsp. butter (melted)
• 1/2 C. milk

DIRECTIONS:
Combine all ingredients in order given above. Mix well. Pour into casserole dish. Back at 350º for 45 minutes.

CORN CASSEROLE

INGREDIENTS:
• 1 pkg. Jiffy cornbread
• 3/4 C. vegetable oil
• 4 eggs (beaten)
• 2 cans cream-style corn (14 oz)
• 2 tsp. garlic salt
• 1/3 C. grated cheese (for topping)

DIRECTIONS:
Mix ingredients together (except for cheese) and bake in a 2-quart casserole dish which has been oiled. Back at 325º for 45 minutes. Ten minutes before done, sprinkle with grated cheese and continue baking until cheese is melted.
PASS THE PEAS, PLEASE
Nutrition and the Food Guide Pyramid

BRIEF DESCRIPTION:
The Tennessee Standards for Healthful Living include a section titled Nutrition K-2. This unit has been designed specifically to meet those standards and start your first grade students on the path to a healthy diet.

LEVEL:
First Grade

SUBJECT:
Health, Nutrition, Mathematics, Science, Social Studies, English/Language Arts, Visual Arts

SKILLS:
Apply, Classifying, Comparing Similarities and Differences, Comprehending, Counting, Creating, Estimating, Following Directions, Identifying, Listening, Listing, Matching, Observing, Reading Charts and Graphs, Recognizing Relationships, Recording, Sorting

OBJECTIVES:
The students will:
• identify foods and their components.
• sort foods into categories on the Food Guide Pyramid.
• describe and/or label the sections of the food guide pyramid, including the number of servings of each section.
• categorize foods by their origins and ingredients.
• match foods to categories of the food guide pyramid.
• identify the source of foods.
• sequence a food from the farm to the consumer and link the food to the Food Guide Pyramid.

ESTIMATED TEACHING TIME:
four 30 to 45 minute sessions

SUPPORTING INFORMATION FOR TEACHERS:
Good nutrition and sound nutritional choices are essential for a healthy life, active lifestyle, disease prevention, and alert preparedness as a student. The Tennessee Standards for Healthful Living include a section titled Nutrition K-2 that details areas that students should possess. This is important not only to developing sound nutrition habits early but also understanding where their food originates.

The Food Guide Pyramid was developed by the United States Department of Agriculture and the Department of Health and Human Services. It is a general guide, not a rigid rule, to assist consumers in making food selections toward a healthy diet. It has long been recognized that foods from all the food groups must be utilized to achieve a healthy food balance.

The Food Guide Pyramid emphasizes foods from five food groups. Each of these food groups provides some, but not all, of the nutrients you need. Foods in one group can’t replace those in another. No one food group is more important than another. For good health, you need them all.

The United States Department of Agriculture (USDA) created the Food Guide Pyramid as a way to graphically depict the variety and number of servings people should consume to maintain a healthy diet. The idea was to imprint the idea of foods in a shape familiar and readily understandable to all U.S. citizens. Foods have been grouped by the nutrients that each provides to the diet. This includes both macronutrients and micronutrients. The base of the pyramid consists of 6-11 servings daily of “Breads, Cereals, Rice, and Pasta” group. These are intended to be whole grain products. The second layer, somewhat smaller is divided into two sections. The section on the right is the “Fruit” group that has a recommended consumption of 2-4 servings. The section on the left is the “Vegetable” group that has a recommended consumption of 3-5 servings. These two together meet or exceed the “Five A Day” recommendation of fruit and vegetable consumption of the medical community. Above these are two more categories on the next highest level. On the right is the “Meat, Poultry, Fish, Dry Beans, Eggs, Nuts” Group at a recommended 2-3 servings. On the left is the “Milk, Yogurt, and Cheese” Group also at a recommended 2-3 servings. The apex of the pyramid states Fats, Oils, and Sweets, Use Sparingly. This section is not considered a food group and does not have a recommended serving number.
What is a serving size?
The serving sizes vary by category and type of food. In general they are:
Bread — 1 slice
Ready-to-Eat Cereal — 1 cup
Cooked Cereal, Rice, or Pasta — _ cup
Vegetables, raw and leafy — 1 cup
Other Vegetables, cooked or raw — _ cup
Vegetable Juice — _ cup
Medium apple, banana, orange, pear — 1
Cooked, canned, chopped — 1/2 cup
Fruit Juice — 1/2 cup
Milk or yogurt — 1 cup
Natural Cheeses — 1 1/2 ounce
Processed Cheese — 2 ounces
Lean Meat, Poultry, Fish — 2-3 ounces
Dry beans, tofu — 1/2 cup=1 ounce lean meat
21/2 ounce soyburger or 1 egg — 1 ounce lean meat
2 Tbsp. of Peanut Butter or 1/3 cup of nuts — 1 ounce of lean meat

Of course many of the foods we consume contain ingredients from several food groups. When using the Food Guide Pyramid it is important to break the food into its component parts. For example, a peanut butter and jelly sandwich would contain 2 servings of bread, 1 serving of lean meat equivalent, and 22% of your daily recommended fat intake. The jelly would not contain enough fruit to count as a serving of fruit.

The Pyramid is an outline of what to eat each day. It’s not a rigid prescription, but a general guide that lets you choose a healthful diet that’s right for you. The Pyramid calls for eating a variety of foods to get the nutrients you need and at the same time the right amount of calories to maintain a healthy weight.

FACTS ABOUT FOOD:
It takes many different foods to supply our bodies with all the nutrients we need to grow and function.

THE BODY’S BUILDING BLOCKS
Protein
This is what the body uses to build, maintain, and repair tissues, form hormones and enzymes, and increase resistance to infections and disease. Amino acids are the building blocks of protein. We need 22 amino acids; nine are essential and come from food.

Complete proteins contain all nine essential amino acids. Meat is an example of food that contains complete proteins. Plant proteins, when eaten alone, do not contain all of the essential amino acids in sufficient quantity and, therefore, are incomplete. Foods that are rich in protein are meats, poultry, eggs, dried beans, nuts, cheese, and Fish.

Carbohydrates
Carbohydrates supply energy. There are three different types of carbohydrates. A single food may be a source of only one type or of all three. Sugars are simple carbohydrates. They are found naturally in milk, fruit, and some veggies. Refined sugars, such as sucrose or table sugar, are found in candies and other sweets. Starches are complex carbohydrates and are found in foods such as bread, potatoes, rice, and veggies. Fiber is a complex carbohydrate that makes up the indigestible structure of plant cell walls. It can be found in whole grains, vegetables, and fruits.

Fats
Fats are concentrated source of energy. Fats in food add flavor, carry the fat-soluble vitamins A, D, E, and K, and slow digestion to provide a “full” feeling after a meal. Because fats are a concentrated source of energy, it is important to watch your intake. It is easy to decrease the fat in some by selecting a low/no fat version or removing excess fat, such as from the outer edge of meat. Other foods, such as doughnut, chips, and french fries, are high in fat you can not see. Foods high in hidden fat may contribute more fat to the diet than you realize. High fat foods should be eaten in moderation.

Vitamins and Minerals
These help your body make use of proteins, carbohydrates, and fats, and helps the body’s defenses to prevent disease. Foods from the bread, cereal, rice, and pasta group are especially good sources of B vitamins and iron. Foods from the vegetable group are especially good sources of vitamin A, as well as vitamin C and folate (a B vitamin). Foods from the fruit group are especially good sources of vitamin C, as well as vitamin A and potassium. Foods from the meat, poultry, fish, dry beans, eggs, and nuts group are especially good sources of iron, zinc, and B vitamins, including riboflavin, niacin, thiamin, and vitamin B-12. Foods from the milk, yogurt, and cheese group are especially good.
sources of calcium and riboflavin, as well as vitamin D.

ABOUT MEAT

Lean meat provides significant amounts of several important nutrients including protein, iron, zinc, and B vitamins. Meat is an excellent source of complete, high-quality protein. Iron is most often lacking in diets of children, teens, pregnant or breast-feeding women, and athletes. Meat is an excellent source of easily absorbed iron. Zinc is often lacking in the diets of children, women, and athletes and is very difficult to obtain when meat is not included in the diet. The B vitamins found in meat include B-12, which is only naturally found in animal foods. Beef, in recommended serving sizes, provides more thiamin (another B vitamin) than any other food commonly eaten.

The USDA’s Food Guide Pyramid is intended to be just that, a guide. Each of us is different and we must adjust our food intake to our activity level and nutritional needs. The USDA is currently determining whether or not to modify the food guide pyramid based on recent research findings. Please stay tuned to any changes that may be made prior to these lessons being revised and make adjustments needed to keep your students on track making healthy food choices. For greater detail please see the resources listed at the end of this unit.

ACTIVITY 1: THE FOOD GUIDE PYRAMID

Getting Started:
• Make copies of the Food Guide Pyramid, one per student. Bring to class a 1 cup measuring cup and a 1/2 cup measuring cup for display purposes.

Procedure:
• Introduce this unit by reading one of the following books:

  • Ask the students, “What are your favorite foods?”

  • Explain that it is important to eat healthy to obtain all of the nutrients to build a healthy body.

  • Ask the students, “Whose parent tells them to drink their milk so they can have healthy bones and teeth?” Explain that milk contains calcium and phosphorous that are needed to build strong bones and teeth.

  • Introduce the Food Guide Pyramid and tell the students that the government developed this to help children and adults learn how to eat healthy. Explain that we need to eat a variety of foods every day to be healthy.

  • Distribute copies of the Food Guide Pyramid to each child.

  • Ask students to look at the pyramid and identify from the artwork what the categories are and what are the number of servings in each category. Select one category at a time and review the information.

  o “What is the largest category?”
  o “What foods are in this category?”
  o “How many servings should you eat every day?”
  o “What is a serving?” Share that information with the students. Use the 1 cup measuring cup and a 1/2 cup measuring cup to show serving sizes.

  • Make a list of all the foods you can think of that fit into this category and post it on the board.

  • Ask the students, “If you make a sandwich with two slices of bread how many servings is this? (2) If you eat 1 cup of spaghetti and a slice of whole wheat bread, how many servings is this? (3) If you eat a bowl of hot oatmeal and it contains _ cup of oatmeal how many servings is this?

  • Repeat this process with each category. When you get to the top, inform the students that the top of the pyramid is not a serving. This area indicated foods that you should eat very little of. What is in this category?
ACTIVITY 2: WHERE DOES IT FIT?

Getting Started:
- Have students bring in food pictures cut from magazines that have food pictures, food packaging labels, newspaper ads for foods, etc or provide copies for cutting up in class.

Gather the materials listed below:
Large sheets of newsprint or flip chart paper (one for each group of 3-4 students)
Glue
Scissors
Markers

Procedure:
- Divide students into small groups of 3-4 students and provide each with a large sheet of paper.
- Have each group outline a Food Guide Pyramid using their whole sheet of paper and label the categories correctly.
- Have students sort out their pictures and food labels and place them on the correct category. Does the group agree with these placements? They may need help for processed foods.
- Once the group all agrees, have them paste their pictures onto their pyramids.
- Display the finished pyramids.

ACTIVITY 3: FOOD FINDS

Getting Started:
- Make copies of the food pictures on the following pages. You can make a set for each student or simply do one page at a time.

- Hang a picture of the food guide pyramid poster on the wall. Place baskets or boxes underneath the poster. Label each basket or box with the following: fats, oils, and sweets; fruits; milk, yogurt, and cheese; vegetables; meat, poultry, fish, dry beans, eggs, and nuts; and bread, cereal, rice, and pasta.

Procedure:
- A week later conduct this activity to reinforce what was taught a week ago.
- Distribute the page(s) to each student.
- Following the directions printed on the card, have your students color the food picture and then write the name of the food on the line.
- Have the students place the picture of their food in the correct food group box or basket or tape the picture of their food to the FGP poster in the appropriate food group.

ACTIVITY 4: SORTING AND SEQUENCING

Getting Started:
- Make copies of the sorting and sequencing activities “Where Do These Foods Grow?” and “From Farm to You”. There should be one copy for each student.

Procedure:
- Discuss with students where foods come from — the farm.
- Ask students to brainstorm all of the meats that they can think of. Write these on the board or flip chart as they list them. Explain that meats and milk come from animals.
- Now create categories of beef, pork (hogs), lamb, poultry, and categorize which meats come from which animals. Repeat this with other foods. Don’t overlook dairy products. The category title should be either dairy cattle or milk. Many students may not know which foods are made from milk.
- Have students complete the student activity pages: “Where is it from? Where does it fit?” and “Where Do These Foods Grow?”
- Discuss with the students what part of the plant we eat. Make a list of foods from plants, Then categorize with the students which part of the plant that these foods come from: what foods grow underground, what foods come from plant leaves, what foods come from plants, etc. “What Part of the Plant?” Be careful of using what comes from roots because many foods that grow underground are not roots but are actually modified stem structures (onions, potatoes, shallots, etc.)
- When these are complete, discuss how foods and fibers get from farm to consumer. Have the students complete the “From Farm to You” activity page.
ACTIVITY 5: HUMAN FOOD CHAIN

Getting Started:
• Make a copy of the food pictures and clue strips on pages. You can laminate them for durability or leave them as they are.

Procedure:
• Shuffle the strips.

• Give each student a strip.

• Have the students read the clue at the bottom of the strip to themselves. Then have them look for the picture of the food being described. The food is on another student’s card. For example, “I am baked into a loaf. You use me to make sandwiches.”. This student should be looking for the classmate who has a picture of a loaf of bread.

• Once the student finds their food, have them stand beside the other student. Once all the foods have been identified, the students should have formed a big circle.

EVALUATION:
• Name the different food groups.

• How many servings should you eat from each food group?

• Name some examples of different foods from each of the food groups.

• Which food group is the largest?

• Which food group is the smallest?

• Give students a day’s worth of foods consumed or have them keep track of their food for a whole day, and ask them to categorize them into a food guide pyramid, and determine the number of servings.

• Assess completion of student pages.

• Give students several commodities such as a jar of mayonnaise, a jar of peanut butter, a jar of jam, a loaf of bread and have them draw how the product got from the farm to them.

• Have students keep a food diet for 24 hours and evaluate how balanced their diet is.

EXTENSIONS AND VARIATIONS:
• Have the students write their own nutrition story (fact or fiction). This can be done in pictures.

• Download the Food Guide Pyramid for Small Children from the USDA Web site, make copies one per student. Have them conduct a comparison with the previously used Food Guide Pyramid. Find the similarities and differences. Discuss why this Food Guide Pyramid is different and why small children would have different needs than older children.

• Create a large Food Guide Pyramid on the classroom, gym, hallway or cafeteria floor using masking tape. Make it several feet taller than the students. Use the information students gathered in keeping track of their food consumption and sue it to play a twister game. For example, have the students identify which item they ate the most of and place their left foot on this section of the pyramid. The right foot goes onto the next highest category, etc. If they ate a well balanced diet they should be able to stretch out and reach each category. If they ate too much added fats, oil, or sweets, they may have a problem.

• Have the students create their own advertisement of a fruit or vegetable.

RESOURCES:


Color the food.

Write the name of the food on the line below.

Place the food in the food group that it belongs.

Color the food.

Write the name of the food on the line below.

Place the food in the food group that it belongs.
Color the food.

Write the name of the food on the line below.

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Place the food in the food group that it belongs.

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Color the food.

Write the name of the food on the line below.

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Place the food in the food group that it belongs.
Color the food.

Write the name of the food on the line below.

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Place the food in the food group that it belongs.

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Color the food.

Write the name of the food on the line below.

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Place the food in the food group that it belongs.

Nutrition ... page 10
Color the food.

Write the name of the food on the line below.

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Place the food in the food group that it belongs.

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Color the food.

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Place the food in the food group that it belongs.
Color the food.

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Place the food in the food group that it belongs.

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Place the food in the food group that it belongs.

Color the food.

Write the name of the food on the line below.

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Place the food in the food group that it belongs.

Nutrition ... page 13
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Place the food in the food group that it belongs.

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Place the food in the food group that it belongs.
Color the food.

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Place the food in the food group that it belongs.

Color the food.

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Place the food in the food group that it belongs.

Nutrition ... page 15
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Place the food in the food group that it belongs.

Color the food.

Write the name of the food on the line below.

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Place the food in the food group that it belongs.
Color the food.

Write the name of the food on the line below.

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Place the food in the food group that it belongs.

Color the food.

Write the name of the food on the line below.

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Place the food in the food group that it belongs.

Nutrition ... page 17
Color the food.  

Write the name of the food on the line below.  

____________________  

Place the food in the food group that it belongs.  

Color the food.  

Write the name of the food on the line below.  

____________________  

Place the food in the food group that it belongs.
Color the food.

Write the name of the food on the line below.

Place the food in the food group that it belongs.

Color the food.

Write the name of the food on the line below.

Place the food in the food group that it belongs.
PYRAMID
PARTNERS
apple

cherries

Nutrition ... page 21
watermelon

orange
grapes

pumpkin
tomato

carrot
turnip

peas
cake

cupcake
cookies

candy
ice cream

cheese
egg
fish
chicken

steak
HUMAN FOOD CHAIN
George Washington chopped down one of these trees.

I grow in a bunch on a vine. I can be red, purple, or green.

I am a favorite summertime, picnic fruit.
I am green on the outside and red in the center.

I am fruit named for a color. I grow in California and Florida.
An ___ a day keeps the doctor away ... or so the saying goes.

I am red. I can be found in salads or sliced on a hamburger.

I am a yellow vegetable. You love to eat me on the cob.

I grow underground. I can be fixed many ways. You love me best as french fries.
I am a veggie. I have a head of white cluster flowers.
You don’t like how I taste.

I am a veggie. I am round and made up of green leaves.
You eat my leaves. I am the main part of a salad.

I am small, round, and green. I am a veggie. I grow in pods.
I taste good with mashed potatoes.

I am orange. I am a vegetable.
I am Bugs Bunny’s favorite food.
CARROT

I am carved into jack-o-lanterns at Halloween.

PUMPKIN

I am baked into a loaf. You use me to make sandwiches.

BREAD

I am used at birthday parties and decorated with candles.

CAKE

I am sweet and look like a muffin.
I taste best when covered with sprinkles and icing.
**CUPCAKE**

I am one of your favorite things to eat.  
I have many different flavors such as chocolate chip.

---

**COOKIES**

I’m one of your favorites.  But dentist do not like me.  When you go trick or treating, your sack is filled with me.

---

**CANDY**

If I’m not kept cold, I will melt.  I am put on a cone to eat.  
I come in many flavors from vanilla to rocky road.

---

**ICE CREAM**

I am made from milk.  I am yellow.  
I am put on pizza and taste great on hamburgers, too.
I come from a cow. I am part of the meat food group. I come in different cuts such as T-bone, ribeye, and sirloin.

I lay eggs. I can also be found at fast food restaurants such as KFC.

I am found in the ocean, lakes, rivers, and ponds. I am good to eat with hushpuppies and french fries.

I am part of the meat food group. I am laid by chickens. I can be scrambled, fried, or cooked sunnyside up.
Where do these foods come from? Where do they fit on the Food Guide Pyramid? Draw a line from the food to its source and then to its place on the Food Guide Pyramid.

Source: U.S. Department of Agriculture/U.S. Department of Health and Human Services
Where do these foods grow?

Draw a line from the food to where it grows. Then draw a line from the food to its place on the Food Guide Pyramid.

Source: U.S. Department of Agriculture/U.S. Department of Health and Human Services
Where do these foods come from? Where do they fit on the Food Guide Pyramid? Draw a line from the food to its source and then to its place on the Food Guide Pyramid.
Cut these pictures out and put them in the correct order from the farm to you.