

A large illustration of a peanut plant. The top part shows the green leaves and stems of the plant against a bright yellow sun. Below the ground line, the roots are shown in brown soil, with several peanut pods hanging from the roots. The background features rolling green hills and a white sun in the top left corner.

Discover the Powerful Peanut

A collection of 12, easy to implement 3rd-5th grade activities that explore peanuts and peanut production.



AMERICAN FARM BUREAU
FOUNDATION FOR AGRICULTURE



nationalpeanutboard.org



Pounds Of Peanuts

Objectives:

Students will be able to:

- interpret actual peanut yield information.
- calculate total pounds of peanuts produced on a fictional farm using real production data.

National Learning Standards:

Common Core Mathematics

- Operations and Algebraic Thinking 3.OA.2: Interpret whole-number quotients of whole numbers, e.g., interpret $56 \div 8$ as the number of objects in each share when 56 objects are partitioned equally into 8 shares, or as a number of shares when 56 objects are partitioned into equal shares of 8 objects each. For example, describe a context in which a number of shares or a number of groups can be expressed as $56 \div 8$.
- Operations and Algebraic Thinking 3.OA.3: Use multiplication and division within 100 to solve word problems in situations involving equal groups, arrays, and measurement quantities, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem.

Activity Description: With average yield information per acre, students will use paper squares/beads (each representing 1,000 lbs.) to help visualize how many pounds of peanuts are produced from one field of a set number of acres.

Materials

- Peanuts, tiles, or other easily accessible small countable objects (about 50 per student/group)
- One pound of pre-weighed peanuts

Activity Steps

Activity Prep: Note that the USDA Economic Research Service reported a peanut yield of 3,949 pounds per planted acre but for ease of calculating for students we have rounded to 4,000 pounds. ¹

Step 1: Explain to students that “yield,” when discussed

in agriculture, describes the amount of a commodity produced per acre of planted cropland. In this case, the yield of a peanut is measured in pounds per acre. Hold up one pound of peanuts to show quantity. Have students pass it around the class.

Step 2: Write the number “3,949” on the board. This is the average peanut production yield in the U.S. in 2019. Have students round this number to the nearest thousand (4,000).

Step 3: Hand out peanuts, beads, tiles, or other easily accessible small countable objects to individuals or small working groups. Give each student/group 50 objects. Explain that each object represents 1,000 pounds of peanuts.

Step 4: Write the number “1” on the board. This is the number of acres on each of the students’ farms. Using the countable objects, have students count the total pounds of peanuts that could be produced on their farm (4 tiles/4,000 lbs.). Have students continue calculating peanut yield per acre using the following sample problems.

- a) Assume you have a five-acre farm. What is your estimated peanut yield? (20 tiles/20,000 lbs.)
- b) Assume you have a seven-acre farm. What is your estimated peanut yield? (28 tiles/28,000 lbs.)
- c) Assume you have a 10-acre farm. What is your estimated peanut yield? (40 tiles/40,000 lbs.)
- d) Assume you have a 12-acre farm. What is your estimated peanut yield? (48 tiles/48,000 lbs.)

Processing Questions:

1. What things might cause a farmer to have a higher yield, or more peanuts, grow in an acre?
 - a. Listen for good weather, the right amount of water, nutrients in the soil, absence of pests, etc.
2. What things might cause a farmer to have a lower yield, or less peanuts, grow in an acre?
 - a. Listen for bad weather, a lack of water or nutrients, pests, etc.

It's A Fact!

Peanut plants are good for the ground. Through a process called nitrogen fixation, they put nitrogen back in the soil that other plants need to grow!



Wonderful Water

Objectives:

Students will be able to:

- determine how many peanut plants can be supported with a given amount of water available.

National Learning Standards:

Common Core Mathematics

- Operations and Algebraic Thinking 3.OA.4:
Determine the unknown whole number in a multiplication or division equation relating three whole numbers. For example, determine the unknown number that makes the equation true in each of the equations
 $8 \times ? = 48$, $5 = ? \div 3$, $6 \times 6 = ?$.

Activity Description: Student groups will each be given a certain amount of water in a container. Students will measure the amount of water they have and create an algebraic equation knowing that two inches of water are needed per plant to determine how many plants could be supported with their amount of water.

Materials

- Bottle of water (1 per group of students)
- Clear plastic cups (2 per group of students)
- Ruler (1 per group of students)
- Permanent marker or pen (1 per group of students)

Activity Steps

Activity Prep: Set out lab supplies in a designated area.

Step 1: Share with students that peanut plants are efficient water users. It only takes two inches of water per week for a peanut plant to develop kernels. □

Step 2: Split students into groups of four. Have each group get the lab supplies listed above. Provide the following instructions:

- a) Pick up one empty cup. Using the ruler and pen, mark a line two inches up from the bottom of the cup.
- b) Determine the amount of water in the bottle by pouring it into the cup with the two-inch line. After filling to the line, students should pour the water

into the empty cup. Remind students to count the amount of times they repeat this process.

- c) Ask students to record the number of times they filled to the two-inch line on a piece of paper.
- d) Ask students to determine how many weeks they could water their peanut plant with the water they have been given (This number will be equal to the number of two-inch measurements taken.).

Step 4: Have students complete the following math problems. For all problems, maintain the assumption that peanuts need two inches of water per week.

Problem: You have enough to water your peanuts for ___ weeks. How many inches of water do you have? $2 \text{ inches} \times \text{___ weeks} = n \text{ total inches}$

- a) 6 weeks (answer: 12 inches)
- b) 3 weeks (answer: 6 inches)
- c) 8 weeks (answer: 16 inches)

Step 5: Once students have mastered the problems above, ask them to complete the following problems.

Problem: For how many weeks could you water your peanuts if you have ___ inches of water? $2 \text{ inches} \times n \text{ weeks} = \text{___ inches}$

- a) 14 inches (answer: 7 weeks)
- b) 8 inches (answer: 4 weeks)
- c) 10 inches (answer 5 weeks)

Processing Questions:

1. Why do plants need water?
 - a. Listen for students to identify that water carries important nutrients into the plant.
2. What does a plant look like that does not get enough water?
 - a. Listen for students to describe a limp plant. Water fills the cells in the plant and helps the plant stand up. This is called turgor pressure. Without water, plants wilt.
3. Why do farmers work hard to make sure peanut plants get just the right amount of water?
 - a. Listen for students to identify that too much or too little water can harm plants, it is expensive to irrigate fields, and farmers want to help the environment.

It's A Fact!

Peanuts are efficient water-users. For example, it takes about 4.7 gallons of water to grow an ounce*, or about a handful, of peanuts. It takes about 80.4 gallons of water to grow an ounce* of almonds and 73.5 gallons of water to grow an ounce* of walnuts. *Based on blue and grey water. ²



Growing America

Objectives:

Students will be able to:

- identify peanut-growing states in the U.S.
- use fractions to evaluate peanut production by state.

National Learning Standards:

Common Core Mathematics

- Number and Operations 3.NF.3: Fractions: Explain equivalence of fractions in special cases, and compare fractions by reasoning about their size.

National Social Studies and History Standards

- NSS-G.K-12.1: Understand how to use maps and other geographic representations, tools, and technologies to acquire, process, and report information from a spatial perspective.

Activity Description: Students will label and color a map of the United States to indicate states where peanuts are commercially grown and their respective percentages of peanut production.

Materials

- Blank map of the United States (1 per student)
- Crayons, markers, or colored pencils
- Projector or large map poster
- Peanuts

Activity Steps

Activity Prep: Print United States maps and set out coloring utensils.

Step 1: Hold up peanuts and ask students where peanuts come from. Share with students that peanuts grow on plants not trees, and nearly 10 percent of the world's peanuts are grown in the United States!³

Step 2: Distribute coloring utensils and copies of the United States map.

Step 3: Tell students that peanuts are grown commercially in 15 states. Three of these states are minor producing states. They produce fewer peanuts. Twelve

of these states are major producing states. They produce nearly the entire U.S. peanut crop!

Step 4: Have students identify the following states and fill in with a single color on their map: Arizona, Tennessee, Louisiana. These are minor peanut producing states. Show these states on a large map to assist students as needed.

Step 5: Using a projector, map poster, or white board, introduce students to the major peanut producing states and their respective share of U.S. peanut production. Have students color and label each state with the appropriate fraction. Fractions are listed with common denominators for ease in comparison.

U.S. Peanut Production⁴

- Georgia = (50/100) 50.4%
- Florida = (11/100) 11%
- Alabama = (10/100) 10%
- Texas = (9/100) 9%
- North Carolina = (8/100) 8%
- South Carolina = (4/100) 4%
- Arkansas = (3/100) 3%
- Virginia = (2/100) 2%
- Mississippi = (1/100) 1%
- Oklahoma = (1/100) 1%
- Missouri = (1/100) 0.5%
- New Mexico = (1/100) .02%

Step 6: On the bottom or back of the map, have students list the major peanut producing states (12) in order of production, from highest to lowest by comparing fractions. You may wish to have students simplify fractions after comparing.

Processing Questions:

1. What do you notice about your peanut map?
 - a. Listen for students to identify that the peanut producing states are along the bottom of the map (southern region).
2. Why do you think peanuts are grown in this area?
 - a. Listen for students to identify the warm climate.

It's A Fact!

The United States has about three percent of the acres in the world that are planted with peanuts, but grows nearly 10 percent of the world's crop! This efficiency is thanks to technology, environment, and farmers who care for the land!⁵



All About Allergies

Objectives:

Students will be able to:

- describe the scientific process that yields an allergic reaction.
- discover what is fact and myth regarding peanut allergies.
- identify steps to take if a friend has a food allergy.

National Learning Standards:

Next Generation Science Standards

- 5-PS1-1: Develop a model to describe that matter is made of particles too small to be seen.
- 4-LS1-2: Use a model to describe that animals receive different types of information through their senses, process information in their brain, and respond to the information in different ways.

Activity Description: Students will engage in a hands-on activity, similar to a relay race, where select students act as the body's immune system and other students act as ingested food. Students will "travel" inside the body of a large, imaginary person to experience the reaction first-hand.

- When food ingested triggers an allergic reaction, the body (group of students) will begin a relay race releasing histamine and other chemicals (additional group of students) who race to stick signs on a drawn outline of a human indicating ways a reaction can manifest itself (respiratory issues, gastrointestinal issues, etc.).

Materials

- Large poster paper or white board
- Index cards (9)
- Markers (1 set)
- Blue painters tape (1 roll)
- Paper grocery sack (1)
- Cotton balls (1 bag)

Activity Steps

Activity Prep:

- Draw an outline of a human body on a large poster paper or white board.
- Prepare a set of Allergic Reaction index cards by writing the following symptoms, one on each card: itchy mouth, hives, swelling, wheezing, trouble breathing, stomach pain, diarrhea, vomiting, dizziness.
- Roll nine pieces of blue painter's tape in preparation for use with index cards.

Step 1: Ask students to share common allergies they have heard of. List allergies on the board. Ask if any students in the class have specific allergies. Share that food allergies affect 1 in 13 children. That is about two students in every class!⁶

Step 2: Ask students what happens when someone has an allergic reaction. Capture brainstormed notes on the board. Share with students that different allergies cause different reactions, but today students will get a chance to learn generally how allergies work!

Step 3: Explain that we often notice an allergic reaction by the visible symptoms. Refer to the list generated by students to validate correct signs of allergic reaction. Hold up each Allergy Reaction index card created before the class to fill in additional information as needed.⁷

- If students see any of these signs in themselves, or a friend, they should seek help immediately! For serious reactions, including trouble breathing, call 9-1-1.

Step 4: Divide students into two groups. Send each group to opposite sides of the room. Give one group a bag of cotton balls. Give the second group the stack of Allergic Reaction cards. Place the grocery sack, open, in the center of the room.

It's A Fact!

Peanut allergies affect just 0.6 percent of the U.S. population.⁹ For more information on food allergies, including peanut allergies, visit www.peanutallergyfacts.org.

Science: All About Allergies (con't)

Step 5: Provide directions for relay race: Students are virtually traveling inside the body to see the microscopic reaction of how the body engages an allergic reaction.

- a) The cotton balls represent food. One at a time, students on the cotton ball side will run a cotton ball to the paper sack. The paper sack represents the human's digestive system.
- b) The other side of the room represents the body's immune system. As soon as a cotton ball is dropped in the sack representing food being ingested, the immune system team will act out the process of releasing histamines and other chemicals by sending one person with an Allergic Reaction index card to race to the outline of a person on the board and tape his/her card to the outline.
- c) The class will compete as one team, racing for the fastest time.

Step 6: Refer to the posted human body outline with allergic reaction cards. Share with students that epinephrine is a hormone also known as adrenaline. It can be given to a person having an allergic reaction to stimulate blood flow in the body and lessen the symptoms of the allergic reaction.⁸

Extension Opportunity: Invite a school nurse to visit the classroom to share more about allergies and what to do if you notice an allergic reaction.

Processing Questions:

1. What system in the body causes an allergic reaction? Hypothesize why the body releases these histamines and chemicals.
 - a. Listen for students to share that the immune system in the body mistakenly believes the food is harmful.
2. If you see signs of an allergic reaction in a friend or family member, what may have happened in the past few minutes to two hours? What should you do?
 - a. Listen for students to share that the person may have ingested something that caused the immune system to release histamines or other chemicals, which trigger visible reactions. Students should call 911 and seek out an adult for help.



A Nutty Life

Objectives:

Students will be able to:

- identify the stages in the peanut lifecycle.
- create a timeline showing peanut growth and development over the course of one year.

National Learning Standards:

Next Generation Science Standards

- 3-LS1-1: Develop models to describe that organisms have unique and diverse life cycles but all have in common birth, growth, reproduction and death.
- 5-LS1-1: Support an argument that plants get the materials they need for growth chiefly from air and water.

Activity Description: Students will plant a peanut and discuss the lifecycle of the plant. As a class, students will create a timeline showing the peanut growth process over time.

Materials

- Egg cartons (1 per group of 3-4 students)
- Soil
- Peanut seeds
- Water
- 11x17 sheet of paper (1 per group of 3-4 students)
- Markers, crayons, or colored pencils

Activity Steps

Activity Prep: Set out planting supplies.

Step 1: Split students into groups of three to four.

Step 2: Have each group fill one egg carton with potting soil and get 12 peanut seeds.

Step 3: Instruct students to use their pinkie finger to make a hole for the seed in each compartment of the egg carton. Students should push their finger in until the soil is to the top of their fingernail. Have students place one seed in each hole and cover with soil.

Step 4: Completely saturate each compartment with water.

Step 5: Place in a warm area where light will reach the seeds.

Step 6: Post the following timeline for students to see, using a projector or white board:

1. In the U.S., peanuts are planted after the last frost in April through May.
2. In 10 days, peanut seedlings poke through soil.
3. In 40 days, yellow flowers appear on the plant.
4. Flowers pollinate themselves and the petals fall off. The peanut ovary, called a "peg," begins to form.
5. The peg grows away from the plant and back into the soil. The peg turns into a peanut! The peanut is technically the fruit of the plant.
6. In four to five months, peanuts are harvested.

Step 7: Have groups create a visual timeline on a large (11 x17) sheet of paper. As the peanut plants grow in the classroom, have students note observations on their timelines.

Processing Questions:

1. What is unique about the life cycle of the peanut plant?
 - a. Listen for students to observe that the plant flowers above ground, but the fruit (peanut) grows below ground.
2. What is unique about peanuts compared to other common nuts?
 - a. Listen for observation that most other nuts, like pecans and walnuts, grow on trees.

It's A Fact!

Peanuts belong to a family of plants called legumes. Legumes are amazing because they put nitrogen back into the soil, which helps other plants grow!



Delicious And Nutritious

Objectives:

Students will be able to:

- trace the flow of energy from sun to peanut plant to person consuming the peanut.
- identify the nutritional benefits of including peanuts and peanut products in a healthy diet.

National Learning Standards:

Next Generation Science Standards

- 5-PS3-1: Use models to describe that energy in animals' food (used for body repair, growth, motion, and to maintain body warmth) was once energy from the sun.

Activity Description: The class works together (as a large group or in collaborative working groups) to move cotton balls (representing energy) from an area identified as the sun, to a peanut plant, and finally to three paper sacks labeled "Protein", "Vitamins and Minerals", and "Good Fats".

Materials

- Image of the sun (1)
- Peanut plant or an image of peanut plant (1)
- Paper grocery sacks (1 per group of 5-6 students)
- Markers (1 marker per group of 5-6 students)
- Plastic spoons
- Cotton balls (1 bag)
- Peanuts in shell (At least 10 per group of 5-6 students)

Activity Steps

Activity Prep:

- Create an image of the sun and post on one side of the room. Place the bag of cotton balls near the image of the sun.
- Place a peanut plant, or image of a peanut plant in the center of the room. Empty bag of peanuts near peanut plant.

Step 1: Divide students into groups of five to six. Give each group a paper sack and a marker.

Step 2: Inform students that peanuts are a nutritional food choice! Packed with 30 essential nutrients, peanuts can be a "nutrient-rich" part of a healthy diet. Using a projector or white board, display the key nutrients provided by peanuts. Have groups capture these nutrients on their paper sack and draw an icon to represent each.

- Proteins: necessary for structure, function and regulation of the body's cells, tissues and organs.
- Fats: unsaturated fats (mono and poly) are "good" fats to choose more often, while saturated fats should be avoided; fats can be a source of stored energy; even though not all fat is bad, eating too much fat is not healthy. "Good" fats help you feel full and store energy.
- Antioxidants: help reduce the damage of oxygen in tissues.
- Fiber: keeps your digestive tract healthy!
- Calories: provide nutrient-rich energy for your body.

Step 3: Place paper sacks on the side of the room opposite the sun. Have groups line up near the sun.

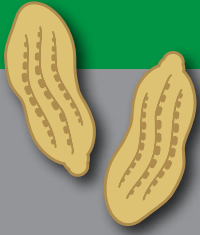
Step 4: Explain the relay race. Energy from the sun makes peanut plants grow, which then provides energy for humans. Use a plastic spoon to pick up a cotton ball near the sun (unit of energy). Carry the cotton ball to the peanut plant in the center of the room. Drop the cotton ball and pick up one peanut. Use the spoon to carry the peanut to the paper sack. Race to see how quickly your group can get 10 peanuts in your paper sack!

Processing Questions:

1. Describe the energy cycle in the activity we just completed.
 - a. Listen for students to articulate how energy moves from the sun to the plants to humans through consumption.
2. Hypothesize why peanuts, and specifically peanut butter, are in high demand at food pantries where people need food.
 - a. Listen for students to highlight the nutrient density of peanuts and the amount of essential nutrients (30) contained in peanuts.

It's A Fact!

Peanut butter is an excellent source of niacin, and a good source of vitamin E and magnesium.¹⁰ For more information on peanut nutrition, visit peanutinstitute.com.



Social Science



Peanut Butter Caper

Objectives:

Students will be able to:

- determine the correct order of moments in peanut history and the development of peanut butter.

National Learning Standards:

National Social Studies and History Standards

- NSS-USH.K-4.3: The history of the United States: democratic principles and values and the people from many cultures who contributed to its cultural, economic, and political heritage

Activity Description: Students will race to put a series of statements in sequence about the history of peanut production and the development of peanut butter. Once assembled correctly, the information will yield a clue to solving a fun peanut riddle.

Materials

- “Peanut History” cards (1 set per group of 2-3 students)
- Paper clips or envelopes (1 per group of 2-3 students)

Activity Steps

Activity Prep: Copy “Peanut History” cards and cut apart one set for each group. Randomize order and paper clip or place in an envelope. Copy the following riddle onto board in classroom for all students to see: A tasty treat, packed with power, below ground the fruit, above ground the flower.

Step 1: Divide students into groups of two to three. Give each group a set of “Peanut History” cards. Challenge groups to review and place in chronological order.

- Answer Key: (P) No Date (E) 1700s (A) early 1800s (N) late 1800s (U) 1895 (T) early 1900s (S) Today

Step 3: Once put in the correct order, the letters in the top corner of the slips will spell out the answer to the riddle at the front of the class, “A tasty treat, packed with power, below ground the fruit, above ground the flower. Peanuts!”

Processing Questions:

1. How did American’s view of peanuts change over time?
 - a. Listen for students to recall that peanuts were initially seen as food for the poor, but after the Civil War, were seen as tasty and nutrient-rich food.
2. Where are peanuts often eaten, and how are they viewed today?
 - a. Listen for students to identify community and sporting events, such as baseball games, as well as nutritious energy bars and snacks.

It’s A Fact!

Two peanut farmers have been elected president of the USA—Virginia’s Thomas Jefferson and Georgia’s Jimmy Carter.

Social Science: Peanut History Cards¹¹

— (P) —
European explorers first discovered
peanuts in Brazil.

— (E) —
Africans introduced peanuts to
North America.

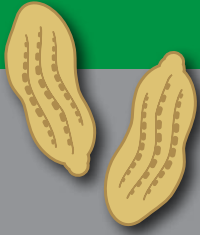
— (A) —
Peanuts were grown for the first
time in Virginia. At this time,
peanuts were considered food for
livestock and the poor.

— (N) —
Peanuts became popular in the
United States after the Civil War
when the soldiers realized they
liked them and they were a source
of protein.

— (U) —
Dr. John Harvey Kellogg developed
a version of peanut butter for his
older patients who couldn't chew
meat and needed a source of
protein.

— (T) —
Peanuts became a significant
agricultural crop in the United
States. Dr. George Washington
Carver was an inventor and scientist.
He saved agriculture in the South
by encouraging peanut production
when the boll weevil had destroyed
other crops.

— (S) —
Peanuts are considered the
12th most valuable cash crop in the
United States. Their farm value is
over one billion dollars.



Social Science



Where in the World?

Objectives:

Students will be able to:

- identify peanut-producing regions of the world.
- identify flow of peanut trade from U.S. to other regions in the world.

National Learning Standards:

National Social Studies and History Standards

- NSS-G.K-12.1: Understand how to use maps and other geographic representations, tools, and technologies to acquire, process, and report information from a spatial perspective.

Activity Description: Students will glue peanuts on a global map indicating major producing areas in the U.S. and to show the flow of peanuts and peanut products to other regions of the world.

Materials

- World map (one for each student)
- Peanuts, unshelled (about 20 peanuts per student)
- Glue
- Projector or large world map for reference

Activity Steps

Activity Prep: None

Step 1: Distribute world maps to students.

Step 2: Have students identify the 15 states in the U.S. where peanuts are commercially grown by lightly shading with a pencil. These states are Georgia, Texas, Alabama, North Carolina, Florida, Virginia, Oklahoma, New Mexico, South Carolina, Louisiana, Arizona, Arkansas, Mississippi, Missouri, and Tennessee.¹²

Step 3: Inform students that, while peanuts are grown in many warm regions around the world, the U.S. is a major exporter of peanuts. This means that the U.S. sends peanuts and peanut products to other countries.

Step 4: Using a large reference map, identify the major regions where the U.S. exports peanuts. Canada, Mexico, and countries in the European Union are locations where the U.S. exports peanuts. Have students note these areas by drawing an arrow from the U.S. and lightly shading with a pencil.

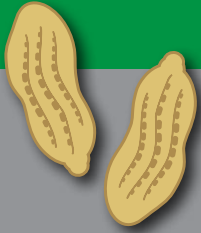
Step 5: Distribute peanuts and glue. Have students complete their maps by gluing peanuts on the shaded regions and along the export paths.

Processing Questions:

1. What is the difference between an export and import?
 - a. Listen for students to clarify that an export is something a country ships out, while an import is something the country brings in.
2. What factors might cause a country to export or import a commodity like peanuts?
 - a. Listen for students to describe that different regions of the world are suitable for growing different things. The southern U.S. is perfect for growing peanuts, so we are able to produce enough for our own consumption, and enough to sell to other countries who may not be able to grow their own.

It's A Fact!

Peanuts are grown in the warm areas of Asia, Africa, Australia, and North and South America.¹³



Social Science



George Washington Carver

Objectives:

Students will be able to:

- describe the discoveries and contributions made by George Washington Carver.
- illustrate the impact of these discoveries within the context of national historical events.

National Learning Standards:

National Social Studies and History Standards from the National Council for Social Studies

- NSS-USH.K-4.4: Understand major discoveries in science and technology, some of their social and economic effects, and the major scientists and inventors responsible for them.
- NA-VA.K-4.1: Students use different media, techniques, and processes to communicate ideas, experiences and stories.

Activity Description: Students will review key information about George Washington Carver and use this information to create an artistic representation of Carver's contributions to science and our nation. Students will illustrate an index card they can wear as a story-telling lanyard.

Materials

- 5x7 index card (1 per student)
- Peanuts (1 per student)
- Hot glue gun and glue (for adult use)
- Yarn (approximately 2' per student)
- Hole punch
- Coloring utensils
- Projector or printed copy of "Getting to Know George Washington Carver"

Activity Steps

Activity Prep:

- Prepare copies of "Getting to Know George Washington Carver" or plan to display it using a projector.

- Prepare one lanyard per student. Use a hole punch to put one hole in the top of a 5x7" index card. Cut one 2' section of yarn for each student.
- For more information check out the George Washington Carver video at www.biography.com.

Step 1: Hold up a peanut. Ask students to quickly brainstorm as many uses as they can think of for a peanut. Capture the list on the board.

Step 2: Introduce George Washington Carver as a man most famous for researching more than 300 products using the peanut! Reinforce the importance of Carver's research. He did not invent these just for fun! Carver developed new uses for the peanut crop as a way to help the south after the damage of the Civil War and cotton crop loss from pests.

Step 3: Display key information, or distribute copies, and walk students through the key moments in Carver's life. See "Getting to Know George Washington Carver" at the end of this activity.

Step 4: Distribute one, hole-punched index card to each student. Have students review the key information and select three to five key points about Carver's life to capture on the lined side of the cards.

Step 5: Instruct students to create an illustration on the blank side of the card that represents Carver's significant contributions to science and society.

Step 6: As students finish, glue one peanut in shell to the blank side of the card. *Note: Observe all recommended safety precautions for hot glue gun.

Step 7: Give each student a piece of yarn. Loop yarn through the hole in the card and tie to create a story-telling lanyard.

Step 8: Have students partner up and retell the story of

It's A Fact!

Carver's epitaph reads: "He could have added fortune to fame, but caring for neither, he found happiness and honor in being helpful to the world."¹⁴

Social Science: George Washington Carver (con't)

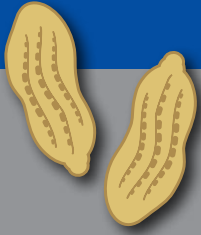
George Washington Carver, referencing their lanyard as needed.

Processing Questions:

1. What was George Washington Carver known for?
 - a. Listen for student to recall his contributions to science, botany, and his research for 300+ uses for the peanut, which transformed the economy of the southern United States.
2. What challenges may have prompted Carver to research uses of the peanut?
 - a. Listen for students to recall the destruction of the Civil War, devastation from the boll weevil infestation, and racial inequality.
3. What challenges do we face today and how might you help find a solution?
 - a. Answers will vary.

Getting to Know George Washington Carver¹⁵

- Carver was born as a slave in Diamond, Missouri during the Civil War, around 1864.
- He lived with Moses and Susan Carver after slavery ended. Susan taught George and his brother to read and write.
- Carver was sick as a young child so he could not work in the fields. He worked in the gardens and became known as the "Plant Doctor."
- He graduated from Minneapolis High School in Kansas.
- He was rejected from Highland College in Kansas because of his race, so he studied biology and geology at home.
- He was accepted to Simpson College, in Iowa, to study music and art.
- Because of his talent for drawing plants, he was the first African-American accepted to what is now Iowa State University.
- In 1892, a pest called the boll weevil ruined the cotton crop in the south.
- In 1896, he was hired to run the agriculture department at Tuskegee Institute in Alabama.
- Cotton farmers who lost their crop to the boll weevil started growing peanuts. Carver worked to help the farmers, and the southern U.S., recover.
- He became famous for his work in plant biology, developing new ways to use peanuts, sweet potatoes, soybeans, and pecans.
- Carver researched more than 300 uses for the peanut, including chili sauce, shampoo, shaving cream, and glue.
- Carver died in 1943.



Peanut Butter Positivity

Objectives:

Students will be able to:

- work in collaborative groups to discuss and plan a community service event using peanut butter.

National Learning Standards:

Common Core English Language Arts

- Speaking and Listening Standards K-5; Comprehension and Collaboration, 1: Engage effectively in a range of collaborative discussions with diverse partners on grade 3 topics and texts, building on others' ideas and expressing their own clearly.

Activity Description: Students will discover the nutritional value of peanut butter and its use as an aid tool for malnutrition. Students will work in collaborative groups to build on one another's ideas and create a community service plan to connect food pantries, and others in need, with peanut-based products.

Materials

- Jar of peanut butter
- Paper (1 per group)
- Colored pencils/markers (1 set per group)
- List of local food pantries and/or community service organizations

Activity Steps

Activity Prep: Research local food pantries and community service organizations in your area.

Step 1: Hold up a jar of peanut butter. Ask students what is in the jar. As students answer, push them to explain more. Listen for students to identify nutrients, including protein, necessary for healthy growth and development. Peanut butter also has long shelf-life, which allows it to be stored until needed by food service organizations.

Step 2: Using a projector, white board, or simple

explanation, share the key nutrients found in peanuts and peanut butter.

- Proteins are necessary for structure, function, and regulation of the body's cells, tissues and organs.
- Good fats help you feel full and store energy.
- Antioxidants help reduce the damage of oxygen in tissues.
- Fiber keeps your digestive tract healthy!
- Calories provide nutrient-rich energy for your body.

Step 3: Inform students that peanut butter is used to help people who are malnourished and hungry all around the world. In fact, peanut butter is one of the most sought-after foods at food pantries! Peanut butter is an excellent source of niacin and a good source of vitamin E and magnesium.¹⁶

Step 4: Inform students that they will work in groups to plan and execute a community service event involving peanut butter.

Step 5: Share examples of peanut-based community service events.

- March is National Peanut Month and November is National Peanut Butter Lovers Month. Take some time to prepare PB&J sandwiches for hungry families.
- Peanut Proud, a Georgia-based non-profit organization of the U.S. peanut industry, has donated 2.2 million jars of peanut butter since 2010.¹⁷
- Peanut butter is the number one requested item by food banks in the U.S. Host your own peanut butter drive in your community. Find the tools for a successful drive at: pb4h.org/get-involved/peanut-butter-drive-success-kit¹⁸

Step 6: Share a list of local food pantries and community service organizations as needed. Have groups work to outline a proposed event on the paper provided. After all concepts have been outlined, select a community service concept to pursue as a class!

It's A Fact!

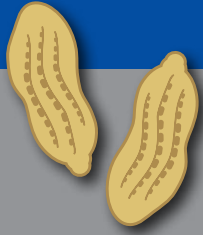
Peanut butter accounts for half of all peanuts eaten in the U.S.¹⁹

English Language Arts: Peanut Butter Positivity (con't)

Extension Opportunity: Explore the role peanut butter plays around the world to help save children in poor countries from malnutrition. To find out more, visit Peanut Butter for the Hungry <http://www.peanutbutterforthehungry.org>.

Processing Questions:

1. Why is peanut butter a valuable resource for the hungry in our community?
 - a. Listen for students to describe the nutritional benefits of peanut butter.
2. Consider the ideas our class generated. Which idea has the greatest potential to positively impact our community? What is our next step?
 - a. Answers will vary.



English Language Arts



Peanut Families

Objectives:

Students will be able to:

- listen to/read stories of families on peanut farms and recall key information.

National Learning Standards:

Common Core English Language Arts

- Reading Standards: Foundational Knowledge Grade 4, 3a: Know and apply grade-level phonics and word analysis skills in decoding words. Use combined knowledge of all letter-sound correspondences, syllabication patterns, and morphology (e.g., roots and affixes) to read accurately unfamiliar multisyllabic words in context and out of context.
- Speaking and Listening Standards Grade 4: 2.: Paraphrase portions of a text read aloud or information presented in diverse media and formats, including visually, quantitatively, and orally.

Activity Description: Three short non-fiction stories are provided about families that grow peanuts. After reading or listening to the stories, students will be asked to recall key information.

Materials

- Copies of "Our Family Peanut Story" (1 per student)
- Writing utensil or highlighter (1 per student)

Activity Steps

Activity Prep: Review non-fiction stories provided. Determine if students will benefit more from independent reading or listening to these stories.

Step 1: Inform students that there are 7,500 peanut farmers in the U.S. who work hard to care for the land and grow peanuts for people all around the world. Ask students to raise their hand if they have ever met a peanut farmer.

Step 2: Let students know that today they will get to meet a peanut farmer by experiencing their story! Distribute a copy of "Our Family Peanut Story" to each student. Preview new and key words as appropriate.

Step 3: Have students independently read or follow along while the teacher reads aloud. Students should highlight or underline key points in the story.

Step 4: After reading the three short stories, break students into groups of three. Ask one student in each group to become an expert on one of the stories by reviewing the key content.

Step 4: After reviewing, have each group select one member to be the first expert. The other two members of the group will be the interviewers. Have the expert turn his/her paper over. Prompt the interviewers to ask, "What do you recall about the story?" The expert should paraphrase the text to his/her best ability. Repeat the process for each member in the group. As an alternate accommodation, you may wish to have students write their paraphrased stories and submit.

Processing Questions:

1. What did all of the farmers have in common?
 - a. Listen for students to recall how the farmers care for the land, work hard, and take pride in providing a safe, quality product.
2. Based on these stories, how would you describe a peanut farmer?
 - a. Answers will vary.

It's A Fact!

99 percent of peanut farms are family-owned, small businesses averaging less than 180 acres.²⁰

Our Family Peanut Story

The Pope Family

Jeffrey and Stephanie Pope live in Drewryville, Virginia. Their 5,000-acre peanut farm has been in the family since the 1800's, for four generations. Jeffrey works hard to grow high quality peanuts. They only grow the world-famous Virginia jumbo peanut. After the peanuts are harvested, Stephanie leads a business cooking and coating the peanuts in delicious flavors. Royal Oak Peanuts is the name of their family business that packages and ships peanuts. Hope & Harmony Farms is the name of their specialty peanut business. Jeffrey, Stephanie and their children Mason and Avery work hard to love the land, respect their roots and give their best every day.



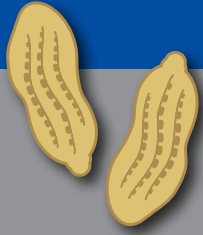
The White Family

Joe D. and Gayle White live in Tillman County, Oklahoma. On White Farm and Ranch they grow peanuts, cotton, corn, and wheat. They also have Angus cattle. Peanut farmers know how to work with the land by rotating crops. Each year, the Whites plant one of their crops in the field and they change the crop the next year. This helps the soil naturally gain more nutrients. Joe D. and Gayle know they must be diligent to care for the land and their crops. They pay attention to details very closely, to control pests and diseases, and help their plants grow.

The Martin Family

Christopher and Ginger Martin live in Hawkinsville, Georgia. Christopher went to college and had a dream of owning a farm. When Christopher was 27 years old, he had saved up enough money to buy his own farm. He started farming 555 acres of cotton, peanuts, and watermelons. Today, Christopher has more than 3,000 acres of cotton, peanuts, wheat, rye, and corn. He and his wife raised their son Grantson and daughter Wellsley on the farm. The children grew up plowing, planting, irrigating and caring for the land. The Martins work hard to conserve the land they live and work on. The Martins were selected as the National Outstanding Young Farmers. They earned this award by conserving soil and water and helping their community.





Peanut Classification

Objectives:

Students will be able to:

- identify the structures and functions that differentiate food items considered “nuts” (i.e., legumes, drupes, tree nuts).

National Learning Standards:

Next Generation Science Standards

- 4-LS1-1: Construct an argument that plants and animals have internal and external structures that function to support survival, growth, behavior, and reproduction.

Common Core English Language Arts

- Writing Standards K-5, 2: Write informative/explanatory texts to examine a topic and convey ideas and information clearly.

Activity Description: Students will look at actual samples of culinary nuts from different botanical classifications. Students will identify the structures that are similar and those that are different. As an extension, students will write a short explanatory article about the topic.

Materials

- Examples of botanical nuts (in their shell, if available): chestnuts, hazelnuts, or acorns
- Examples of botanical drupes (in their shell, if available): walnuts, almonds, pecans, cherries, peaches or plums
- Examples of legumes: beans, peas
- Peanuts in shell
- Labels: “Nuts”, “Drupes”, “Legumes”

Activity Steps

Activity Prep: Create large labels by folding three sheets of paper in half. Write one classification on each label: “Nuts”, “Drupes”, “Legumes”. Randomly set peanuts, botanical nuts, and drupe samples out on a central table. Keep legume samples hidden to start.

Step 1: Ask students to look at the samples on the table and ask for observations. Ask students what all of the items have in common. Listen for students to refer to all samples as “nuts.”

Step 2: Affirm student observations and bring out the “Nuts” label. Share with students that, we call all of these items nuts based on how we consume them. “Nuts” is the correct culinary definition of these items.

Step 3: Share with students that there is also a botanical definition. A botanical definition refers to the structure of the plant that provides the food we eat. Shift samples into three groups, bringing out the legume samples and additional labels.²¹ Display pictures of nuts, drupes, and legumes using this resource or a projector.

Step 4: Give each student a piece of paper and coloring utensils. Allow students to pick up a sample nut, drupe, or legume and illustrate on his/her paper. Students should label fruit (on nuts and drupes), shell or pod, and seeds.

Step 5: Have students write a short summary clarifying the botanical classification of these food items.

Step 6: Remind students that all culinary nuts are a delicious and nutritious food choice. Nuts can be a great component to meals, and snacking, morning, noon, and night.




Processing Questions:

1. What is the difference between a culinary definition and a botanical definition?
 - a. Listen for students to share that a culinary definition refers to how we consume a food, while the botanical definition refers to the plant on which it grows.
2. What are the main parts of the plant that determine the botanical definition?
 - a. Listen for students to identify fruit, seed and pod, or shell.

It's A Fact!

Plant based protein, like peanuts, do not contain cholesterol and are low in saturated fat.²²

English Language Arts: Peanut Classification (con't)

		
Nuts	Drupes	Legumes
Examples: chestnuts, hazelnuts, or acorns	Examples: walnuts, almonds, pecans, cherries, peaches, or plums	Examples: peanuts, beans, peas
Structure: hard-shelled pod that contains the fruit and seed of the plant. Chestnuts and hazelnuts are fruit and seed together!	Structure: fleshy fruit surrounds a shell with a seed inside. Walnuts, almonds and pecans are actually seeds! We often don't see the fruit from a walnut, which is used in things like animal feed.	Structure: seeds are grown in long cases called pods. Peanuts, beans, and peas are actually seeds. Legumes are great because they add nitrogen back into the soil!

¹ Agriculture Marketing Resource Center. (2020) Peanuts Retrieved from <https://www.agmrc.org/commodities-products/nuts/peanut-profile>.

² U.S. Department of Agriculture, Agricultural Research Center. (2010). U.S. crop analysis provided by Marshall Lamb, Ph. D., Research Leader, USDA-ARS [Peer Commentary on the paper "The green, blue and grey water footprint of crops and derived crop products" by M. M. Mekonnen, and A. Y. Hoekstra UNES-CO-IHE, Delft, the Netherlands].

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⁶ Food Allergy and Anaphylaxis Connection Team. (2015). Food Allergy Awareness Resources. Retrieved from Food Allergy and Anaphylaxis Connection Team website: http://www.foodallergyawareness.org/education/food_allergy_aware-ness_resources-12/

⁷ Mayo Clinic. (2014). Food allergy. Retrieved from Mayo Clinic website: <http://www.mayoclinic.org/diseases-conditions/food-allergy/basics/symptoms/con-20019293>

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¹⁰ National Peanut Board. (2020). Comparing Nuts. Retrieved from National Peanut Board: <https://www.nationalpeanutboard.org/peanut-info/comparing-nuts.htm>

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¹³ National Peanut Board. (2015). Peanut country USA. Retrieved from National Peanut Board: <https://www.nationalpeanutboard.org/peanut-info/peanut-country-usa.htm>

¹⁴ Bio.com. (2015). George Washington Carver. Retrieved from <http://www.biography.com/people/george-washington-carver-9240299>

¹⁵ Bio.com. (2015). George Washington Carver. Retrieved from <http://www.biography.com/people/george-washington-carver-9240299>

¹⁶ National Peanut Board. (2019). Peanut Nutrition 101. Retrieved from National Peanut Board: <https://www.nationalpeanutboard.org/wellness/peanut-nutrition.html>

¹⁷ Peanut Proud. (2020) About. Retrieved from Peanut Proud, Inc.: <http://www.peanutproud.com>

¹⁸ Peanut Butter for the Hungry. (2020). Get Involved. Retrieved from: pb4h.org/get-involved/peanut-butter-drive-success-kit

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²¹ Zalban, L. (2010, April). Nuts vs. drupes: What's the difference? Serious Eats. Retrieved from <http://www.serious-eats.com/2010/04/what-are-the-differences-between-nuts-and-drupes.html>

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