LESSON

Potatoes: More Than Fries

Students investigate potato varieties, explore potato plants, determine how potatoes grow, and make a potato recipe.

GRADES	ESTIMATED TIME	UPDATED
K – 2	50 minutes	October 26, 2023

Background

Materials Needed

Engage:

- 5-6 different potatoes (i.e., gold, russet, red, sweet potato, fingerling, yellow, purple)
- Bag for potatoes
- Cutting board
- Knife

Activity 1: Growing Potatoes

- Potatoes (https://youtu.be/p1KyzjEK46Y) video
- Potato
- Potato growing supplies
  - Seed potatoes (one piece with an eye for each student)
  - Plastic cups (1 for each student)
  - Potting soil
  - Permanent markers
  - Scissors
  - Tray for cups

Activity 2: Potato Plant

- Potato Plant Diagram (https://cdn.agclassroom.org/media/uploads/LP849/potato_diagram.pdf)
- 2 chairs

Activity 3: Eating Potatoes

- Cooking supplies:
  - Cutting board
  - Knife
  - Electric frying pan
  - Spatula
  - Small paper plates
- Ingredients:
  - Gold or yellow potatoes (about 1 for 4 students)
  - Dried oregano
  - Salt
  - Water
- Potato Song Sheet (https://cdn.agclassroom.org/media/uploads/LP849/potato_song_sheet.pdf)

Vocabulary

potato eyes
sprouts on a potato from which new potatoes can grow

seed potato
a potato tuber grown for its buds which are used to start new plants

tuber
a thickened underground portion of a stem or rhizome which bears buds

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Did You Know?

- Russet potatoes are the most commonly used variety of potato in the United States. They are brown in color and are used to make commercial French fries.[1]
- If a potato plant flowers and is pollinated, it produces a fruit that resembles a green cherry tomato. But don't eat it! The fruit contains a high amount of solanine and is toxic.[2]
- In 1995, potato plants were taken into space with the space shuttle Columbia. This marked the first time any food was ever grown in space.[3]

Background Agricultural Connections

There are two general groups of potatoes—Irish potatoes and sweet potatoes:

- The Irish potato is one name for what we typically call a potato. It comes in many varieties, sizes, and colors.
- Sweet potatoes are a distinctly different food. We sometimes call sweet potatoes "yams," but this word is better used for another food commonly grown in other parts of the world.

For both of these types of potatoes, we thank the Native peoples of the Americas. The Irish potato was made popular in the US by immigrants from Ireland. However, it was originally grown in the highlands of the Andes. The sweet potato was first cultivated in Central America.

The potato is not a root but a storage area that is part of the plant's underground stem. Vigorous potato plants that have plenty of sunlight, water, and nutrients from the soil produce more energy than the growing plant can use at one time. The plant stores the excess energy in oval packages, called **tubers** (the potatoes). These tubers provide the plant energy to regrow in the spring. When the greenery starts to wither and turn brown, the potatoes are ready to harvest.

After they are harvested, potatoes can be stored for 2-3 months and will remain in a dormant state if kept in a cool, dark location. When moved to a warmer place, the potatoes will begin to sprout in one to three weeks. Sprouts grow from the **eyes** of the potato, which are actually nodes on this enlarged, underground stem. Each node is capable of developing into a branch that can grow up through the soil and emerge into a green, leafy shoot. As the branches grow, they use up the energy from the original seed potato, which will shrink and shrivel as its starch is consumed. Soon the branches of the plant will grow bushy and have many new leaves that all produce energy through photosynthesis. At this point, new potatoes will begin to form on the underground sections of the branches that grew upward from the seed potato.

Potatoes produce more pounds of protein per acre than corn, rice, wheat, or oats. They are packed with nutrients, low in fat, generous in bulk, and efficiently packaged in their own skins. They can be prepared in many different ways and are delicious.

Lesson Activities

Engage

1. One at a time, take each potato out of the bag. Ask students:
    - What are all of these? *(Potatoes)*

- What do you notice about these potatoes? *(They are spherical, have eyes, are different colors, etc.)*
- What else do you know about potatoes? *(They grow underground, they can be mashed or made into French fries or potato chips, etc.)*
- What do you wonder about potatoes?

2. Dissect potatoes by cutting several potatoes (purple, gold, and orange sweet potatoes are especially exciting) in half and give sections to the students (individuals or groups). Ask the students to inspect the potato section(s) and share what they see.
3. Tell the students that they will be investigating and learning more about potatoes in this lesson.

Explore and Explain

ACTIVITY 1: GROWING POTATOES

1. Have the students watch the Potatoes (https://youtu.be/p1KyzjEK46Y) (4:11) video. Ask the students to watch and listen for one thing they already knew about potatoes and two things they didn't know about potatoes. Allow time for the students to share after viewing the video.
2. If a student doesn't mention that potatoes are most often not grown from seeds, share this fact with them—most potatoes are actually grown from potato pieces called "seed potatoes."
3. Show the students the eyes on a potato. Explain that each seed potato has an eye. New growth or sprouts grow from the eyes and will grow into potato plants.
4. Grow potato plants:
    a. Cut potatoes into four pieces, with an eye on each piece.
    b. Give each student a large plastic cup. Use permanent markers to label each cup with the student's name. Use scissors to cut small holes in the bottom of the cup.
    c. Each student fills their cup with soil.
    d. Pass out potato pieces and tell students to put them halfway down the cup. The potato piece (seed potato) should be completely covered with soil.
    e. Place the cups, labeled by name, on trays and place in a warm place like a windowsill.
    f. The cups should be watered until water is dripping out of the bottom of the cup.
    g. After a few days, the students can dig up their seed potato and observe, record, and make predictions. This can be done every few days for one or more weeks.
    h. When potato shoots/plants start coming above the soil, the students should take the cups home for replanting in a larger container or garden space.

5. Discuss with the students what the potato plants need to survive and produce potatoes for us to eat. *(Air, light, water, and nutrients)*

ACTIVITY 2: POTATO PLANT

1. Hand out the Potato Plant Diagram (https://cdn.agclassroom.org/media/uploads/LP849/potato_diagram.pdf) and assist the students in labeling the flower, leaves, stem, roots, and tubers. Help students describe the job of each potato plant part:
   - **Flower:** location in which pollination takes place and seeds are produced
   - **Leaves:** soaks up the sun's energy and makes food for the plant
   - **Stem:** transports water and food to other parts of the plant
   - **Roots:** anchor the plant and absorb water and nutrients
   - **Tuber:** special part of potato plants (and a few other plants) that stores food; the part of the potato plant that we eat
2. Tell the students that together they will act out the parts of a potato plant. They will need to be quiet and still actors that freeze in their positions:
   a. Start with two chairs. Everything below the chairs represents underground.
   b. Pick one student to represent the seed potato and have them curl up on the floor between the two chairs.
   c. Pick two students to represent the stems and leaves. Have them sit on the chairs, put their arms in the air, and make leaf shapes with their hands.
   d. Pick three students to represent the roots. Have them lie flat on their backs on the ground, radiating away from the seed potato.
   e. Have three students curl up on their side to represent potatoes amongst the roots.
   f. When everyone is in place, have the remaining students point to each part of the plant as you say its name.
   g. Thank the potato plant actors and ask them to return to their chairs.
3. As a class, discuss how the potato plant parts work together to produce a delicious and nutritious vegetable for us to eat.

ACTIVITY 3: EATING POTATOES

1. Ask the students to think of all the ways they can eat potatoes (mashed, French fries, tator tots, potato chips, etc.). Explain to the students that they are going to follow a recipe to make Golden Oregano Potatoes.
2. Show the students the equipment and ingredients (cutting board, knife, electric skillet, spatula, potatoes, water, salt, and oregano).

3 Discuss how the potatoes will be prepared to be cooked. Explain that the potatoes must be cleaned and scrubbed (it is recommended to have the potatoes pre-scrubbed). The potato skin should be kept on. Potato skin is good for us because it contains vitamins, minerals, and fiber. Cut the potatoes in 1/4" slices (one slice per student, plus a few extras).

4 Begin cooking by placing the slices into an even layer on the electric skillet. Sprinkle the bottom layer with oregano and salt and cover the bottom layer only with water. Repeat (except for the water) for a second layer. Cook for 10-15 minutes. Water may need to be added. The potatoes are done when a knife easily slides through a slice. Serve slices on small plates with a fork.

5 While the potatoes are cooking, lead the students in the easy-to-learn Potato Song (https://cdn.agclassroom.org/media/uploads/LP849/potato_song_sheet.pdf). This song is about eating a different potato dish every day of the week. Students can add their own ideas about what to cook. To hear the song, watch The Potato Song (https://youtu.be/MpySWPTsRmg) video.

6 Tell the students, "We eat a lot of potatoes today but in the old days, potatoes were so important for some families they would eat them almost every day—especially during the winter. Today we will learn a song about that time."

7 Teach the refrain first:
We all like to eat potatoes, eat potatoes, eat potatoes.
We all like to eat potatoes, eat them when they're hot. (On the word "hot," students clap.)

8 Teach the first verse, which is about Sunday to Wednesday:
Sundays we'll have baked potatoes,
Mondays we'll have stew.
Tuesdays we'll have mashed potatoes,
Wednesdays we'll have soup. (To remember each dish, teach a motion to go along with each day. For example, hold a hot potato for Sunday, or bring a spoon to your mouth for Wednesday.)

9 Generate three more ideas with the class for verse 2:
Thursday we'll have _____,
Fridays we'll have _____,
Saturdays we'll have _____,
Then we start all over.

10 Sing the whole song:
Refrain
Verse 1
Refrain
Verse 2
Refrain

This lesson investigates potatoes. If you teach in the following state, refer to your local agricultural literacy resources about potatoes.

- Maine (https://teachmefoodandfarms.org/potatoesmebook/)

Elaborate

- Make potato stamps:
  - Cut potatoes in half.
  - Have students create simple designs to carve into the meat of the potato (e.g., star, heart, circle).
  - Help students carve the designs in the potatoes using plastic knives.
  - Mix water-based paints in aluminum pie pans or other shallow dishes.
  - Instruct students to dip the potato surface into the paint, press to the surface of the paper, and carefully lift the potato, leaving the print on the paper.
- Have the students weigh different sizes of potatoes using scales and compare the weights to various classroom materials (bottle of glue, linking cubes, etc.). Then instruct the students to write sentences to show their results (e.g., My potato is lighter than _____. My potato is heavier than _____.)
- View the Potato: How Does it Grow? (https://youtu.be/lkJ0aJNzf1g) video to learn more about how potatoes are grown and harvested.

Evaluate

After conducting these activities, review and summarize the following key concepts:

- Most potatoes are grown from potato pieces called "seed potatoes."
- Each seed potato has an eye. New growth or sprouts grow from the eyes and will grow into potato plants.
- Potato plants need to air, light, water, and nutrients to survive and produce potatoes for us to eat.
- Potato plants have flowers, leaves, stems, roots, and tubers. Tubers are the part of potato plant that stores food and are the part of the potato plant that we eat.
- You can eat potatoes mashed, baked, or fried. French fries, tator tots, and potato chips are made from potatoes.

Recommended Companion Resources

- Book • George Crum and the Saratoga Chip (https://agclassroom.org/matrix/companion-resources/1063/)
- Book • Mr. Crum's Potato Predicament (https://agclassroom.org/matrix/companion-resources/1176/)
- Book • No Small Potatoes: Junius G. Groves and His Kingdom in Kansas (https://agclassroom.org/matrix/companion-resources/913/)
- Book • Oliver's Vegetables (https://agclassroom.org/matrix/companion-resources/457/)
- Book • Potatoes for Pirate Pearl (https://agclassroom.org/matrix/companion-resources/1282/)
- Book • The Life of a Potato (https://agclassroom.org/matrix/companion-resources/1091/)
- Book • Two Old Potatoes and Me (https://agclassroom.org/matrix/companion-resources/1061/)
- Booklet/Reader • Sweetpotato Ag Mag (https://agclassroom.org/matrix/companion-resources/1044/)
- Movie/Video • George the Farmer (https://agclassroom.org/matrix/companion-resources/1147/)
- Movie/Video • How Does it Grow? Video Series (https://agclassroom.org/matrix/companion-resources/472/)

Credits

Author

Uli Koester | Midwest Food Connection

Acknowledgements

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Sources

1. https://potatogoodness.com/potato-basics-week-wondering-which-potato-variety-to-use/ (https://potatogoodness.com/potato-basics-week-wondering-which-potato-variety-to-use/)
2. https://www.canr.msu.edu/news/what_are_those_fruit_growing_on_my_potato_plants (https://www.canr.msu.edu/news/what_are_those_fruit_growing_on_my_potato_plants)
3. https://mobile-cuisine.com/did-you-know/potato-fun-facts/ (https://mobile-cuisine.com/did-you-know/potato-fun-facts/)

National Agriculture in the Classroom provides K-12 educators with engaging resources to increase agricultural literacy among their students.

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