

Lesson Plan - Digital Toolkit

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| <p><u>Title:</u> "The Great Potato Challenge"</p> | <p><u>Grade Level:</u> 3rd -5th Grade</p> |
| <p><u>Challenge Question:</u> What can potatoes teach me about soil and how it interacts with living and nonliving things?</p> | |
| <p><u>Engage:</u> Students will be studying the life cycle of a potato. They will be able to observe the growth patterns for a potato planted in soil, a potato not planted in soil, and a potato grown hydroponically. Students will be able to discuss and fill out a "Potato Journal" to highlight all their findings!</p> | |
| <p><u>Explore:</u> Have each student create their own "<u>Potato Journal</u>". They will use this journal to document their observations of the potatoes at regular intervals (once a week). You can have our example journal printed or create your own!</p> | |
| <p><u>Challenge Timeframe:</u> September 11, 2023 - March 15, 2024</p> <p>Challenge will take you roughly <u>8 weeks</u> to complete. Averaging 30-45 minutes of required work each week. You can choose anytime in the Challenge Timeframe to start and finish your project!</p> | |
| <p><u>Materials Needed:</u></p> <ul style="list-style-type: none"> • Georgia Ag Experience: Potato Journal (LINK) • 2 Large Potatoes, 1 Small Potato • Paper Plate • Large pot or container (at least 12" deep and 12" wide with drainage holes) • Potting soil • Lamp or lights (will need to be positioned to shine closely and directly on the growing potato) • Watering can or pitcher • 4 Toothpicks • 1 Clear plastic cup | |

Next Steps:

Potato With No Soil

1. Place one of the large potatoes on a paper plate in a location where students can easily make observations.
2. Ask students to examine the potato and describe it on the first page of their journals. They can also draw what they see.
3. Ask students if they think the potato is living or nonliving. Discuss the characteristics of living and nonliving things.
4. Explain to students that they will observe the potato to find the number of days that pass before the eyes begin to sprout. In 2-3 weeks you should see many sprouts!

Potato With Soil

1. Place one of the large potatoes in a large container or pot.
2. Fill the pot approximately 1/4 full of potting soil. Place the potato on top of the soil and cover with 3-4 inches of soil or until the pot is about half full.
3. Position lamp or light to shine on pot. Water lightly. Too much water could cause potato to rot.
4. Have students examine the potato in the soil and describe it on the first page of their journal. They can also draw what they see.
5. As shoots appear and get tall, cover them with more soil, and tie them to a stake. When flowers start to appear, stop watering to prevent the potatoes from rotting.
6. After 6-8 weeks, when the potato plant has finished flowering or the top starts to die, harvest the potatoes by gently pulling the plant out of the pot. Lay the plant on newspaper. Have students sift through the dirt to find any potatoes left behind in the pot.

Hydroponic Potato

1. Place 4 toothpicks on opposite sides of a small potato. Potato needs to be small enough to fit in cup.
2. Insert the wide end of the potato into the clear plastic cup so the toothpicks rest on the rim of the cup. Add enough water to the cup to cover just the bottom of the potato.
3. Place the cup with the water and potato in a dark, cool place. Leave it there for 1-2 weeks to allow the eyes and sprouts to grow.
4. Have students examine the potato and describe it on the first page of their journal. They can also draw what they see.
5. Once sprouts start to grow, put the potato in the cup near a sunny window. You should see shoots and growing roots. Allow the potato to continue growing, adding water when needed.



(Optional): Try planting the potatoes that have sprouted in the "No Soil" and "Hydroponic" experiment in a separate container.

See how many potatoes they can grow compared to the "With Soil" potato!



Reflection:

1. Potatoes are living things that depend on nonliving things, like sunlight and soil nutrients to grow.
2. What are the differences that students observe between growing a potato with soil, without soil, and hydroponically?
3. Discuss the importance of soil to plants as an example of the interaction between living and nonliving things. Ask students if they can think of any other nonliving things that affect plants (e.g., light, water, temperature).

Georgia Standards of Excellence:

S3L1, S3P1, ELAGSE3W3, ELAGSE3W10,
S4L1, ELAGSE4W3, ELAGSE4W7, S5L3,
S5L4, ELAGSE5W2, ELAGSE5W3

Georgia Elem Ag Ed Standards:

3NRS1, 3NRS3, 5NRS2, 3LCR1,
3LCR3, 4LCR1, 3FA1

Additional Resources

| Videos / Activities: | Book Suggestions: |
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| <p><u>"Powerful Potato" - NAITC Matrix</u></p> <p><u>How to Grow Potatoes in Water</u></p> <p><u>How to Grow a Potato in Water for a Science Project</u></p> <p><u>Potato How Does It Grow?</u></p> <p><u>Grow Your Own Potatoes!</u></p> <p><u>Potato Diagram</u></p> | <p><u>"Potatoes for Pirate Pearl"</u></p> <p><u>"No Small Potatoes: Junius G. Groves and His Kingdom in Kansas"</u></p> <p><u>"Mr. Crum's Potato Predicament"</u></p> <p><u>"The Life of a Potato"</u></p> <p><u>"My Life as a Potato"</u></p> <p><u>"The Vibrant Variety"</u></p> <p>This is a FREE printable chapter book. If you are unable to print this book for every students contact your local Farm Bureau and ask them to help you get it printed.</p> |
| Community Partner Suggestions: | Agricultural Career Connections: |
| <p><u>County Farm Bureau Office</u></p> <p><u>UGA Extension Office</u></p> <p><u>USDA Natural Resources Conservation Services</u></p> <p><u>Georgia Master Gardeners</u></p> | <p><u>Extension Agent</u></p> <p><u>Agricultural Teacher</u></p> <p><u>Agronomist</u></p> <p><u>Farm Manager</u></p> <p><u>Irrigation Supervisor</u></p> <p><u>Hydroponic Specialist</u></p> <p><u>Vermiculturist</u></p> |



Rubric

| Category | Description | Points |
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| Time Requirement | The video must be no longer than 5 minutes. | Up to 5 minutes - 5 points Over 6 minutes - 4 points Over 7 minutes - 3 points Over 8 minutes - 2 points Over 9 minutes - 1 point |
| Delivery | Student's voices and video quality were clear and at an appropriate volume. | 15 points |
| Orderly Progress | Video flows from beginning to end with a clear introduction, main points, and conclusion. | 20 points |
| Researched Information / Coverage of Subject | Video demonstrates knowledge of how potatoes can teach you about soil and how it interacts with living and nonliving things. | 20 points |
| Creativity | Get creative with your video! We want to see more than just your students reading off a paper. This could include video editing, artistic elements, out of the box thinking, acting, costumes, storytelling narration, text overlays, animations, visuals, audience engagement, and showcasing curiosity. | 20 points |
| Supportive Materials | Video must include at least 5 photos or video clips of students throughout the challenge process. | 20 points |
| TOTAL | | 100 Points |
| Bonus Points | Ask an expert! Contact a community partner. If you are having trouble connecting with a community partner, please contact us for help! info@georgiaagexperience.org | 2 extra points for every community partner contacted. |