SPROUTS' MONTHLY BOOK

SC Farm Bureau
Ag in the Classroom
P.O. Box 754
Columbia, SC 29202
803.936.4237

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www.SCFB.org/aitc

October Monthly Book
The Great Pumpkin Smash
Written by Lori Haskins Houran
Illustrated by Maarten Lenoir
Grade Levels: K-8
Google Slides: Click Here

SCAN ME

Book Summary:
The Great Pumpkin Smash is a book about agriculture (composting) and engineering. “For Luke, autumn in Florida feels weird. There are no changing leaves, no cider, and worst of all, no pumpkin chucking! But maybe Luke can engineer a way to bring some pumpkin spice to the south.” The Makers Make It Work series offers fun and easy-to-read stories that focus on problem-solving and hands-on action.

Purpose:

Did You Know? (Ag Facts)

- Illinois is the top pumpkin producing state in the nation with nearly 500 million pounds of pumpkins harvested each year.
- The size of a pumpkin depends on water, temperature, insects, diseases, pollination, fertility, soil type, plant population and weeds.
- Pumpkins are ready to harvest when they are the right color and have the right rind readiness. However, remember, they can be many different colors.
- It takes about four months for a pumpkin to grow full size.
- Pumpkin seeds are a great source of Vitamin A.
- Pumpkins are a member of the gourd family which includes honeydew melons, cucumbers, watermelons, and zucchini.

Discussion Questions

- What is agriculture?
- What is engineering?
- What did you learn about pumpkins from the story?
- What did you learn about engineering from the story?
- What causes the pumpkin to change?

Background Agricultural Connections:

The **pumpkin** is one of only a few foods native to North America that is still eaten today. Native Americans used pumpkins for food and medicine. Dried pumpkin shells served as bowls or containers for storing grains and seeds. Flattened strips of pumpkin were dried and made into mats.

Pumpkins were a main part of the Pilgrims' daily diet. If left uncut and stored in a cool, dry place, pumpkins can keep for several months. Colonists made pumpkin pies by slicing off pumpkin tops, removing the seeds, filling the pumpkin with milk, spices, and honey, and then baking it all in hot ashes.

Today, the majority of pumpkins grown are sold for decorating and carving. The tradition of carving pumpkins at Halloween started with the Irish. The original jack-o-lanterns were made from turnips. When the Irish immigrated to the US, they found that pumpkins were in large supply and were much easier to carve.

The pumpkin is a member of the cucurbit family which includes gourds, squash, cucumbers, and melons. Pumpkins come in a variety of shapes, sizes, and colors. Most pumpkins are orange,

but they can also be yellow, red, white, gray, or pale green. Pumpkins range in size from less than a pound to over 2,000 pounds.

A pumpkin is a fruit that grows on a vine. They are typically planted in late spring or early summer for an October harvest. After a pumpkin seed sprouts, large leaves begin to grow on vines. Eventually, the vine blooms with yellow flowers. Following pollination, the female flower begins to grow a small green pumpkin that will turn orange as it continues to grow. When the vines turn brown, the pumpkins are ready to harvest.

Pumpkins left in the field will be eaten by animals or they will decompose. The phenomenon of **decomposition** is a natural process through which nutrients are recycled back into the soil. Insects, **fungus**, and **bacteria** are decomposers that eat the dead tissue from the pumpkin and excrete it in a form that helps live plants grow.

In nature, dead plants and animals decompose and become humus. Humus acts like a sponge to help soil hold water. It also traps air in the soil and provides nutrients. Plants need air, water, light, and nutrients to grow. When farmers plant crops in the soil, the growing crops take out nutrients. The farmers can replace those nutrients by tilling decomposing plants back into the soil. The surviving seeds left by a decomposing pumpkin have the ability to sprout and grow into a new pumpkin plant, continuing the pumpkin life cycle.

Vocabulary

1. **Engineering:** the process of creating and building structures, products, and systems by using math and science.
2. **Engineers:** design and build things such as toys, phones, cars, bridges, tractors, and more.
3. **bacteria:** a group of single-celled living things that cannot be seen without a microscope that reproduce rapidly and sometimes cause diseases
4. **decomposer:** an organism that feeds on and breaks down dead plant or animal matter
5. **decomposition:** the breakdown of plant or animal matter, the process of decay
6. **fungus:** any one of a group of living things (such as molds, mushrooms, or yeasts) that often look like plants but have no flowers and that live on dead and decaying things
7. **humus:** a brown or black material in soil that is formed when plants and animals decay
8. **nutrient:** a substance that plants, animals, and people need to live and grow
9. **pumpkin:** a large, rounded fruit with a thick rind, edible flesh, and many seeds
10. **Pulp:** the soft, squishy parts inside a fruit vegetable
11. **Stem:** the part of a plant that a fruit, vegetable, or flower grows.
12. **Seed:** the life holder, with plenty of water, sunlight, air, and rich soil, the pumpkin seed grows into a pumpkin vine.
13. **Vine:** long flexible stem that grows along the ground where the blossom and leaves grow (and eventually, the pumpkin will grow on it, too).
14. **Blossom:** a female flower that gets pollinated by insects will begin the

start of the growing pumpkin.

15. **Pollination:** the transfer of pollen from the male anther to the female stigma.
16. **Mature Pumpkin:** pumpkins that are finished growing and have a hard rind.

Pumpkins and Natural Resources

1.Crops, like pumpkins, and livestock animals grow best when they get just the right amount of FOUR things that we get naturally on our Earth. What four natural resources do plants and animals need to grow?

2. How do we use pumpkins?

- Decorating: For seasonal and holiday use, like Halloween or Thanksgiving.
- Eating: Do you like pumpkin pie?
    - Pets and livestock animals enjoy eating pumpkins.
- Composting
    - Instead of throwing your pumpkin in the trash, compost it!
    - After about 8-12 weeks in your compost, the pumpkin will start to break down.
    - It then returns to the soil and helps fertilize new plants.

Engineering with Agriculture

Materials: popsicle sticks, rubber bands, plastic spoons, tape on the floor for target lines, small pumpkin shaped candy, cotton ball, crumpled paper

1. Students will work in groups or pairs to create a catapult to launch various items. The catapult can be built to their creativity..
    a. Make a stack of 7 popsicle sticks and use rubber bands to tie them together on both ends.
    b. Make a stack of 2 popsicle sticks and use a rubber band to tie them together on one end only.
    c. Pull the 2 popsicle sticks apart and wedge the story of 7 popsicle sticks between them.
    d. Use 2 rubber bands, secure the plastic spoon to the upper popsicle stick.
    e. Place the launching object onto the spoon. Hold the catapult with one hand, use the other hand to push down on the spoon.
    f. Release the spoon and watch!
2. This is a great time to talk about potential energy (energy that is stored up and ready for use) and kinetic energy (energy that is in motion and being used.)
3. Allow each group to line up to test their catapult from behind the initial launch line. Students will launch all 3 items (pumpkin candy, cotton ball, and crumbled paper). Mark the distance and record the data to make a bar graph.
4. After everyone has launched, talk with students about how they could make their catapult better, stronger, or launch farther.

Pumpkin Processing

Materials:

- Pumpkin Pie in a Bag materials (see attached sheet)
- Libby's 100% Pure Pumpkin From Farm to Can video

Procedures:

1. Brainstorm with the class all of the uses for pumpkins. In addition to carving for Halloween, pumpkins are also processed into various food products such as pumpkin pie, pumpkin cheesecake, and more. In fact, the majority of pumpkins grown in the United States are processed into pumpkin puree that is typically canned.

2. Explain to students the difference between a whole, raw food product (like a pumpkin) and a processed food product, such as pumpkin pie or any other food product made from pumpkin. Use the following diagram:

3. Show the Youtube video clip Libby's 100% Pure Pumpkin From Farm to Can. This video shows the pumpkin in a farmer's field, planting, harvest, and processing.

4. Use the instructions found in the attached file Pumpkin Pie in a Bag to make pumpkin "pies" for your students.

Decomposing Pumpkin

Materials: small pumpkin, large plastic or glass container with lid, potting soil, clear packing tape, knife, water

1. Take the large plastic container and cut a hole large enough to fit your small pumpkin through. Save that piece. Add several inches of planting soil to the bottom of the container and spritz with water until damp. Do not saturate the soil. Place the pumpkin in the container and replace the top of the container. You may need to use packaging tape to fasten it in

place.

2. Your pumpkin will need warmth and water in order to decompose. The warmer the air and soil get in the container, the faster your pumpkin will rot. Place the container in a warm area of your classroom and leave it be. Don't open it unless you absolutely have to. Opening it will allow the warm air and moisture to escape from it... which will make it take longer for the pumpkin to decompose.
3. Throughout the autumn and winter, you will see the pumpkin go through the phases of decomposition. Fungus will grow on it and spread to the soil. As the fungus decomposes the pumpkin, the pumpkin will change colors, shrink, and eventually disintegrate into the soil.
4. Once the pumpkin has disintegrated into the soil, it's time to open the container and let the fresh air in. (May I suggest doing this outside? This will be really smelly!) Cover the remains of the pumpkin and the seeds with planting soil. Spritz the soil with water until it's damp, replace the top, and wait. In a week or so, you should see little seedlings emerge!
5. After you see seedlings begin to emerge, you can remove and discard the top of the container. Keep the container in a sunny window so the seedlings can grow. Water the seedlings as needed and watch your seedlings become mature plants!
6. Eventually, the pumpkin plants will outgrow the container they're in and will need to be transplanted. Depending on the type of pumpkin you used for this activity, its vines can grow up to 20 feet long! Carefully remove the plants from the container and transplant them into the ground... far away from the playground... or to a raised garden bed. Continue to water and care for the plants as needed. Depending on when your school year ends, you may be lucky enough to see some yellow blossom on the plants.

Additional Resources

- https://www.scfb.org/sites/default/files/AITC%20Book%20of%20the%20month/10%20October%2019%20Lesson%20Plan.pdf
- https://www.scfb.org/sites/default/files/AITC%20Book%20of%20the%20month/2021/10%20October%20Lesson%20Plan%202021.pdf
- The Physics of “Punkin Chunckin” https://www.youtube.com/watch?v=sXuQvAPwcOE • Decomposing Pumpkin – Timelapse https://www.youtube.com/watch?v=LWF828lfARQ
- Pumpkin Facts http://www.history.com/topics/halloween/pumpkin-facts •
- “No Water, No Food” (2021 Interview - News KOB4) Pumpkin & Chile Farmers in Corrales, NM https://www.kob.com/archive/farmers-concerned-about-droughtconditions/?utm_source=New+Mexico+Farm+%26+Livestock+Bureau&utm_medium=Email&utm_campaign=we bsite
- Pumpkin Capitol of the World – Libby’s 100% Pure Pumpkin From Farm to Can. https://www.youtube.com/watch?v=Hft-zbqxeLM
- Pumpkins...Not Just for Halloween (k-2)https://newmexico.agclassroom.org/matrix/lesson/545/
- A Case of the Missing Pumpkin (k-2) https://newmexico.agclassroom.org/matrix/lesson/623/
- Storing Winter Squash (k-2) https://newmexico.agclassroom.org/matrix/lesson/824/
- Pumpkins...Not Just for Halloween (3-5)https://newmexico.agclassroom.org/matrix/lesson/131/
- 3 Sisters (3-5) https://newmexico.agclassroom.org/matrix/lesson/297/

References

- New Mexico Ag in the Classroom
- SC Ag in the Classroom
- Kelly's Classroom Online