



**2024 BOOK OF THE YEAR
EDUCATOR GUIDE**

CORN COB TOYS

MATERIALS:

- Dried corn cobs
- Dried corn husks
- Corn silk (if available)
- Assorted fabric
- Yarn
- Markers
- Glue
- Scissors

DIRECTIONS:

1. Read and discuss the following background information with the class prior to completing the activity:

In early America, there was no industry devoted to making toys for children. Most families were involved in farming, and children stayed busy with chores. When they had time to play, they had to find amusement from everyday life. During this time, toys were made with objects that could be found around the home. Toys were usually simple in design and made with different materials depending on geographic location and the wealth and talents of the child's family.

One major crop grown by early American farm families was corn. The Pilgrims at Plymouth Rock would have starved in 1621 if natives had not taught them how to grow corn. Besides eating the corn and feeding it to their animals, the Pilgrims also learned to stuff their mattresses with corn husks and to burn corn cobs for fuel. With the cobs and the husks, they began to make toys.

Today, we have many more uses for corn. Corn syrup sweetens candy bars and many of the sweet drinks we enjoy. Corn is even used to make the plastic used in modern toys.

2. Tell students they are going to learn to make toys from corn cobs, like children in early America did.
3. Show students how to make corn cob people and corn cob airplanes, as described below. It may be helpful to have some examples made prior to facilitating the lesson.
4. Students will make one of the two toys described or design and make some other toy or useful object from the materials provided.

CORN COB PEOPLE:

- Students will use markers to draw faces on the large ends of their corn cobs.
- Students will choose fabric remnants to wrap around the cob and tie the cloth in place with yarn.
- If corn silk is available, students may use it to make hair for their dolls in braids or loose strands.
- If no silk is available, have students draw hair or glue on yarn.

CORN COB AIRPLANES:

- Students will decorate the planes with markers, as desired, before crisscrossing two corn cobs and securing them with yarn.

CORNBREAD IN A BAG

INGREDIENTS:

- 1 cup cornmeal
- 2 tablespoons brown sugar
- ½ cup whole-wheat flour
- ½ cup all-purpose flour
- 4 teaspoons baking powder
- ½ teaspoon salt
- 2 eggs, beaten
- 1 cup milk
- ¼ cup oil

EQUIPMENT:

- Gallon-size plastic bag
- 9" x 9" pan
- Measuring cups
- Measuring spoons

DIRECTIONS:

1. Combine the cornmeal, brown sugar, flour, baking powder and salt in the plastic bag.
2. Close the bag.
3. Mix well by working bag with fingers until the ingredients are completely blended.
4. Add the eggs, milk and oil to the bag.
5. Mix well by working the bag with fingers.
6. Open the bag and pour the mixture into a 9" x 9" pan.
7. Bake at 400 degrees for 25 minutes.

DIY PACKING PEANUTS

BACKGROUND INFORMATION:

Unlike Styrofoam packing peanuts, cornstarch packing peanuts are biodegradable and decompose in water, leaving no toxic waste. The polymers - long-chain molecules that make up corn packing peanuts - occur naturally as opposed to Styrofoam peanuts being made up of synthetic, or man-made, polymers. Corn, being a plant, is a renewable resource that we could use to reduce the amount of non-renewable and non-biodegradable products.

MATERIALS:

- Cornstarch
- Water
- Paper cups (one per student)
- Spoons (one per student)
- Microwave access

DIRECTIONS:

1. Depending on your class age and size, you could measure out the ingredients into separate cups for students ahead of time. Each student needs one tablespoon of cornstarch and one teaspoon of water.
2. Hand out paper cups, spoons, cornstarch and water.
3. Add one tablespoon of cornstarch to the cup.
4. Add one teaspoon of water to your cup and use the spoon to stir into a paste.
5. Once mixed, you can try to form the peanuts into shapes.
6. Microwave the mixture for 20 seconds.
7. Facilitate a class discussion asking the following questions:
 - How could this type of product be more beneficial to our environment?
 - Explain why this product is considered a renewable resource.

CORN FIELD MATH

NAME: _____

VOCABULARY:

- **Bushel:** A unit of measure usually equal to 35 liters or 9.5 gallons.
- **Acre:** A unit of land area equal to 4,840 square yards, or about the size of a football field.

A farmer is preparing to plant corn in his field. He needs your help to figure out how much seed to buy to plant one acre of corn.

1. An acre of land is 43,560 square feet. Each side of a square is 208.7 feet.

- a. If the rows are 2.5 feet apart, how many rows are there? (Round to the nearest whole number.)

$$208.7 \div 2.5 = \underline{\hspace{2cm}}$$

- b. How many corn plants will be in each row if there are 22,000 plants in a square acre? (Round to the nearest whole number.)

$$22,000 \text{ (plants)} \div \text{(answer to \#1a)} \underline{\hspace{1cm}} = \underline{\hspace{2cm}}$$

2. There are about 600 kernels on an ear of corn. If a corn plant produces one ear of corn, how many kernels are produced on one acre of land?

$$22,000 \text{ (plants)} \times 600 \text{ (kernels)} = \underline{\hspace{2cm}}$$

WAIT TO CHECK YOUR ANSWERS TO THE FIRST TWO PROBLEMS BEFORE CONTINUING.

3. This field produces 135 bushels of corn per acre. How many kernels of corn are in a bushel? (Round to the nearest whole number.)

$$\text{(Answer to \#2)} \underline{\hspace{2cm}} \div 135 \text{ (bushels)} = \underline{\hspace{2cm}}$$

4. Two farmers, Jill and Mark, each have 640 acres of planted corn.

- a. Farmer Jill's crop produces one ear of corn per plant. At 135 bushels of corn per acre, how many bushels of corn will this field produce?

$$640 \text{ (acres)} \times 135 \text{ (bushels per acre)} = \underline{\hspace{2cm}} \text{ total bushels of corn}$$

- b. Farmer Mark's crop produces two ears of corn per plant. How many bushels of corn will this field produce?

$$\underline{\hspace{2cm}} \text{ (total from \#4a)} \times 2 = \underline{\hspace{2cm}} \text{ total bushels of corn}$$

CORN FIELD MATH

KEY

A farmer is preparing to plant corn in his field. He needs your help to figure out how much seed to buy to plant one acre of corn.

1. An acre of land is 43,560 square feet. Each side of a square is 208.7 feet.

- a. If the rows are 2.5 feet apart, how many rows are there? (Round to the nearest whole number.)

$$208.7 \div 2.5 = \underline{83}$$

- b. How many corn plants will be in each row if there are 22,000 plants in a square acre? (Round to the nearest whole number.)

$$22,000 \text{ (plants)} \div \text{(answer to \#1a)} \underline{83} = \underline{265}$$

2. There are about 600 kernels on an ear of corn. If a corn plant produces one ear of corn, how many kernels are produced on one acre of land?

$$22,000 \text{ (plants)} \times 600 \text{ (kernels)} = \underline{13,200,000}$$

WAIT TO CHECK YOUR ANSWERS TO THE FIRST TWO PROBLEMS BEFORE CONTINUING.

3. This field produces 135 bushels of corn per acre. How many kernels of corn are in a bushel? (Round to the nearest whole number.)

$$\text{(Answer to \#2)} \underline{13,200,000} \div 135 \text{ (bushels)} = \underline{97,778}$$

4. Two farmers, Jill and Mark, each have 640 acres of planted corn.

- a. Farmer Jill's crop produces one ear of corn per plant. At 135 bushels of corn per acre, how many bushels of corn will this field produce?

$$640 \text{ (acres)} \times 135 \text{ (bushels per acre)} = \underline{86,400} \text{ total bushels of corn}$$

- b. Farmer Mark's crop produces two ears of corn per plant. How many bushels of corn will this field produce?

$$\underline{86,400} \text{ (total from \#4a)} \times 2 = \underline{172,800} \text{ total bushels of corn}$$

CREATING A CORN SNACK RECIPE

MATERIALS:

- Measuring cups
- Measuring spoons
- 4x6 index cards
- Pencils
- Plastic sandwich bags
- Six to eight assorted corn snacks that include corn related ingredients.
(Examples: corn flakes, Frosted Flakes®, corn nuts, Corn Chex™, popcorn, caramel corn, Kix® cereal, Corn Pops®, Bugles, corn chips (tortilla chips or Fritos®), M&M's (ingredients include corn starch & corn syrup), puff corn, puff caramel corn, fruit snacks, marshmallows, etc.)

DIRECTIONS:

1. Read and discuss the following background information as a class:

After farmers harvest corn, it can be used in many ways. Corn can be used to plant and grow new corn plants. It can be used to feed livestock. It also can be used to feed humans. There are many different foods that humans eat everyday that have ingredients that include corn. Some common corn ingredients include cornstarch, corn syrup, high-fructose corn syrup, corn meal and corn oil.

TIP: Educator could bring examples of the common corn ingredients listed above or create a poster with images of the products.

2. Instruct students that they will be creating their own snack mix using foods that have corn ingredients in them.
3. Introduce each corn snack by holding it up so the class can see the packaging and tell students the main corn ingredient that can be found in the snack item. For example, if marshmallows are used, the educator would highlight the main corn ingredient in marshmallows is corn syrup.
4. After going through each of the provided snack items and their corn ingredients, give each student an index card.
5. Draw the following recipe card example on the classroom chalk board or white board and instruct the students to copy it on their index cards.

Corn Snack Mix	Student Name
<u>Ingredients (Include amounts)</u>	
•	•
•	•
<u>Instructions</u>	

6. While students are copying the information onto their index cards, place the various snack mix ingredients around the room with various measuring spoons and cups.

DIRECTIONS, CONTINUED:

TIP: For younger students, educator may choose to provide a single measuring cup at each station that is a predetermined size. At the station, it may be helpful to have a label or small sign that tells students the size of the measuring spoon or cup. For example, if there is a station with corn square cereal, the educator could provide a $\frac{1}{2}$ cup measuring cup with a label or sign that says " $\frac{1}{2}$ cup".

For older students, educator may choose to provide two or more measuring cups of varying sizes that students can choose between. Educator also could choose whether to provide labeling or signage depending on students' prior exposure to fractions. This step also could be utilized to practice fractions.

Regardless of the age of students, providing the measuring cup at each station will help regulate the amount of the ingredients that students take.

7. Explain to the students that they will now go around the room and build their own snack mix recipe.
8. They will choose four snack items to add to their snack mix.
9. Students should add only one scoop of a snack item while visiting the four different stations.
10. As students go to their four different stations, they will record the amount and name of the ingredients on their index card under the "Ingredients" section.

TIP: It may be helpful for the educator to model this using the example recipe card drawn on the board.

11. When students have collected four snack items in their snack mix, instruct them to return to their seats.
12. Instruct students to summarize the steps they took to create the snack mix. This will be recorded under the "Instructions" section. Tell students that they can use the back side of the index card if they run out of room.
13. Once students have finished writing the instructions on their recipe cards, they can eat their snack.
14. While students are eating their snack, facilitate discussion surrounding the activity. Use the list below of possible questions to ask:
 - Can some of you share your instructions that you wrote on your recipe card?
 - Discuss the similarities and differences of how each student chose to write their instructions.
 - Why did you choose the ingredients that you did?
 - Which of these foods here today are healthy?
 - Which of these foods here today are not healthy?
 - How could you have made your snack mix healthier?

CONCLUSION ACTIVITY:

1. Instruct students to get into groups of three-four students.
2. Students need a pencil and scrap piece of paper.
3. Tell students they will have one minute to brainstorm other food products that contain corn or corn ingredients.
4. Students should choose one person in their group to record their answers.
5. Set a timer for one minute and instruct the students to begin.
6. After a minute, let students share their answers.

LIFE CYCLE OF CORN

ACTIVITY FROM AMERICAN FARM BUREAU FEDERATION'S MY FAMILY'S CORN FARM EDUCATOR'S GUIDE

MATERIALS:

- **Activity 1 Worksheet:** Life cycle of corn - copies for each student.
- **Activity 2 Worksheet:** Life cycle title cards - copies for each student.

DIRECTIONS:

In this activity, students learn the life cycle of a corn plant. Then, students cut and organize the parts of the life cycle of a corn plant, from seeds to a mature plant.

1. Read *My Family's Corn Farm* as a class. Have the class discuss the different parts of the corn plants they remember from the book. As students mention them, copy them onto the board. (Example: kernel, husk, roots, ear, leaves)
2. If available, bring out a corn plant in the front of the room (if not, put a picture or diagram on the board). Give the students time to examine the plant and encourage them to look for the parts they have just listed.
3. Discuss the function of the parts of the plant:
 - Roots: gather water and nutrients from the soil
 - Leaves: absorb sunlight to help corn (and all plants) grow
 - Ear: the cob and kernels together surrounded by a husk
 - Husk: protects the corn kernels until harvest
 - Kernels: the seeds of the plant and the part of the plant made into food
4. Pass out Activity 1 Worksheet and review the corn life cycle:
 - a. Seeds
 - b. Germination
 - c. Sprouting
 - d. Seedling
 - e. Flowering
 - f. Fruit
 - g. Fruits with Seeds
5. Pass out Activity 2 Worksheet and have the students cut out each life cycle phase.
6. Tell the students to scramble the cut-out paper pieces, so that they are no longer in the correct order.
7. Then have the students try to put them back in the correct order, from seeds to a fully mature plant.
8. Once the students have completed the life cycle, instruct them to call on you to check their work. If the life cycle isn't correct, have them try again.

TIP: Tell students that they may only call on you to check their work if they have ordered all the steps in the life cycle.

DIRECTIONS, CONTINUED:



9. If students have difficulty placing each phase in the correct order, have them partner with someone to complete the project as a group.
10. Once all students have completed their life cycle of the corn, have a guided discussion with the class.

ASK: What was the most difficult part to place? What was the easiest part to place?

11. With more understanding of the life cycle, break the class into seven equal-size groups. Then give each group a stack of life cycle stage cards. Make sure each student in the group has a card (ex. Group One - Seeds, Group Two - Germination, Group Three - Sprout, etc.)
12. Once every student has a title card, challenge students to find new groups, this time with every stage of the corn life cycle in the group. Once in the groups, students should arrange themselves in order.

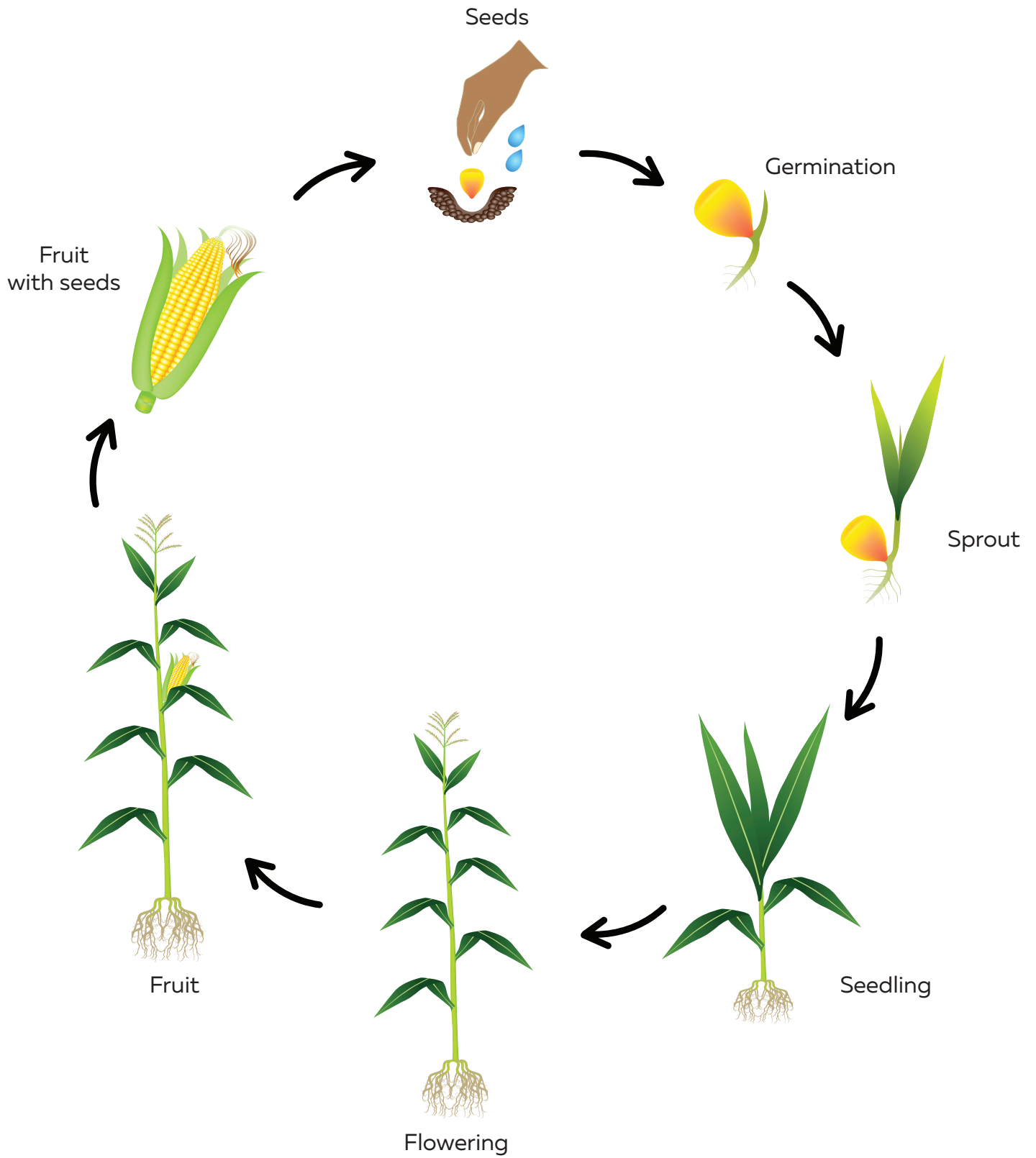
ADDED CHALLENGE: Have a rule where no one can talk or where only a few students can talk.

13. After students have had a few chances to find a group and get in the right order, review the life cycle one last time. Then ask what happens after the corn is fully grown (talk through harvesting, feeding to animals or making into products).

OPTIONAL: Reward of popping corn at the end of the life cycle.



ACTIVITY WORKSHEET: LIFE CYCLE OF CORN WORKSHEET #1



**ACTIVITY WORKSHEET: LIFE CYCLE TITLE CARDS
WORKSHEET #2**

SEEDS

GERMINATION

SPROUT

SEEDLING

FLOWERING

FRUIT

FRUIT WITH SEEDS