

2nd grade Popped Corn and Weights and Measures

Date: September

Description: 3 rotations: 1) Picking corn and herbs from garden, 2) Weighing popped/un-popped corn, 3) Popping corn and making topping.

Objective: Students will learn more about measuring and using scales, and will engage in the scientific process by making predictions, testing and explaining results.

Background: A popcorn kernel is actually a seed. Like other seeds, it has a tiny plant embryo inside, which could eventually grow into a plant. The embryo is surrounded by soft, starchy material that provides the embryo with energy to grow. This material that surrounds the embryo holds water. When the kernel is heated to about 400 degrees Fahrenheit, the water inside the kernel turns into steam. This steam creates pressure inside the kernel causing it to explode. The soft starch inside the kernel breaks out to create the fluffy white area of a popped kernel. If a popcorn kernel is too dry, it will not pop. It should be about 14% water, which is lost to the air after it pops.

The class will be divided into 3 groups with one group going to the garden to pick an ear of corn and some herbs. The two groups inside will be 1) making the topping and 2) making predictions about popped corn measurements

Preparation:

Station 1- Harvesting Corn and Herbs

- Gather two bowls for students to take outside for collecting herbs
- Check with garden coordinator to see what types of corn were planted and the amount that can be harvested (specifically check for popcorn) and where herbs are located

Station 2- measuring and weighing corn

- Photocopy 15 worksheets, or enough for each student pair to complete 1 worksheet
- Bring a box of small zipper bags, a bag of un-popped corn kernels, measuring cups
- Prepare 4 large zipper bags of 7 cups popped corn (to be reused with each group) for weighing. (¼ cup un-popped=7 cups popped!)
- Ask the teacher to have 4-bucket scales available - one for each pair in a small group.
- Bring a digital scale from home or collect one from WWVF2S.

Station 3- making popcorn and the topping

- Bring an air-popper, 4 large bowls, 1 small bowl, knives and cutting boards to cut up the herbs, and measuring spoons to measure out the herbs.
- **For Prospect Point, bring a camp stove, hot pads, oil and a pot instead of an air-popper, because we will keep all stations outside given the distance from class to the garden.**
- Gather oil, salt, and garlic powder.
- Write the recipe on a card or up on the board so students can follow it.

Action:

- Review the 4 rules of the garden:
 1. Keep feet on the paths and out of the beds (plant roots like soil that is not compacted).
 2. Don't pick anything without asking first (some plants aren't edible or may not be ripe).
 3. Be respectful to: creatures (rolly pollies, worms), the equipment, your fellow gardeners.
 4. When using tools, keep them below the waist so no one gets hurt! Carry tools low and slow.

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Divide the class into 3 groups that will rotate every 12 minutes.

Station 1: Picking Corn and Herbs from Garden (12 minutes)

- Pair up students and form two lines so that each pair is walking together. As students walk to the garden, ask them to tell their partner 2 things that they know about gardens and, if they planted the 3-sisters garden, discuss what the 3 sisters are.
- Once in the garden, circle as best you can around the 3 sisters bed with the corn. Ask students if they can point to the corn plants? Can everyone remember the 3 sisters plants (Native American garden with beans, corn and squash). How do 3 sisters help each other?
- Choose one or two students to pick an ear of dried corn (yellow is the popcorn).
- Now show students the herb plants and demonstrate picking leaves using the two handed method with one hand holding the plant and one picking the leaf, so they don't pull the whole plant out.
- Have every student pick 2 different herb leaves and place them into the bowls. Mixing is OK
- Have partners line up in two lines and ask them to share with their partner if they have ever tasted an herb before and with what foods.

Station 2: Weighing Popped vs Un-popped Popcorn (12 minutes)

- Divide the small group into pairs. Give each pair a worksheet and review it
- Give each pair a "bucket balance scale".
- Have one student in the pair measure $\frac{1}{4}$ cup of corn kernels into a zipper bag and the other student complete 1 and 2 on the worksheet. Good time to ask how many $\frac{1}{4}$ cups make a cup? And how many $\frac{1}{2}$ cups make a cup etc.
- Ask students if they think un-popped popcorn weighs more, less or the same as popped popcorn? Have the pair discuss with each other and finish question 3.
- Have them then place the un-popped kernels in one side of the balance scale and the popped corn in the other side, and weigh each side. The bucket scales will be close to balanced. Work with the students to also weigh both on a digital scale for a more precise measurement. Complete the worksheet questions 4 and 5.
- Ask if students know why corn seeds pop. What happens to water when it heats up? What is inside the seed trying to escape when it gets super heated? Explain that the kernels heat and pop because the water inside is turning to steam and making them burst.
- Have the students take their $\frac{1}{4}$ cup bag of un-popped kernels to the next station

Station 3: Mixing Topping (15 minutes)

- Help the students complete the following tasks: wash hands, tear and cut herbs, measure each ingredient in the recipe, pour kernels in the air popper, mix the topping ingredients.
- Each group makes one bowl of popcorn and one bowl of topping, add the topping to the popcorn and mix/shake bowl slightly to distribute it evenly.
- As a whole class share the popcorn.

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Herb Popcorn Topping (One batch topping per batch of ½ cup un-popped corn kernels)

2 T fresh basil, chopped (1 T)

2 T fresh parsley, chopped (1 T)

¼ t garlic powder (1/8 t)

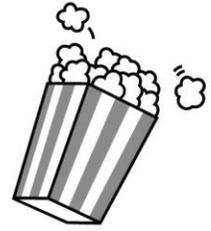
1 t salt (1/2 t)

2 T oil (1 T)

Combine herbs, garlic and salt in a small bowl. Place popcorn in a large bowl drizzle oil on top. Add herb mixture to the popcorn. Cover bowl and shake.

Additional Optional herbs in some gardens: Sage, Oregano, Thyme, Rosemary

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Grade 2 Fall School Garden Activity Worksheet

Popped Corn Weights and Measures

What do you KNOW?

1. Write how many cups of corn kernels you will be weighing? (in cups) _____

2. Which is bigger, the popped corn or the un-popped corn? (Which one takes up more space?)

What do you guess?

3. The un- popped corn will weigh: Less More The same as the popped corn?
(Circle one)

What did you find out?

4. Weight of the corn kernels before they are popped (in grams): _____
5. Weight of the corn kernels after they are popped (in grams): _____

Why does corn pop? Do other grains pop?

Good Job Scientist! Now enjoy some popcorn

