

MATERIALS

- Large Tarp
- Large Plastic Bin(s)
- Window Screen
- Garden Scissors
- Tub Trug(s)
- Amaranth flower/leaves

PREPARATION

- Watch the Amaranth bed and wait till the Amaranth has gone to seed. Make sure there is enough ripe heads of Amaranth so that each student can have a small piece.
- Stretch the tarp across the floor/ground of the classroom or garden classroom, placing the bin and screen in the center.

PROCEDURE

Part 1: Demonstrate Threshing and Winnowing Amaranth

- Demonstrate removing the chaff and seeds of Amaranth from the seed head by gentling tickling it with one hand, letting the seeds fall into the palm of the tickling hand. This is called “threshing.” Have everyone repeat the word “threshing” as they mimic the tickling gesture. Walk around the class and show them what is in your palm.
- Next we need to separate the red chaff from the black seeds. We do this by blowing gently on the seeds. Blow gently on your palm. This is called “winnowing.” Have students repeat the word “winnowing” and mimic blowing. Show them the black seeds that remain in your hand.

Part 2: Students Thresh and Winnow Amaranth

- Take students in a line out to the garden. Cut each student a small piece of Amaranth. Have them carry it gently back to the garden classroom (so that no seeds fall) and stand with their toes on the edge of the tarp.
- Once everyone is ready, have students gently rub the seeds into their hands. Say “threshing.”
- Next have students gently blow on the seeds. “Say “winnowing.” Have students drop their seeds into the plastic bin in the center of the tarp.
- Repeat the threshing step, this time having students let the seeds fall directly onto the tarp. Do this with their eyes closed so they can listen to the gentle sound of the seeds hitting the tarp. What does this sound like?
- In small groups, have students rub the remaining seed heads and seeds over the screen, so that the smaller seeds fall into the tub. This is another form of threshing.
- With the help of some students and maybe teachers, collect the seeds from the tarp and pour them through the screen into the tub.
- Now, inside the tub are seeds and chaff. You can demonstrate winnowing by blowing into the bin, grabbing handfuls of seeds and blowing into your hands, or by using a fan or the wind to blow away the chaff as you pour the seeds into a second container.

Part 3: Review Steps and Explore the Senses

- Have students review the steps Threshing and Winnowing by gesturing/mimicking the step as they say it aloud.
- Next ask the students which of their senses did they use in today’s lesson: What sound did the seeds make as they hit the tarp? How did they feel? What color did they make our hands? Why/How?

Threshing and Winnowing Amaranth

ENGAGE

Harvest a head of Amaranth to share with the class. Select a beautiful specimen that shows off the flower, seeds, and leaves. Tell the class that both the leaves and seeds are edible—the seeds can be popped like popcorn and are used to make delicious granola bars called ‘alegria’ or ‘happiness.’ Also, this plant can be used as a dye. It has been a very important food across cultures and history. Some people call it “Red Spinach,” “African Spinach,” “Callaloo,” or “Amaranth.”

OBJECTIVES

- Students will understand the value of amaranth (as food and dye).
- Students will understand *threshing* and *winnowing*.
- Students will review the five senses.

EXPLAIN

The history of Amaranth’s usefulness to humans is expansive. The Aztecs referred to it as *huauhtli*, and it made up 80% of their pre-conquest diet. One of their most important holidays was to celebrate *Huitzilipochtli*, their hummingbird-like god. And since real hummingbirds feast on amaranth flowers, amaranth was used in many ways to celebrate the holiday, and many amaranth treats (like *alegria*) are still popular in Mexico today.

In Indonesia and Malaysia, leaf amaranth is called *bayam*. In the Philippines, the Ilocano word for the plant is “kalunay”; the Tagalog word for the plant is *kilitis* or “kulitis”. In the state of Uttar Pradesh and Bihar in India, it is called Chaulai and is a popular green leafy vegetable (referred to in the class of vegetable preparations called *saag*).

It is a traditional food plant in Africa, hence the nickname “African Spinach.” Amaranth greens are a common leaf vegetable throughout the tropics and in many warm temperate regions, where they are often called Callaloo.

Amaranth may be a promising source of protein to those who are gluten sensitive, because unlike the protein found in grains such as wheat and rye, its protein does not contain gluten. Cooked amaranth leaves are a good source of vitamin A, vitamin C, and folate; they are a complementing source of other vitamins such as thiamine, niacin, and riboflavin, plus some dietary minerals including calcium, iron, potassium, zinc, copper, and manganese.

In 1977 article of Science, Amaranth was described as the crop of the future (even though it’s really a crop of the past!), as it is easily harvested, its seeds are a good source of protein, it is easy to cook, and it grows very rapidly (some consider it a weed!).

ADDITIONAL CONTENT INTEGRATION (see previous page)

After you’re done threshing and winnowing, your amaranth seeds can be saved and planted for next year—but you will have more than you need! You can also use these seeds (a grain) to grind into amaranth flour, pop like popcorn, or even to make ‘Alegria.’ You can also try preparing Callaloo from the greens. Feel free to look up recipes online and explore the many uses of this plant.

ADDITIONAL MATERIALS

- Grain Mill
- Stove and Pan
- Access to Recipes

EVALUATE

Journal prompt: Diagram and describe the threshing and winnowing process. What senses did you use today? What other crops can be winnowed and threshed and made into grain?