Pre-Spring Field Trip Activities

Meet the Brassica Family

Duration: ~1-1.5 hours **Grade Level:** Pre K-4th*

Location: In the classroom

Recommended Books:

Read/Watch "Plants Feed Me" book by Lizzie Rockwell, https://youtu.be/hYxLdDMnV6g

**Note: Educator's choice! This set of activities can be used as one lesson plan, or its resources and activities can be used for separate shorter lessons, based on your classroom structure and student needs!*

Materials:

- "Meet the Brassicas" PowerPoint slideshow
  - PDF version: "Meet the Brassicas"
- "Build a Super Brassica" coloring sheet (2 pages)
- "Salad Greens Seedlings" worksheet
- Scissors (or pre-cut Brassica cousins for Pre K)
- Colored pencils/crayons

Theme: From cauliflower to cabbage, and many "greens" in-between, the plant cousins in the brassica family are nutritious veggies we can eat!

Goals:

- Students will be introduced to the concept of a *plant family*: a group of plants that share similar features, or traits.
- Students will be able to recognize the pattern of features found in the brassica family.
- Students will create a "super brassica," assembling the different members of the brassica family to form a brassica with all the modified features.

Introduction (10 mins):

Did you know that plants can have families? Just like in a human family, plants can have parent or grandparent and be related to each other like brothers and sisters or cousins. Have you ever noticed that members of a human family can have something in common? Sometimes there are even individuals with surprising characteristics!

For example…

Teacher gives an example of shared family traits (being sensitive to many different types of families).

Here's our Oxbow example: Farmer Shannon at Oxbow and her parents all are short and have blue eyes, but one of her cousins has surprising red hair, and one is way taller than the others.

A note about inclusivity:

We know that a human family can take many different shapes. Make sure the family examples you give are inclusive; you don't have to be related by birth to have something in common!

Ask students: Do you have any brothers, sisters, parents, or cousins? Do you have anything in common/share any traits with them? For example: do you have the same eye color, the same hair color, enjoy playing the same games or eating the same foods?

Today we're going to meet a plant family, the Brassicas! This is the family that broccoli and cauliflower (and many other veggies) belong to!

Pre-K & K: Does anyone remember where plants come from or how they start their lifecycle? That's right - seeds! And when a fruit or vegetable is planted and growing on a farm or in a garden, we're usually planning to eat a certain part of the plant. Ask questions/give examples: If you're going to eat a carrot, which plant part do we eat? (the root, sometimes the greens!)

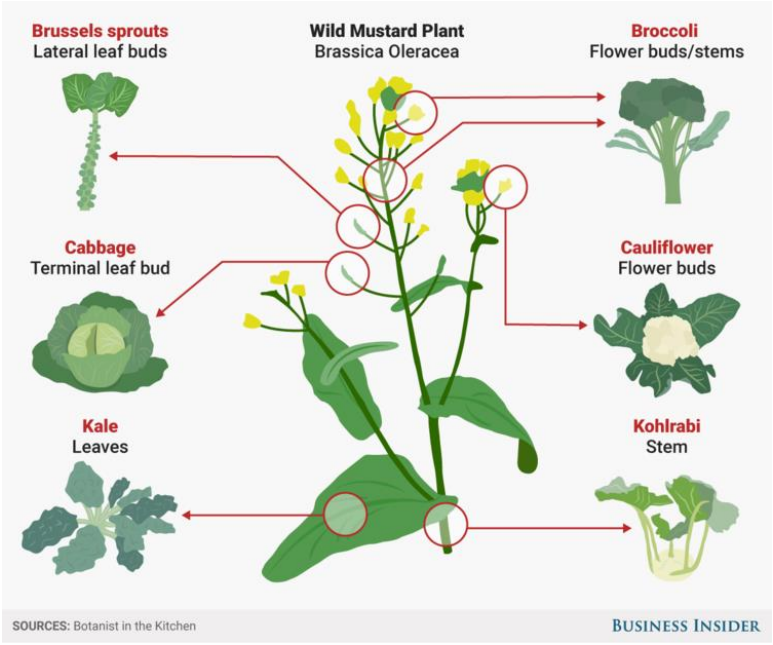
Read/Watch "Plants Feed Me" book by Lizzie Rockwell, https://youtu.be/hYxLdDMnV6g

Introduction to the Brassicas:

Show the full slideshow or a portion of the slideshow based on your group's readiness. (Recommended for Pre K & K: Show slides 1-7 of the PowerPoint).

Farmers and gardeners grew these brassicas on purpose, to have specific yummy parts! They did this by picking the seeds from the plants with: bigger leaves (like kale), or with rolled up leaves (like cabbage), and over time each plant developed its own extra tasty feature due to this selection by the farmers.

Transition to activity: All brassicas start as a seed. Then, they sprout two leaves called "cotyledons.". All brassicas start out with tiny heart-shaped leaves!



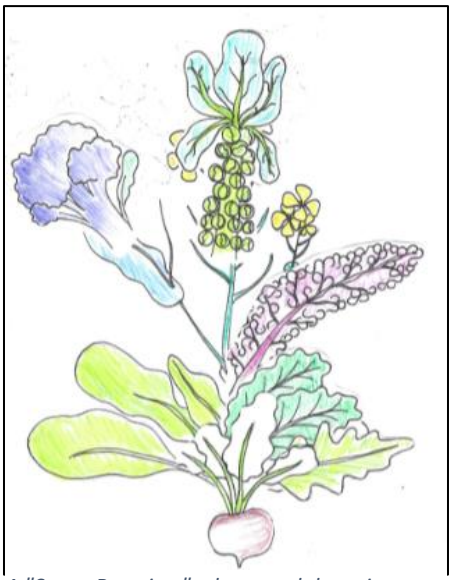
https://www.businessinsider.com/brassica-oleracea-broccoli-kale-brussels-sprouts-2017-5

Activity (30 mins):

Go through these activities step-by-step with the students:

"Salad Greens Seedlings" worksheet (10 mins.)
"Build a Super Brassica" coloring sheet set (20 mins.)

For older students: have students build their "Super Brassica" by attaching the different cousins to the plant in the location that represents the modified feature. Example: attach a kale as a leaf, attach a broccoli or cauliflower as a flower & stem, etc. (Reference slide #20)



A "Super Brassica," where each brassica "cousin"' is placed on the Grandparent plant where the part that was selected (the veggie we eat) is bigger, tastier, or different-looking!

Teacher Notes:

Click through the "Meet the Brassicas" PowerPoint before the lesson; this should give you the basic information needed about the brassica family. You can also refer to the resources in the links below.

When/if students are coming out to Oxbow for a Spring Farm Adventure, they will get to meet a brassica plant in person. Have them come with any questions they might have to ask their farmer educator!

Grow a Brassica!

Often teachers will use rapid-cycling brassicas like turnips and bok choi (Brassica Rapa) as a science lesson for students, because of their quick five-week cycle from seed to seed! Here's a great example from Hawaii of a lesson plan involving this plant:

https://hilo.hawaii.edu/affiliates/prism/documents/Lesson2.1LifeCycleofBrassicaPlants.pdf

Inquiry Questions:

- Do you have any brothers, sisters, parents, or cousins? Do you have anything in common/share any traits with them, for example you have the same eye color, the same hair color, or enjoy playing the same games?
- Do you think all of the members of the Brassica family taste the same?
- If all these veggies are related, what does that mean for a farmer or gardener?
- Have you ever seen any other plants that you think might be related?

Conclusion (5 mins):

Our take-home challenge after today is to recognize the patterns of the Brassica family **(Show slide 19 in PowerPoint)**. You can find them in nature, at the store, in a farm or garden, or even on your dinner plate. Wow! There are so many similarities between certain plants - it's because plants have families, too! Today we learned about the Brassica family, but there are so many more plant families to learn about. There are around 600 plant families in the whole world! (A scientist who studies plants is called a Botanist).

What does that mean for a farmer? Does each family member need the same exact things to grow?

At Oxbow: let's see if we can find the cousins of the Brassica family in the Kids' Farm field!

Resources:

Stromburg, Joseph, "Kale, Brussels sprouts, cauliflower, and cabbage are all varieties of a single magical plant species." *Vox* February 2015. https://www.vox.com/xpress/2014/8/6/5974989/kale-cauliflower-cabbage-broccoli-same-plant

Maggioni, Lorenzo, et al. "Origin and Domestication of Cole Crops (Brassica Oleracea L.): Linguistic and Literary Considerations." Economic Botany, vol. 64, no. 2, 2010, pp. 109–123. JSTOR, www.jstor.org/stable/41001172.

Gould, Skye, "These 6 common vegetables are actually all the same plant species." *Business Insider* May 2017. https://www.businessinsider.com/brassica-oleracea-broccoli-kale-brussels-sprouts-2017-5

NGSS 3-Dimensions Connections:

Performance Expectation (P.E.) supported: 1-LS3-1: Make observations to construct an evidence-based account that young plants and animals are like, but not exactly like, their parents. 3-LS3-1: Analyze and interpret data to provide evidence that plants and animals have traits inherited from parents and that variation of these traits exists in a group of similar organisms.	
Dimensions from Framework	**What students are doing**
Science and Engineering Practices (SEP)	
Developing and Using Models: Develop and/or use a model to represent amounts, relationships, relative scales (bigger, smaller), and/or patterns in the natural and designed world(s).	Students will create a Super Brassica, with traits representing the modified (or selected) features of the veggies we eat. Using this model, students will connect the familiar (and not so familiar) veggies with the original wild plant.
Disciplinary Core Ideas (DCI)	
Inheritance of Traits: Many characteristics of organisms are inherited from their parents.	Starting with the "grandparent" Brassica Oleracea, students will build a Super Brassica by attaching the veggies with the modified traits to the original plant. By attaching them in the location that represents the modified trait, students will deepen their understanding that the different brassica veggies originated as a wild mustard plant.
Crosscutting Concepts (CC)	
Patterns: Similarities and differences in patterns can be used to sort and classify natural phenomena.	Students will identify the patterns of the brassica family, including identifying the seedlings that all start as heart-shaped leaves. Additionally, students will be challenged to find other brassicas at home, at school, on a farm or garden, using the clues or plant family characteristics.