



Grade Level: 3-5

Essential Skills: 4, 5, 9

NGSS: 3-LS3-1

CCSS: 3.SL.1, 4.SL.1, 5.SL.1

Time: 50 minutes

Materials:

- Poster paper
- 2 barley parent plants, 18 offspring plants or the picture cards included
- *Traits of a Beast* worksheet
- *Sorting Barley* worksheet

***Materials available from Oregon Agriculture in the Classroom.**

[AITC Library Resources:](#)

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Lesson to Grow

Barley and Beasts: An Introduction to Inherited Traits

Description:

Students will discover traits in offspring come from parents and offspring from the same parents have different combinations of traits. This will be done through the analysis of images of two parent plants with completely different traits and 18 offspring plants resulting from the crossing of the two parents.

Background: Organisms (plants, animals and other living things) inherit traits (characteristics) from their parents. Traits refer to a single characteristic about an organism. In this activity, the main traits visible in the barley seed heads are size (tall or short), color (yellow or black), awns (the long spiky things coming out of the seeds; present or not). Humans inherit traits from their parents (eye color, height, skin color, ability to roll their tongue, finger length, etc.) in various combinations. For example, if one of your parents has brown eyes and the other has green eyes, and one can roll their tongue and the other cannot, you might end up with green eyes and the ability to roll your tongue, while your sibling has brown eyes and can't roll their tongue. Despite the fact you came from the same parents, you are not identical and have different sets of traits. The same is true with plants, and this concept is illustrated by the two barley parents and their 18 different offspring with various combinations of height, color and awn presence.

Directions:

Activity 1: Lineage of a Beast

1. Provide each student with a copy of the *Traits of a Beast* worksheet.
2. Explain to students that they are predicting the appearance of the offspring of Beast Parent A and Beast Parent B. To determine the appearance, you will analyze the inherited traits of the parents and use these traits to create possible offspring based on these traits.
3. Students will roll a die to determine with trait the offspring will show. If they roll an odd number the offspring will show the trait of parent a, if they roll an even number the trait of parent b will show.
4. After, students will draw their beast based on the traits they determined through rolling the die.
5. Allow time for students to show their beast drawings with the rest of the class explaining even though all of these beasts had the same parents they all took on different appearances but have similar traits passed on from their parents. This passing of traits from parents to offspring occurs in all living organisms.

Activity 2: Introduction to Barley

Today, we are going to look at the traits of barley. Barley is a grain, similar to wheat that is used for food for both humans and animals.

1. Show students the short video, *Growing Barley* by Iowa Ingredient (<https://youtu.be/okfNv2Jgv0c>) to introduce barley.
2. Explain to students the many different uses of barley relate to the inherited characteristics of the plant from it's parent plants. In our next activity, we will look at different barley seed head sets (the top portion of the plant) to identify and distinguish differences in appearance.
3. Divide students into 6 groups.
4. Provide each group with a set of barley heads or the picture of barley heads and the *Sorting Barley* worksheet. (You may also choose to have students do this on a larger poster sized sheet of paper.)

5. Instruct the groups to observe only the parents and write down 3 differences that they see between the 2 parents. After, allow time for discussion in small groups or as a class.
6. Introduce the word trait (something about a plant, animal, or other living thing that makes it different from others) and identify the differences students noticed as traits.
7. Instruct groups to pick 1 trait (difference) that they came up with and circle it on their worksheet or poster.
8. When groups have selected traits, tell them that you will be passing out the offspring of the 2 parents. They will then sort each seed head based on which parent it matches in terms of their selected trait (for example, if they picked color, they would sort all the seed heads into either dark (like Parent 1) or light (like Parent 2).
9. If time permits, allow students to do a gallery walk to see how other groups did their sorting.
10. Review the following concepts with students:
 - a. What is a trait?
 - b. What is a trait that you have from one of your parents?
 - c. Is it possible to have a trait that is different from both of your parents? Why or why not?
 - d. Do students with siblings have all the same traits as their siblings? Why or why not?
11. Introduce the concept of a plant breeder to students. For example, some careers like a Plant Breeder identifies traits in plants that make a better more efficient plant for farmers.
 - a. What kinds of traits might a plant breeder look to improve on a plant? (Disease resistance, higher yields, water efficiency, etc.)
 - b. How could plant breeders work to make a plant that help preserve natural resources?



Traits of a Beast

Student Name: _____

Inherited traits are passed down from parent to child. Explore the concept of inherited traits through this activity where you will design a beast based on a rolling a die and determining which trait is passed on from the traits of the beast parents listed below. You will roll the die once for each row of the chart and record the number in the dice roll column to determine which trait is passed on. If you roll an odd number, the beast child will have the same trait as beast Parent A. If you roll an even number, the beast child will have the same trait as beast parent B.

<u>Trait</u>	<u>Beast Parent A Characteristics</u>	<u>Beast Parent B Characteristics</u>	<u>Dice Roll</u>	<u>Beast Child Characteristics</u>
Shape of Head	Square	Circle		
Number of Arms	2	4		
Number of Legs	4	2		
Tentacles	2	0		
Number of eyes	1	3		
Eye Color	Red	Your Choice		
Hair	Short hair	Long hair		

Draw the beast child using the traits determined from the activity above. Be prepared to share your drawing with the class. Make sure to add color!



Activity Page

Sorting Barley

Student Name: _____

List 3 differences between Parent 1 and Parent 2.

Parent 1

Parent 2

Review Questions

1. What did all these plants have in common?

Answer:

2. A trait is something about a plant, animal, or other living thing that makes it different from others. What trait did you use to sort the barley?

Answer:

3. Did any of the barley plants have a trait that did not match either parent? Why?

Answer:

4. All the barley plants in the activity came from the same 2 parents, Parent 1 and Parent 2 (just like you came from 2 parents). Why do you think that all the plants had a trait in common with at least one of the parents?

Answer:

5. Even though all the plants had traits the same as the parents, they did not all look the same as each other. Why?

Answer:

Parent R



Parent D









