

**Lesson Topic:** Variation of Inherited Traits

**Objective:**

Students will be able to:

1. Identify variation within a species.
2. Explain how variations can be helpful to a species.
3. Create their own species with variations.

**Time Required:** 90 minutes

**Materials Needed:**

- Large pieces of paper: Black, White, and Newspaper (enough for partner work)
- LOTS of small circles of paper in small baggies: Black, White, and Newspaper (it works well to use the three-hole punch and use the remaining paper circles that are left).
- Probably 30-40 circles per bag
- Timers/stopwatch (1 per group or partner)
- Coloring utensils
- Teacher computer with internet access
- Projector/Smartboard
- 1 computer/laptop/iPad per student with internet access
- Variation of Inherited Traits Worksheet (attached)
- Variations Video
  - [Variation | Genetics | Biology | FuseSchool](#)

**Teacher Preparation:**

- Assign a Legends of Learning Content Review [Quick Play](#) playlist for the day(s) you will be teaching the lesson.
  - Content Review - Middle School - Variation of Inherited Traits
- Make copies of Variation of Inherited Traits Worksheet (1 per student)
- Prepare colored circles and put them into baggies (1 bag per group)

**Engage (10 minutes):**

1. Tell students to take some brief notes in their science notebook as they watch the video.
2. Play the [Variations Video](#).
3. Ask students “what are variations?”
4. Discuss the notes students wrote down. Tell students, “Today we will talk more about variations, why they happen, and how they can affect species.”

**Explore (20 minutes):**

1. Pass out a 1 large piece of paper (either black, white or newspaper) and one bag of circles to each partnership or group.
2. Instruct students to carefully sprinkle out their bag of circles onto their paper.
3. Then, one person in the group will time 10 seconds, while the other partner tries to

pick up as many circles as possible.

4. When the time is up, have the students write down how many of each color circle they picked up (Use the Variation of Inherited Traits handout attached).
5. Then, replace the circles by sprinkling them back onto the paper and have the rest of the students in the group take a turn getting timed picking up the circles.
6. Have each group sum up how many of each color they were able to collect total.
7. On the board, create the following charts:

| White Paper |       |           | Black Paper |       |           | Newspaper |       |           |
|-------------|-------|-----------|-------------|-------|-----------|-----------|-------|-----------|
| Black       | White | Newspaper | Black       | White | Newspaper | Black     | White | Newspaper |
|             |       |           |             |       |           |           |       |           |

8. Allow each partnership/group to share their data with the class, writing up how many of each color circle they picked up as a group, according to the color paper they were using. (You could write their data on the board, or you could have each group come up and write their data accordingly)

**Explain (15 minutes):**

1. After the data is collected, give the students a little time to take a look at the results.

\*The data could skew slightly, but more likely than not, the circle with the same color as the paper will have the fewest amount. If it did not turn out this way, discuss what may have caused the mix up (newspaper may be a different thickness of paper, the newspaper may have color photos that were cut out and used etc).

2. When each group is done, make sure all circles make it back in their bags and have a volunteer collect the paper.
3. Then, ask a few questions:
  - a. What do you notice about the data?
    - i. Looking at each color paper, which color had the most? Fewest? (Answers will vary, however, the circles with the same color background paper will probably have the fewest. The circle color picked the most will vary between the other two colors).
  - b. Why do you think it turned out this way? (The colored circles with the same colored background paper were camouflaged so they were seen and picked less).
  - c. What does this have to do with animals in the wild? (If an animal is able to blend into its surroundings, it will have a better chance of survival. The opposite is also true, if an animal stands out in an environment it lessens its chance of survival).
4. Tell students "If all of these colored circles were part of the same species, they have

color variations, meaning they have different colors. The type of environment they live in will decide which variation in color is most beneficial.”

5. Write the following definition on the board:
  - a. Variation - differences in characteristics within a population (Have students write this on their handout).
6. Tell students “Variation does not have to be fur color. Variation occurs in any of the inherited traits.”
7. Ask students “Can you think of any other kinds of traits that have variations?” (Answers will vary but may include: eye color, wave of hair, height, nose shape; in animals: claws, tail length, ear shape; in plants: wrinkled or round seeds, height, leaf shape, petal color etc).
  - a. How does variation play a part in this activity? (Within a species, the small differences in traits will help them to adapt to any environment).
  - b. Give me a scenario of how this activity may have played out in the wild (Answers will vary, but could include a brown creature living longer in the summer forest than a white creature living there).

#### **Elaborate (35 minutes):**

1. Tell students that they are to create a made-up creature along with a conducive environment for that creature.
2. They will also have to draw and color 2 other creatures of the same species that have a variation (it should look similar, with minor changes) within the same picture.
3. On a white sheet of paper, students must draw and color their pictures.
4. On the backside of their picture, the students must include the following information about their creature (it can be a bulleted list, or you can turn this into a more formal writing activity in sentence/paragraph form):
  - What is the creature’s name?
  - Where does it live?
  - What does it look like?
  - How does it eat?
  - What are the variations of this species?
5. Then, have students share their creatures. This could be done in small groups or one at a time in front of the class.

#### **Evaluate (10 minutes):**

1. Have your students [sign in to Legends of Learning](#). Instruct students to complete the Content Review playlist.
2. [Analyze student results](#) to determine what concepts need to be a focus for reteaching.

#### **Additional Lesson Strategies:**

- To use Legends for additional instruction, create a [custom playlist](#) with an [instructional game](#) and pre and post [assessment](#).



- To use Legends for a quick formative assessment, create a 5-question [assessment](#) in a [playlist](#).
- To use Legends for a student-directed experience, create a [targeted freeplay](#) playlist.
- Encourage students to play on their own at home in [Legends of Learning: Awakening](#) for a student-driven experience including avatars, battling, and quests all centered around topics they are covering in class.

# Variation of Inherited Traits

Name: \_\_\_\_\_

In the table below, record your results.

## Number of Circles

| Black | White | Newspaper |
|-------|-------|-----------|
|       |       |           |

## Class Results

White Paper

| Black | White | Newspaper |
|-------|-------|-----------|
|       |       |           |

Black Paper

| Black | White | Newspaper |
|-------|-------|-----------|
|       |       |           |

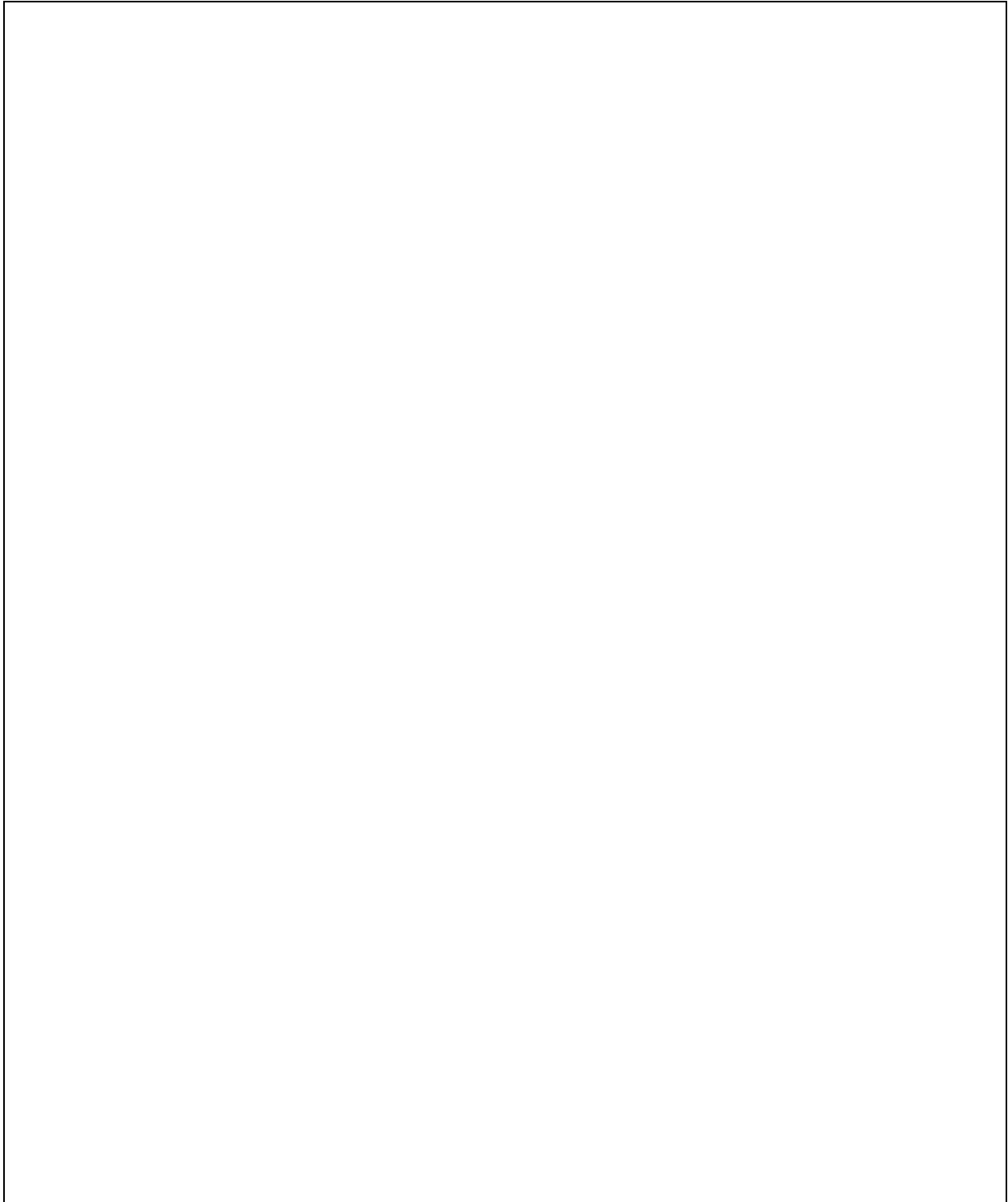
Newspaper

| Black | White | Newspaper |
|-------|-------|-----------|
|       |       |           |

Variation -



In the space below, draw and color a made-up creature. Then, draw 2 other creatures of the same species with different variations.





Answer the following questions about your creature.

- What is the creature's name?
- Where does it live?
- What does it look like?
- How does it eat? What does it eat?
- What are the variations of this species?

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