

Lesson Topic: Sexual Reproduction and Genetic Variation**Objective:**

Students will be able to:

1. Describe sexual reproduction in terms of:
 - a. two parents are required for sexual reproduction
 - b. sex cells (gametes) have half the genetic information as a regular cell, then combine to create offspring that has traits from both mom and dad.
2. Explain that sexual reproduction results in genetic variation.

Time Required: 85 minutes**Materials Needed:**

- Teacher computer with internet access
- Projector/Smartboard
- 1 computer/laptop/iPad per student with internet access
- Sexual Reproduction and Genetic Variation handout (attached)
- ["An Inventory of My Traits - Survey"](#) handout

Teacher Preparation:

- Assign a Legends of Learning Instructional [Quick Play](#) playlist for the day(s) you will be teaching the lesson.
 - Instructional - Middle School - Sexual Reproduction and Genetic Variation
- Assign a Legends of Learning Content Review [Quick Play](#) playlist for the day(s) you will be teaching the lesson.
 - Content Review - Middle School - Sexual Reproduction and Genetic Variation
- Make copies of Sexual Reproduction and Genetic Variation Handout (one per student)
- Make copies of "An Inventory of My Traits - Survey" handout (one per student)

Engage (10 minutes):

1. Have students arrange themselves in groups based on their eye color.
2. Ask students: "Why are there different groups?"
 - a. There are different groups because of *genetic variation* - everyone has different genes.
3. Ask students "If you have a sibling, do you have the same or different color eyes as them?" Tell students that because of sexual reproduction and meiosis, siblings don't inherit the same exact combination of genes from their parents (unless they are an identical twin).

Explore (30 minutes):

1. Have your students [sign in to Legends of Learning](#). Instruct students to complete the Instructional playlist.
2. As students complete the assigned game, students should fill out the Sexual Reproduction and Genetic Variation Handout.

3. Assist students as needed during game play, pause playlist if you need to address content or questions to entire class.

Explain (15 minutes):

1. Review answers to Sexual Reproduction and Genetic Variation Handout by writing answers on the board or Smartboard.

Elaborate (20 minutes):

1. Tell students that they will complete “An Inventory of My Traits - Survey.” This can be found on page 5 of [this](#) document.
2. Assist students as they complete the survey.
3. After students complete the survey, ask students to stand if they have detached earlobes. Have the standing students sit back down.
4. Repeat this process for each of the traits on the survey.
5. Ask students why a different number of people seemed to have each trait.
 - a. Every person has a different overall combination of traits that they inherited from their parents that makes them unique. This is why everyone looks different, even siblings.
6. Ask students why they don’t look exactly like their parents.
 - a. Each person has half of their DNA from their mom and half from their dad.

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.



Sexual Reproduction and Genetic Variation

1. How many parents are there in sexual reproduction?
2. What is meiosis?
3. What is a gamete?
4. Why do the offspring that are created as a result of sexual reproduction have more genetic variation than those that result from asexual reproduction?



Sexual Reproduction and Genetic Variation

Teacher Key

1. How many parents are there in sexual reproduction?
 - a. Two
2. What is meiosis?
 - a. A process that create sex cells with half the number of chromosomes as regular cells
3. What is a gamete?
 - a. The male and female reproductive cells that contain half the number of chromosomes as the organism's regular cells.
4. Why do the offspring that are created as a result of sexual reproduction have more genetic variation than those that result from asexual reproduction?
 - a. In sexual reproduction a sex cell from the father and one from the mother combine, creating new combinations of genes. In asexual reproduction, the offspring is a genetic clone (exactly identical) to their parent.