

Lesson Topic: Reproduction and Gene Transfer

Students will be able to:

1. Compare and contrast sexual and asexual reproduction.
2. Describe pros and cons of sexual and asexual reproduction.
3. Describe the genetic information of the offspring compared to their parent/s that result from sexual and asexual reproduction.

Time Required: 75 minutes**Materials Needed:**

- Teacher computer with internet access
- Projector/Smartboard
- 1 computer/laptop/iPad per student with internet access
- Reproduction and Gene Transfer handout (attached)

Teacher Preparation:

- Assign a Legends of Learning Instructional [Quick Play](#) playlist for the day(s) you will be teaching the lesson.
 - Instructional - Middle School - Reproduction and Gene Transfer
- Assign a Legends of Learning Content Review [Quick Play](#) playlist for the day(s) you will be teaching the lesson.
 - Content Review - Middle School - Reproduction and Gene Transfer
- Make copies of Reproduction and Gene Transfer Worksheet (1 per student)

Engage (10 minutes):

1. Show [this](#) website on the SmartBoard. Read the introduction aloud to students.
2. Tap on an organism and read the description aloud.
3. Take a class vote on if you think the organism reproduces sexually, asexually, or both.
4. Click the answer that the majority of students voted on. The correct answer will be highlighted in green. Try again if you get it wrong.
 - a. Have a student volunteer explain the reasoning behind why it is sexual reproduction, asexual reproduction, or both. Address misconceptions as needed.
5. Repeat this process for the other organisms, choosing a different student volunteer for each organism to operate the SmartBoard.

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 Reproduction and Gene Transfer 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 Reproduction and Gene Transfer Handout by writing answers on the board or Smartboard.

Elaborate (10 minutes):

1. Explain to students that even though asexual reproduction is efficient (requires less energy than sexual reproduction and requires only one parent), the benefits of genetic variation outweigh the benefit of efficient reproduction.
2. Show [this](#) video. (Note: stop video at 2:53 minutes.)
3. Ask students to describe two benefits of sexual reproduction over asexual reproduction
 - a. The offspring of sexually reproducing parents may not inherit a harmful mutation that their parent/s have. However, in asexual reproduction, the offspring will always inherit any and all harmful mutations from their parent.
 - b. Potentially beneficial mutations are introduced by sexual reproduction at a faster rate than asexual reproduction, which can speed up evolution to help organisms evolve in order to adapt and survive.

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:

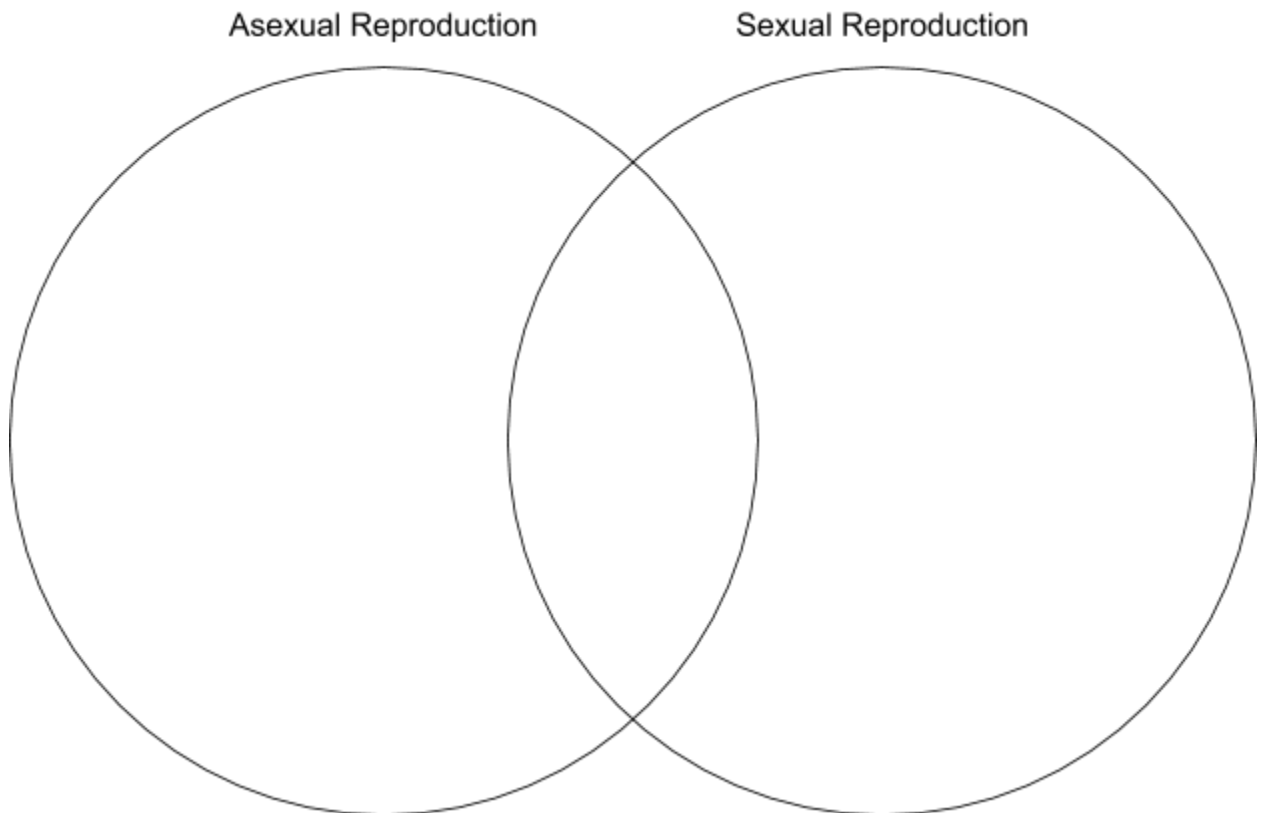
- To use Legends for additional instruction, create a [custom playlist](#) with an [instructional game](#) and pre and post [assessment](#).
- To use Legends for a quick formative assessment, create a 5-question [assessment](#) in a [playlist](#).
- To use Legends for a student-directed experience, create 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.

Reproduction and Gene Transfer

Name: _____

Directions: While playing the first game in Legends of Learning, use what you learn to answer the questions below.

1. Use the Venn diagram below to compare sexual and asexual reproduction:



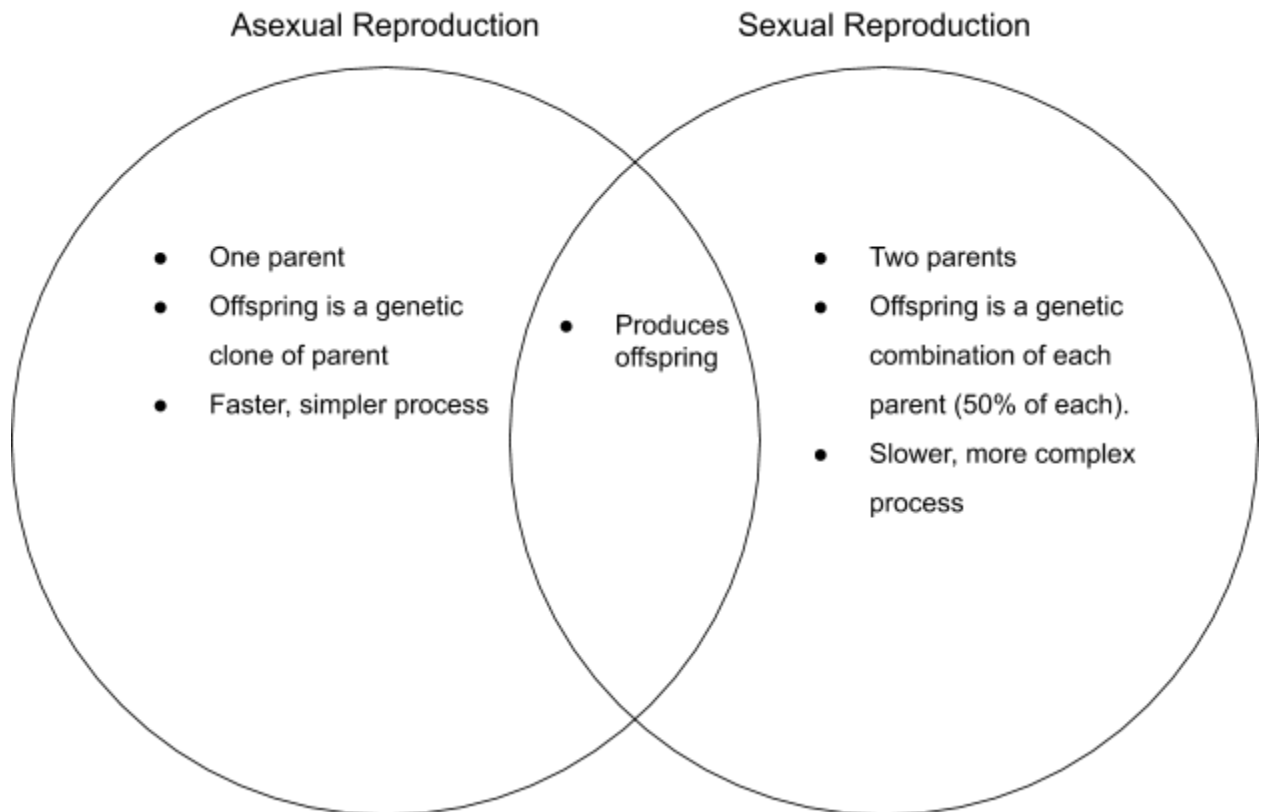
2. What is genetic variation?
3. Name one organism that reproduces asexually.
4. Name one organism that reproduces sexually.

Reproduction and Gene Transfer

Teacher Key

Directions: While playing the first game in Legends of Learning, use what you learn to answer the questions below.

1. Use the Venn diagram below to compare sexual and asexual reproduction:



2. What is genetic variation?
 - a. The differences in DNA among individuals of a population.
3. Name one organism that reproduces asexually.
 - a. Answers will vary. Any asexually reproducing organism is acceptable.
4. Name one organism that reproduces sexually.
 - a. Answers will vary. Any sexually reproducing organism is acceptable.