

Lesson Topic: Changes in Ecosystems Over Time**Objective:**

Students will be able to:

1. Identify changes to an ecosystem over time.
2. Explain the positive and negative effects of changes to an ecosystem over time.
3. Create their own species and describe its survival when an invasive species is introduced.
4. Write a rationale about the impact of invasive species on ecosystems over time.

Time Required: 90 minutes**Materials Needed:**

- [How Wolves Change Rivers Video Clip](#)
- Teacher computer with internet access
- Projector/Smartboard
- 1 computer/laptop/iPad per student with internet access
- Make copies of Change in Ecosystems Over Time Worksheet (1 per student)
- Stuffed animals (or any object) to act as an invasive species.

Teacher Preparation:

- Assign a Legends of Learning Instructional [Quick Play](#) playlist for the day(s) you will be teaching the lesson.
 - Instructional - Middle School - Changes In Ecosystems Over Time
- Assign a Legends of Learning Content Review [Quick Play](#) playlist for the day(s) you will be teaching the lesson.
 - Content Review - Middle School - Changes in Ecosystems Over Time
- Make copies of Changes in Ecosystems Over Time Worksheet (1 per student)
- Decide and locate objects (1 per group) to act as invasive species.

Engage (10 minutes):

1. Show the [“How Wolves Change Rivers”](#) video clip.
2. Ask students, “How did the wolves change the course of the rivers?”
 - a. Answer: Because the wolves were reintroduced into the particular ecosystem, they brought balance back into the ecosystem allowing all organisms to flourish.
3. Explain to students, “This video is just one example of how changes in an ecosystem over time can affect all of the organisms living in that ecosystem. Sometimes the changes are positive and sometimes they are negative. We will be talking more about these changes today.”

Explore (20 minutes):

1. Have your students [sign in to Legends of Learning](#). Instruct students to complete the Instructional playlist.
2. Assist students as needed during game play, pause playlist if you need to address content or questions to the entire class.

Explain (15 minutes):

1. Tell students they will be watching the “How Wolves Change Rivers” video one more time. This time, they will need to take notes about any and all changes to the ecosystem that happened because the wolves were brought back.
2. They will take their notes in the space provided on the Change In Ecosystems Over Time handout (attached).
3. Play the [video](#) again.
4. With a partner, have students discuss what they wrote down.
5. Then, as a class, discuss all of the changes that occurred in the video.
 - a. What are some things that occurred because the wolves were brought back?
 - i. Answers: the deer population decreased, the vegetation was able to grow back, the soil was better secured because of the vegetation growth causing less erosion, the rivers changed course, more animals came to the ecosystem because the vegetation was now growing providing food and shelter, etc.
 - b. This example seems to have a positive effect. Are all changes to ecosystems positive?
 - i. Answer: No
 - c. Can anyone think of some other changes that are made to ecosystems?
 - i. Possible answers: natural disasters such as floods, earthquakes, fires etc, human actions such as tearing down habitats to build, oil spills affecting marine life etc.

Elaborate (30 minutes):

1. Read aloud the ‘About Invasive Species’ paragraph from the Changes in Ecosystems Over Time handout to students.
2. Pull up the following website onto the projector to show students some examples of some invasive species (you do not have to read through them all. Pick your favorites!)
 - a. <https://www.earthrangers.com/wildwire/top-10/ten-of-the-worlds-most-invasive-species/>
3. Have the students get into groups of 4 or 5 students each.
4. Tell each group they are going to become a native species. As a group, they need to fill out the information in the Change in Ecosystems Over Time handout:
 - a. What kind of species are they? (flower, fish, snake, bird, mouse, lion etc).
 - b. Where do they live? (ocean, forest, desert, savannah, etc).
 - c. What do they eat? (they make their own food, birds, leaves, deer, etc).
 - d. What eats it? (bats, bears, monkeys, its at the top of the food chain, etc).
5. Present each group with an invasive species (a stuffed animal, or some other object).
6. Explain to students “ This object is an invasive species that has just been introduced into their native habitat. It lives where you live, eats where you eat, and is taking over!”
7. As a group, students will come up with a name for their invasive species. Then, they will write 1 paragraph about what becomes of their native species over time and why.
8. Each student group will present their native and invasive species to the class. Students will need to explain what happened because the invasive species was introduced.



Evaluate (15 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.



Change in Ecosystems Over Time

In the space provided, take notes during the video. Keep this question in mind: What changes occurred because of the wolves?

About Invasive Species

An invasive specie is any organism that is living in a new environment. Because it is not living in its native habitat, or where it is used to living, invasive species can be extremely harmful to an ecosystem.

Many times, invasive species are stronger and can reproduce faster than other species in the habitat. Because they are new to the particular ecosystem, there are no predators that hunt them to keep their population in check. It also gets to eat what it wants, which lessens the supply of food for the native organisms that live there. In fact, invasive species compete with the native plants and animals for all resources in that ecosystem. This can lead to extinction of organisms.

Group Species Activity

Pretend that you are a native species. Answer the questions below to inform us about your species.

1. What kind of species are you?
2. Where do you live?
3. What do you eat?
4. What eats you?
5. What is the name of the invasive species that was introduced?



Write a paragraph about what happened to your species over time and why.