

Lesson Topic: Factors Influencing Growth of Individuals and Populations

Objective:

Students will be able to:

1. Describe how population growth increases with greater resource availability.
2. Describe how population growth decreases during periods of resource scarcity.
3. Explain the relationship between different populations in a community.
4. Give examples of events that can increase and decrease a population.

Time Required: 75 minutes

Materials Needed:

- Index cards (1 per student)
- Printer or pen to write on cards
- Resource Availability Statements to make index cards (attached)
- Teacher computer with internet access
- Projector/interactive whiteboard
- 1 computer/laptop/iPad per student with internet access
- Factors Influencing Growth of Individuals and Populations Worksheet (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 – Factors Influencing Growth of Individuals and Populations
- Assign a Legends of Learning Instructional [Quick Play](#) playlist for the day(s) you will be teaching the lesson.
 - Content Review – Middle School – Factors Influencing Growth of Individuals and Populations
- Make copies of Factors Influencing Growth of Individuals and Populations Worksheet (1 per student)
- Use the statements provided to create an index card for each student about resource availability in the environment. Place the index card face down on each student's chair or pass them out, but do not allow students to read the card. (attached)

Engage (10 minutes):

1. Ask students to give an example of a population. (human population, animal population)
2. Have students look at their index cards.
3. Ask students if they believe their statement would decrease the population to move to the left side of the classroom.
4. Ask students if they believe their statement would increase the population to move to the right side of the classroom.
5. Count the number of students on both sides of the classroom and record on the board.
6. Ask students to determine if the total population increased or decreased.
7. Have students read out some of their statements and classify them as factors that

either increase or decrease a population.

8. Explain to students that they will learn more about factors that affect population growth through the lesson.

Explore (30 minutes):

1. Have your students sign into [Legends of Learning](#). Instruct students to complete the Instructional playlist.
2. As students complete the assigned games, students will complete the Factors Influencing Growth of Individuals and Populations Worksheet.
3. Circulate as students work through the playlist and complete the handout. Listen for evidence of understanding and use this opportunity to correct any misconceptions.

Explain (20 minutes):

1. Review answers to the Factors Influencing Growth of Individuals and Populations Worksheet by drawing a trophic pyramid on the board.
2. Ask students to volunteer answers for each level to complete the pyramid
3. Relate student knowledge to the activity at the beginning of class.
 - a. If there is a decrease in one population in the community, how will that affect other members in the community? Give an example. (will cause a decrease in other populations, for example, if the herbivore population suddenly decreases, the snake population that feeds on small herbivores would decrease)
 - b. What are some ways that humans can cause a population change? (environmental impacts: air, water pollution, habitat destruction, deforestation, overpopulation)
 - c. Why is a healthy producer population important to overall population stability in a community? (producers are at the lowest trophic level and provide a food source to herbivores and omnivores)
 - d. What does it mean when a population reaches its carrying capacity? (population is at the maximum the community can support)
 - e. What are the 6 basic things that every living thing requires? (air, food, sunlight, water, shelter, space)

Elaborate (5 minutes):

1. Explain to students that communities and ecosystems are composed of many different populations that interdependent with each other and that changes in resource availability in one population affects other populations and overall ecosystem health.
2. Show this [video](#) of global urban population increase over the last 65 years.
3. Ask students to describe what the video is showing, and how the population increase will affect humans living in the most overpopulated regions?
 - a. Answer: Resources needed by all life will become scarce. The population explosion already threatens access to food, clean water, clean air, adequate shelter, and space.

Evaluate (10 minutes):

1. Have your students sign into [Legends of Learning](#). Instruct students to complete the Content Review playlist.
2. [Analyze student results](#) to access topics that may require 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.



Resource Availability Statements for Engagement Activity

Directions: One statement per index card, one index card per student. You may repeat statements as needed to meet your class size.

You are a wolf, and your favorite meal, the fox, is booming!!

You are a rabbit. Drought hits! Producers die off by 50%!!

New organic fertilizer increases corn crop yield by 50%, and you are a snake!

Pollution from a nearby factory contaminates water used to irrigate crops!

Population boom! Meet your new neighbors!! Lots of them!!

You have the plague! Spread it around!

New safe pesticide increases crop yields by 50%!

Sustainable fishing practice saves fish supply!

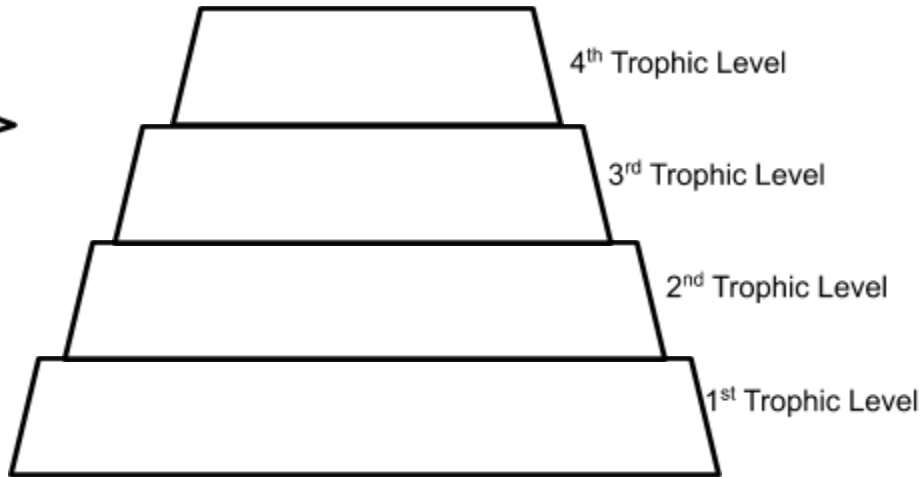
Sustainable agriculture prevents soil erosion, more trees take root!

Factors Influencing Growth of Individuals and Populations

Name: _____

Directions: While playing the games in Legends of Learning, use what you learn to complete the assignment below.

Part 1. Write the name of the plant or animal in the correct trophic level. The choices are in the box below. Hint: Producers belong in the first trophic level.



wolf	caterpillar	willow tree	rabbit	mouse
snake	grass	owl	eagle	butterfly

Part 2: Predicting the outcome. Write if the population will decrease or increase on the line next to the statement.

- The community reaches carrying capacity. _____
- The producer population increases. _____
- Access to water and adequate shelter is threatened. _____

