

Lesson 4.5: Extinctions and Human Impacts

Natural selection can cause a population to change in response to a changing environment. But what if the environment changes drastically or suddenly? Does natural selection always work to allow populations to survive? In this lesson, you'll investigate causes and effects of mass extinctions.

Vocabulary

- adaptive trait
- cause
- climate change
- effect
- environment
- extinct
- human activities
- mass extinction
- natural selection
- organisms
- population
- prediction
- species

Digital Tools

- *Earth's Changing Climate* Simulation

Name: _____

Date: _____

Warm-Up

Think about the changes you can make in the *Natural Selection* Sim.

1. What do you think could cause a population to die out in the Sim?

Reading “The Limits of Natural Selection”

1. Read and annotate the article, “The Limits of Natural Selection.”
2. Choose and mark annotations to discuss with your partner. Once you have discussed these annotations, mark them as discussed.
3. Now, choose and mark a question or connection, either one you already discussed or a different one you still want to discuss with the class.
4. Answer the reflection questions below.

Why might a species go extinct rather than just adapt?

What do scientists say caused most of the species of the dinosaurs to become extinct?

Active Reading Guidelines

1. Think carefully about what you read. Pay attention to your own understanding.
2. As you read, annotate the text to make a record of your thinking. Highlight challenging words and add notes to record questions and make connections to your own experience.
3. Examine all visual representations carefully. Consider how they go together with the text.
4. After you read, discuss what you have read with others to help you better understand the text.

Name: _____

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Investigating Climate Change in the *Earth's Changing Climate Simulation*

Part 1: Investigating in the *Earth's Changing Climate Simulation*

Goal: Perform tests in the Sim to change Earth's climate by increasing or decreasing Earth's temperature.

Do:

- Open the *Earth's Changing Climate Simulation*
- Select Human Activities mode from the menu on the left.
- Open the graph.
- Adjust human activities to try to increase or decrease Earth's temperature (decide with your partner who will increase and who will decrease).
- When you succeed at the mission, answer the questions below.
- If you have time, restart the Sim and run more tests.

Tips:

- Open the graph by pressing the graph icon in the lower left corner and be sure Temperature is selected.
- After making a change, let the Sim run for at least 50 time units before recording observations.
- You may wish to start by changing only one factor at a time before changing multiple factors.
- Reset the Human Activities mode using the circular arrow in the upper right hand corner before you run another test or test a different factor.

1. Did you increase or decrease Earth's temperature? _____

2. What changes did you make in the Sim? (check all that apply)

- | | | |
|---|---|--|
| <input type="checkbox"/> increased population | <input type="checkbox"/> increased livestock | <input type="checkbox"/> increased gas capture |
| <input type="checkbox"/> decreased population | <input type="checkbox"/> decreased livestock | <input type="checkbox"/> decreased gas capture |
| <input type="checkbox"/> increased combustion | <input type="checkbox"/> increased forest cover | |
| <input type="checkbox"/> decreased combustion | <input type="checkbox"/> decreased forest cover | |

Investigating Climate Change in the *Earth's Changing Climate Simulation* (continued)

Part 2: Discussing with a partner

- Share the results from your Sim test with your partner.
- Work with your partner to write about what you think can cause Earth's temperature to increase and decrease.

3. What human activities can cause Earth's temperature to *increase*?

4. What human activities can cause Earth's temperature to *decrease*?

Name: _____

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Reflection

Reread the last paragraph of the article, “The Limits of Natural Selection,” and then work with a partner to answer the question below.

What are some of the effects of Earth’s rising temperature?
