



**High School Science Virtual Learning**

**Earth Science**

**Natural Climate Change**

**May 07, 2020**



# High School Earth Science

## Lesson: May 07, 2020

### **Objective/Learning Target:**

Students will be able to identify factors that contribute to natural climate change.



Let's Get Started:

**Read: Natural Climate Cycles**

[Link to page](#)

**Questions:**

1. What is responsible for millennial climate cycles?
2. What types of conditions are responsible for interannual to decadal climate cycles?



## Let's Get Started: **Answer Key**

1. Question 1- Major glacial (cold) and interglacial (warm) periods are initiated by changes in the Earth's orbit around the Sun, called Milankovitch cycles.
2. Question 2 - El Niño, La Niña, Pacific Decadal Oscillation, Atlantic Multi-decadal Oscillation



## Lesson Activity: **Natural Climate Change**

**Directions:** Watch “The History of Climate Cycles Explained”

[Link to Video](#)

Complete the guided reading questions on the following slide.

1. What causes the climate to change over time and cycle between warm and cold periods?
2. About how much variation in angle of tilt does Earth's axis over time?
3. How does the eccentricity of Earth's orbit affect the seasons of the year?
4. How does data from ice core samples match up with the Milankovitch cycles?
5. How does the albedo of ice sheets affect Earth's climate?



## Lesson Activity: **Natural Climate Change**

**Directions:** *Watch - “A History of Earth’s Climate”*

[Link to video](#)

Complete the guided reading questions on the following slide.

1. How does the amount of oxygen versus carbon dioxide in the atmosphere affect climate?
2. What role did cyanobacteria play in climate change?
3. What role did a meteor impact 65 million years play in climate change?
4. What type of period are we currently in, *ice age* or *ice-free age*?





# Answers

1. What causes the climate to change over time and cycle between warm and cold periods? **Earth's position in space, amount of tilt, and direction of tilt.**
2. About how much variation in angle of tilt does Earth's axis over time? **22.1 to 24.5 degrees**
3. How does the eccentricity of Earth's orbit affect the seasons of the year? **The changing eccentricity of the orbit lengthens or shortens the seasons.**
4. How does data from ice core samples match up with the Milankovitch cycles? **It doesn't. The presence of ice on Earth actually lengthens the cycles from about 41,000 years to 100,000 years.**
5. How does the albedo of ice sheets affect Earth's climate? **It reflects more sunlight causes the warming process to occur much more slowly.**

1. How does the amount of oxygen versus carbon dioxide in the atmosphere affect climate? **More oxygen produces cooler climate, more carbon dioxide produces warmer climate.**
2. What role did cyanobacteria play in climate change? **Produced large amounts of oxygen while removing carbon dioxide..**
3. What role did a meteor impact 65 million years play in climate change? **Projected large amounts of material into the atmosphere blocking sunlight and causing a cooling period.**
4. What type of period are we currently in, *ice age* or *ice-free age*? **We are currently in an ice age, likely nearing its end.**

## Extensions:

**Webpage** “Global Warming Natural Cycle”

[Link to Page](#)

- Read the information and watch the videos posted on the page.
- 1. List several natural factors that affect climate.
- 2. How has man changed the natural fluctuations in climate change?

## Extension Answers

List several natural factors that affect climate. **Earth's changing tilt, changing orbital positions, changes in the Sun's solar output, effects of volcanoes, meteor impacts, ocean currents (El Nino, La Nina), natural changes in greenhouse gases (methane, oxygen, carbon dioxide, water vapor).**

How has man changed the natural fluctuations in climate change? **Man has altered the natural cycles of warming and cooling by introducing huge amounts of carbon dioxide back into the atmosphere over a short period of time.**