

# 41.1 Climate and Climate Change



Summarize main points from each video.

Video Title / topic \_\_\_\_\_

Video Title / topic \_\_\_\_\_

Video Title / topic \_\_\_\_\_

# Topic Introduction



**Summarize your understanding of each paragraph.**

Climate change is a change in the statistical distribution of weather patterns when that change lasts for an extended period of time (i.e., decades to millions of years).

Climate change is caused by factors such as biotic processes, variations in solar radiation received by Earth, plate tectonics, and volcanic eruptions.

Certain human activities have been identified as primary causes of ongoing climate change, often referred to as global warming - the observed century-scale rise in the average temperature of the Earth's climate system and its related effects.

Scientists actively work to understand past and future climate by using observations and theoretical models. A climate record—extending deep into the Earth's past—has been assembled, and continues to be built up, based on geological evidence.

# Read/Summarize Text



1. Read the passage.
2. Underline key expressions in each sentence.
3. Re-write each word (or expression) you underlined.
4. Summarize the passage.

## *Climate change*

1

Evidence for climatic change is taken from a variety of sources that can be used to reconstruct past climates.

2

Reasonably complete global records of surface temperature are available beginning from the mid-late 19th century.

For earlier periods, most of the evidence is indirect—climatic changes are inferred from changes in proxies, indicators that reflect climate, such as vegetation, ice cores, dendrochronology, sea level change, and glacial geology.

[https://en.wikipedia.org/wiki/Climate\\_change#Human\\_influences](https://en.wikipedia.org/wiki/Climate_change#Human_influences)

## *Re-write words you underlined*

3

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## *Using a complete sentence, summarize or rephrase the passage*

4

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# Read Text for Comprehension

Read this article for deeper understanding. No summary is required, although you may want to circle, underline, or mark key ideas and words.

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## **Wikipedia Article: Ice Core**

An ice core is a core sample that is typically removed from an ice sheet or a high mountain glacier. Since the ice forms from the incremental buildup of annual layers of snow, lower layers are older than upper, and an ice core contains ice formed over a range of years. Cores are drilled with hand augers (for shallow holes) or powered drills; they can reach depths of over two miles (3.2 km), and contain ice up to 800,000 years old.

The physical properties of the ice and of material trapped in it can be used to reconstruct the climate over the age range of the core. The proportions of different oxygen and hydrogen isotopes provide information about ancient temperatures, and the air trapped in tiny bubbles can be analyzed to determine the level of atmospheric gases such as carbon dioxide. Since heat flow in a large ice sheet is very slow, the borehole temperature is another indicator of temperature in the past. These data can be combined to find the climate model that best fits all the available data.

Impurities in ice cores may depend on location. Coastal areas are more likely to include material of marine origin, such as sea salt ions. Greenland ice cores contain layers of wind-blown dust that correlate with cold, dry periods in the past, when cold deserts were scoured by wind. Radioactive elements, either of natural origin or created by nuclear testing, can be used to date the layers of ice. Some volcanic events that were sufficiently powerful to send material around the globe have left a signature in many different cores that can be used to synchronize their time scales.

Ice cores have been studied since the early 20th century, and several cores were drilled as a result of the International Geophysical Year (1957–1958). Depths of over 400 m were reached, a record which was extended in the 1960s to 2164 m at Byrd Station in Antarctica. Soviet ice drilling projects in Antarctica include decades of work at Vostok Station, with the deepest core reaching 3769 m. Numerous other deep cores in the Antarctic have been completed over the years, including the West Antarctic Ice Sheet project, and cores managed by the British Antarctic Survey and the International Trans-Antarctic Scientific Expedition.

In Greenland, a sequence of collaborative projects began in the 1970s with the Greenland Ice Sheet Project; there have been multiple follow-up projects, with the most recent, the East Greenland Ice-Core Project, expected to complete a deep core in east Greenland in 2020.

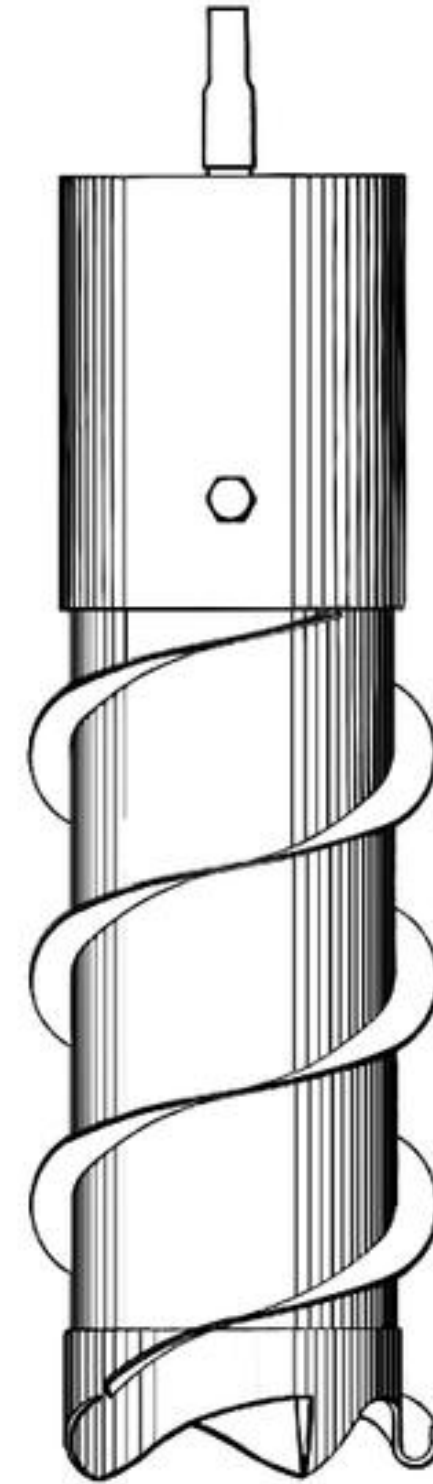
# Draw Illustration



**Copy and Label the Illustration in the Space Provided**

## **Illustration**

Ice auger patented in 1932; the design is very similar to modern augers used for shallow drilling.



[https://en.wikipedia.org/wiki/Ice\\_core](https://en.wikipedia.org/wiki/Ice_core)

**Draw (Copy) the Illustration Here**

# Interpret a Graph



Write the title of the graph \_\_\_\_\_

Circle the type of chart this represents

*Bar Chart   Line Chart   Pie Chart   Other*

If applicable,

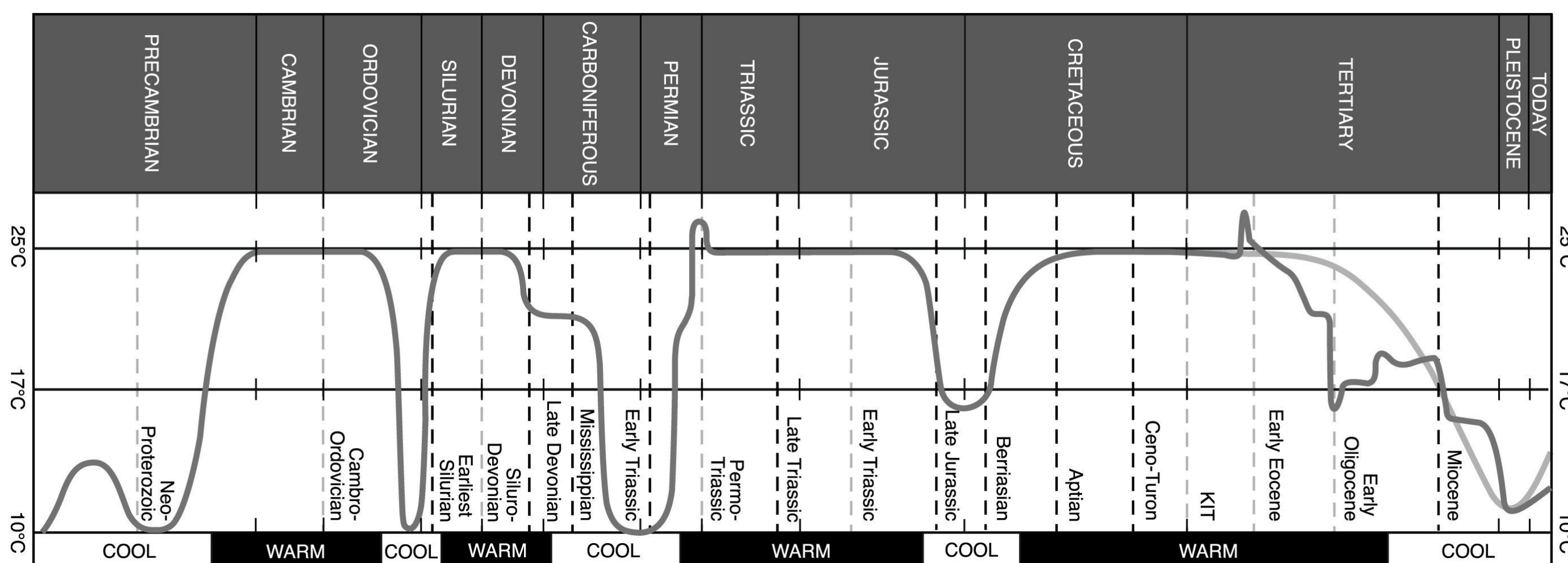
What does the X-axis represent \_\_\_\_\_

What does the Y-axis imply \_\_\_\_\_

Summarize what this graph represents or conveys

<https://scimedскеptic.files.wordpress.com/2012/11/fig-1horiz.jpg>

Figure 1



# Show-Off Your Smarts!



## Instructions

- Write complete sentences. Draw one diagram to visually support each of your responses.
- In your responses, make use of Critical Thinking skills (Technique Topic 14) and Creative Concepts skills (Technique Topic 15).

**Q1. In what way would someone 100 years ago viewed the current debate regarding carbon dioxide (CO<sub>2</sub>) emissions from coal-fired electric power plants?**

**Q2. In what do you predict someone living 100 years in the future might view the current debate regarding CO<sub>2</sub> emissions.**

# Make a Poster Based on This Topic

In the space provided here, create/draw two illustrations. Use a pyramid or relationship diagram for the top illustration. Use a process, timeline, or cyclical diagram for the second illustration.

**Pyramid or Relationship Diagram**

**Process, Timeline, or Cyclical Diagram**