



## Activity 2.4: Causes and Effects of Climate Change

**Grades 7 – 9**

**Description:** This activity will give students an opportunity to work alone and in groups to summarize what they have learned so far about climate change. Students complete this organizer in preparation for the assessment essay: Reflection on Evidence of Climate Change.

**Time:** 30 minutes

### Materials

- Computers with internet access
- Books and other resources students can use for research
- Student work and/or journals from unit 1 and unit 2 activities
- LCD or overhead projector with slide of Climate Change Organizer
- Copies of the Climate Change Causes and Effects Graphic Organizer student handout (one per group or per student)
- Pens or pencils

### National Science Education Standards

**A1.D** Develop descriptions, explanations, predictions, and models using evidence.

**A1.E** Think critically and logically to make the relationships between evidence and explanations.

### AAAS Benchmarks

**4B/M14:** The Earth has a variety of climates, defined by average temperature, precipitation, humidity, air pressure, and wind, over time in a particular place.

**4B/H5** Climatic conditions result from latitude, altitude, and from the position of mountain ranges, oceans, and lakes. Dynamic processes such as cloud formation, ocean currents, and atmospheric circulation patterns influence climates as well.

### Guiding Questions

- What are the causes and effects of climate change?
- Which causes are natural and which are caused by humans?

### Assessments

- Causes and effects graphic organizer
- Reflection on Evidence of Climate Change: Persuasive Writing

### Procedure:

1. Hand out the sheet titled “Climate Change Causes and Effects Graphic Organizer” (two versions are provided for you to choose from). Hand out past student work and/or journals.
2. Let students know that this is an activity for reviewing what they have learned and brainstorming what they will learn in the coming units, so they shouldn’t be afraid of writing down what they think. If necessary, review the differences between “causes” and “effects.”
3. Ask students to quietly read the directions and begin filling out the sheet on their own.



## CHICAGO BOTANIC GARDEN

4. After students have had some time to work on the handouts on their own, have them pair up and discuss their sheets with a partner. Students can use web or paper resources to supplement their discussion. They can make changes to their sheets at this time.
5. Lastly, have the class work together as a whole to fill out the sheet. It would be helpful to have an overhead slide of the handout that you can fill in as a class. Student work should be saved in their portfolios.

### Extension

Have students research climate deniers on the internet. Have them make a list of different arguments climate deniers use and then have them use what they have learned so far in Units 1 and 2 to address those arguments. Some websites students can use to find out how to answer climate denier arguments include:

- <http://www.skepticalscience.com/> summarizes and counters climate skeptic arguments
- <http://grist.org/series/skeptics/> articles in “How to Talk to a Climate Skeptic,” a series by Coby Beck containing responses to the most common skeptical arguments on global warming
- <http://www.policymic.com/articles/84887/bill-nye-responds-to-7-real-arguments-made-by-climate-change-deniers> Bill Nye Responds to 7 Real Arguments Made by Climate Change Deniers
- <http://environment.yale.edu/climate-communication/> Six Americas and Yale project on climate change communication

### Web Resources

Causes of Climate Change

<http://climate.nasa.gov/causes>

<http://climate.nasa.gov/climatechangeFAQ>

<http://spark.ucar.edu/shortcontent/why-climate-changing-today>

<http://co2now.org/Know-the-Changing-Climate/Climate-System/ipcc-faq-human-natural-causes-climate-change.html>

[http://www.wmo.int/pages/themes/climate/causes\\_of\\_climate\\_change.php](http://www.wmo.int/pages/themes/climate/causes_of_climate_change.php)

<http://www.nwf.org/Wildlife/Threats-to-Wildlife/Global-Warming/Global-Warming-is-Human-Caused.aspx>

<http://oceanservice.noaa.gov/education/pd/climate/factsheets/howhuman.pdf>

<http://www.epa.gov/climatechange/>

Effects of Climate Change

<http://climate.nasa.gov/effects>

[http://www.windows2universe.org/earth/climate/cli\\_effects.html](http://www.windows2universe.org/earth/climate/cli_effects.html)

<https://spark.ucar.edu/shortcontent/what-earth-does-climate-change-impact>

<http://climate.nasa.gov/>

<http://www.nwf.org/Wildlife/Threats-to-Wildlife/Global-Warming/Effects-on-Wildlife-and-Habitat.aspx>

[http://www.bgei.org/climate/climate\\_change\\_effects/](http://www.bgei.org/climate/climate_change_effects/)

<http://www.epa.gov/climatestudents/impacts/effects/ecosystems.html>



<http://www.epa.gov/climatechange/impacts-adaptation/agriculture.html>  
<http://www.epa.gov/climatechange/impacts-adaptation/health.html>  
<http://www.niehs.nih.gov/research/programs/geh/climatechange/>  
<http://www.who.int/mediacentre/factsheets/fs266/en/>

**Assessment**

Hand out the worksheet entitled “Reflection on Evidence of Climate Change: Persuasive Writing.” Give students some in-class time to work on their reflections, or assign the reflections for homework. Responses can be shared with the class, or handed in to the teacher. Reflections should be kept as part of each student’s portfolio.

**Rubric: Reflection on Evidence of Climate Change, Persuasive Writing**

Concept	Low	Medium	High
Differentiates between cause and effect in the context of climate change	Does not differentiate between a cause and effect.	Differentiates between cause and effect, and correctly identifies which causes lead to which effects.	Differentiates between cause and effect and describes in detail the connections between each cause they list and its effects. Understands that there are different levels of confidence in making connections between cause and effect.
Uses evidence to support a conclusion	Makes statements without providing supporting evidence	Supports statements with evidence, but does not explain how the evidence supports the statement. Provides at least two pieces of supporting evidence	Supports statements with evidence, explains how the evidence supports the claim, and notes how reliable the evidence is. Provides multiple pieces of supporting evidence. Takes into account and addresses challenges to a claim.
Differentiates between natural and human causes of climate change	States that there are natural and human causes, but does not differentiate between them.	States that there are natural and human causes, and illustrates this difference with at least one example of each.	States that there are natural and human causes, and illustrates this difference with multiple examples of each.
Differentiates between the types of effects of climate change (plants, animals, humans)	Notes the effects of climate change but does not differentiate or describe the differences on plants, animals, or humans.	Notes the effects of climate change and describes how they affect at least one of the categories of living things.	Notes the effects of climate change and describes how they affect all three categories of living things.



Name: \_\_\_\_\_ Date: \_\_\_\_\_ Room: \_\_\_\_\_

## Climate Change Causes and Effects Graphic Organizer

Under “causes,” write down what you think makes climate change occur. Under “effects,” write what you think happens because of climate change. In the “questions” box, note any questions you have, or things you would like to know about the causes and effects of climate change.

**Causes**


**Effects**


→  
**Climate  
Change**  
→

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**Questions**



Name: \_\_\_\_\_ Date: \_\_\_\_\_ Room: \_\_\_\_\_

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### Causes

*Natural Causes*

*Human-Based Causes*



### Effects

*Effects on plants*

*Effects on animals*

*Effects on humans*

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### Questions



Name: \_\_\_\_\_ Date: \_\_\_\_\_ Room: \_\_\_\_\_

## Reflection on Evidence for Climate Change: Persuasive Writing

**Instructions:** Many people do not know that there is evidence for climate change right now. Instead, they think we will not see any results of climate change for hundreds of years. Write a persuasive letter to a government official about the evidence for climate change.

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