

# Human Impact: Climate Change

Name:

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Teacher:

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Class:

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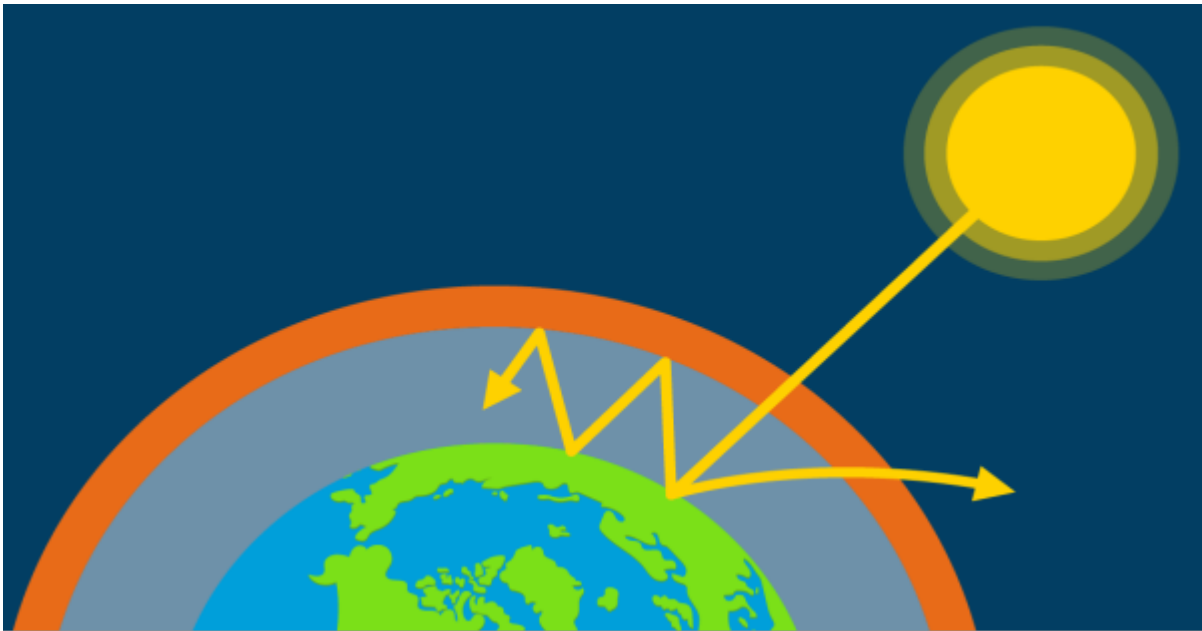
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**Earth and Space Science**  
**Unit 4**  
Exit Tickets

# Lesson 2 Exit Ticket:

## What Do Greenhouse Gases Do to the Environment?

1. If humans increase the amount of carbon dioxide in Earth's atmosphere, what will happen to the average temperature on Earth? Read the statements below and (✓) the correct response. [1]
  - The average temperature on Earth will increase because the concentration of greenhouse gases will decrease.
  - The average temperature on Earth will decrease because the concentration of greenhouse gases will decrease.
  - The average temperature on Earth will increase because the concentration of greenhouse gases will increase.
  - The average temperature on Earth will decrease because the concentration of greenhouse gases will increase.
2. Explain how the greenhouse effect both *benefits and harms* Earth. [2]



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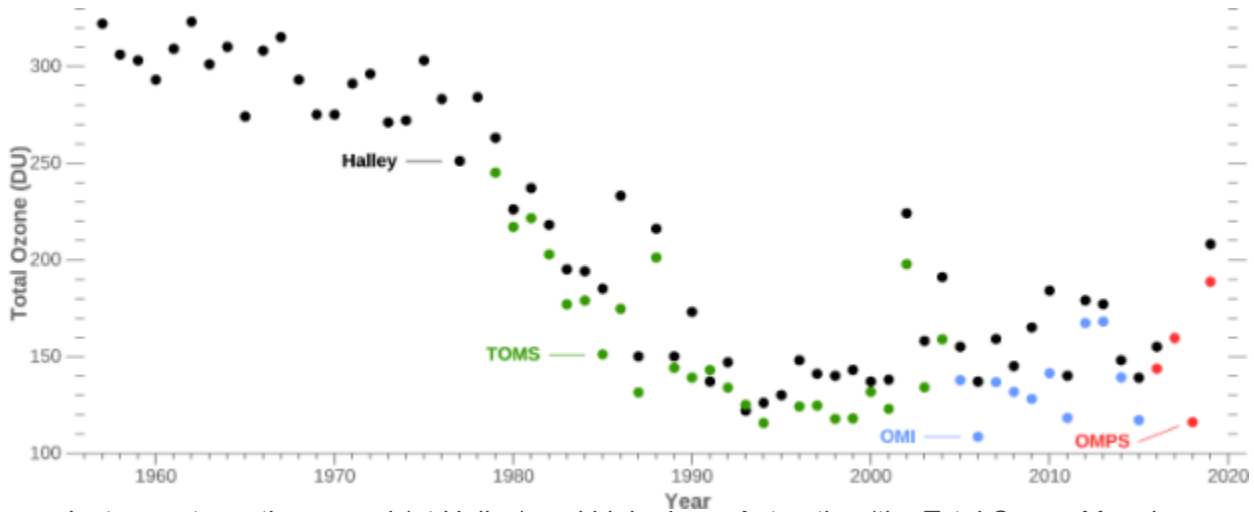
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**Lesson 2**

3. If there were no greenhouse gases in the atmosphere what would the Earth be like? [1]
- A. Extremely hot
  - B. Warm
  - C. Cool
  - D. Extremely cold

# Lesson 3 Exit Ticket: What Is Natural Climate Variation?

The graph below shows the total ozone above Antarctica as measured by different instruments between 1957 and 2019.



*Instruments on the ground (at Halley) and high above Antarctica (the Total Ozone Mapping Spectrometer [TOMS] and Ozone Monitoring Instrument [OMI]) measured an acute drop in total atmospheric ozone during October in the early and middle 1980s. (Halley data supplied by J. D. Shanklin, British Antarctic Survey.)*

After analyzing the total ozone (a gas in the atmosphere that absorbs ultraviolet radiation from the Sun), the following claim was made:

*“Ozone loss in Antarctica from 1957 to 2019 was most likely caused by natural climate variation.”*

1. Evaluate the accuracy of the statement above. Include evidence and reasoning to support your response. [3]

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# Lesson 4 Exit Ticket: Where Does Carbon Come From?

1. Carbon circulates through Earth in many ways. In the box below each one, use words or drawings to represent one real-life example of this occurring. [3]

Carbon Entering the Atmosphere	Carbon Leaving the Atmosphere

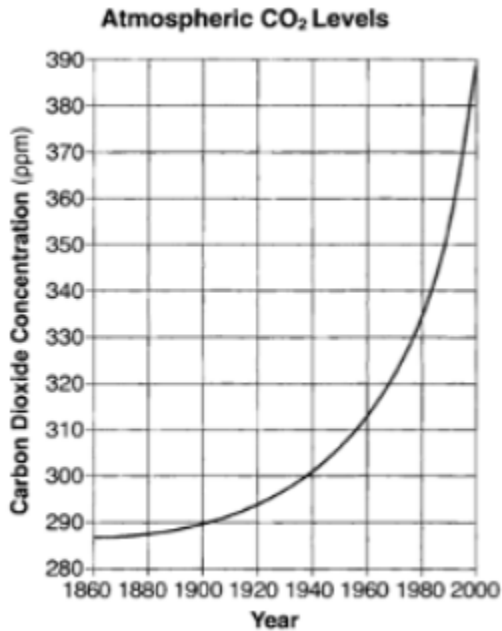
2. How have humans impacted the carbon cycle? [1]
- A. Humans have taken carbon away from the atmosphere and added it to the Earth's surface.
  - B. Humans have taken away carbon from the Earth's surface and added it to the atmosphere.
  - C. Humans have decreased the total amount of carbon in the cycle.
  - D. Humans have increased the total amount of carbon in the cycle.

*Exit ticket continues on the next page!*

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## Lesson 4

The below shows changes in carbon dioxide concentrations in Earth's atmosphere over a 140-year period. Carbon dioxide concentrations are shown in parts per million (ppm).



3. The significant change in CO<sub>2</sub> concentration is most likely caused by . [1]

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- A. decreased cloud coverage, and is predicted to decrease average global temperatures
- B. decreased volcanic activity, and is predicted to increase average global temperatures
- C. increased use of fossil fuels, and is predicted to increase average global temperatures

*Question Adaptation/Image Credit: NASA Goddard Institute for Space Studies (GISS) Climate Change Research Initiative (CCRI) Applied Research STEM Curriculum Unit Plan, Future Temperature Projections*

# Lesson 5 Exit Ticket:

## Model Man-Made Climate Change

Scientists often use a “carbon bathtub” as an analogy of understanding human impact on our climate system:

*The bathtub is a representation of Earth’s climate system, and the water level represents the carbon dioxide in the atmosphere. If the tub can’t drain fast enough, when too much water is added, the tub will overflow. You can’t have more water coming into the tub than is draining out the bottom.*

1. Explain how the “carbon bathtub” can be compared to human impact on climate change. Include evidence and reasoning to support your response. [3]

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# Lesson 6 Exit Ticket:

## What Will Happen to Weather

**Directions:** Read [Why Are Hurricanes Like Dorian Stalling, and Is Global Warming Involved?](#) by Inside Climate News and answer the questions that follow.

1. Based on the text, how can global warming impact hurricane speed? Include evidence and reasoning to support your response. [3]

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2. Which of the following statement(s) are true? [1]

I.	An increase in Earth's temperature will cause an increase in the amount of evaporation of the ocean during storm formation.
II.	An increase in Earth's temperature will decrease the intensity and the number of hurricanes each year.
III.	A decrease in Earth's temperature contrast between the Arctic and the equator may cause an increase in slow-moving hurricanes.

- A. Statement I only
- B. Statement II only
- C. Statement III only
- D. Statements I and III only
- E. Statements I, II, and III



# Lesson 8 Exit Ticket: What Will Happen to Human Lives?

A change in climate has many potential effects for the Earth. Three effects are identified in the “Climate Change Effect” column of the table below.

1. Complete the chart below by filling in at least one answer per box. [3]

Climate Change Effect	Resulting Impact
<i>Warmer oceans</i>	<b>Weather:</b>
<i>Ocean acidification</i>	<b>Oceans:</b>
<i>Rising sea levels</i>	<b>Land:</b>

2. Choose one answer above and describe how this impacts human interaction with the environment. [1]

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# Lesson 9 Exit Ticket: Green Energy

**Directions:** Read the information on [Tidal Energy](#) by National Geographic and answer the questions that follow.

1. Identify two advantages and two disadvantages of using tidal energy. [4]

Advantages of Using Tidal Energy	Disadvantages of Using Tidal Energy
1.          2.	1.          2.

2. Tidal energy can be classified as a [fill in] energy source. Circle the correct response below. [1]

**renewable**

**nonrenewable**

# Lesson 10 Exit Ticket: Lifestyle Changes

Identify three ways that the average person could reduce their carbon emissions. [3]

1.

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2.

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3.

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# Lesson 11 Exit Ticket: Responding to Skeptics

1. Compose an answer to the Essential Question: What will happen to the Earth if we do nothing about climate change? Include at least three pieces of evidence and reasoning to support your response. [5]

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