



**Science Virtual Learning**

**7th Grade Science**

**Air Pollution**

**April 30, 2020**



7th Grade Science  
Lesson: April 30, 2020

**Objective/Learning Target:**

I can explain the negative and positive impacts of humans on the  
Environment

**Let's Get Started!**

# Warm up!

On a sheet of paper, answer the following questions:

- 1) Why do we have seasons in the Northern Hemisphere?
- 2) If you could live anywhere in the world, where would you live and why?

# Warm-up Answer Key

- 1) We have seasons because the Earth is tilted at  $23.5^\circ$  as it revolves around the Sun!
- 2) Various answers with various reasons!

# Nat Geo Video: Air Pollution

Watch video from National Geographic. Be able to answer the following questions (time where answers are provided in the video are listed):

1. What is Air Pollution? (0:02)
2. What are the two main causes Air Pollution? (0:21)
3. Burning fossil fuels releases what type of gases? (0:41)
4. What happens to gases (carbon dioxide, methane, nitrous oxide, fluorinated gases) when they are released into Earth's atmosphere? (0:54)
5. How do Greenhouse gases lead to Global Warming? (1:00)
6. What is smog?
7. Natural sources and smog are 2 types of air pollution. What is the third type? (2:37)
8. What are solutions to Air Pollution? Why is this important?

# Nat Geo Video: Air Pollution

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5. How do Greenhouse gases lead to Global Warming? (1:00)
6. What is smog? (1:37)
- 7) Natural sources and smog are 2 types of air pollution. What is the third type? (2:37)
- 8) What are some of the health issues related to air pollution? (2:56)
- 9) What are solutions to Air Pollution (3:07)? Why is this important? (3:20)

# Answer Key to Questions from Video

1. Air pollution is the presence of chemicals and/or particles in the air that pose serious health and environmental threats.
- 2) Air pollution is caused by:
  - a) Natural sources (volcanic eruptions, wildfires and allergens (cause allergies)).
  - b) Human activities (main cause) energy use (burning of fossil fuels) and agriculture
- 3) Burning of fossil fuels releases carbon dioxide, methane, nitrous oxide, and fluorinated gases.
- 4) When these gases are released into the atmosphere, they get trapped.

# Answer Key to Questions from Video

- 5) The gases are trapped in Earth's atmosphere and cannot escape. The atmosphere warms up leading to Global Warming which then leads to Climate Change.
- 6) Smog is a type of air pollution that reduces visibility (the ability to see well) and has serious health effects.
- 7) The third type of air pollution is Toxic Pollutants: Mercury, Lead, Dioxins and Benzene
- 8) Health issues related to air pollution include cancer, reproductive issues and birth defects.
- 9) Solutions decreasing the use of fossil fuels in transportation, manufacturing and electrical generation. Leads to a cleaner environment, better human health and slows rate of Global Warming.



# Practice: Reading

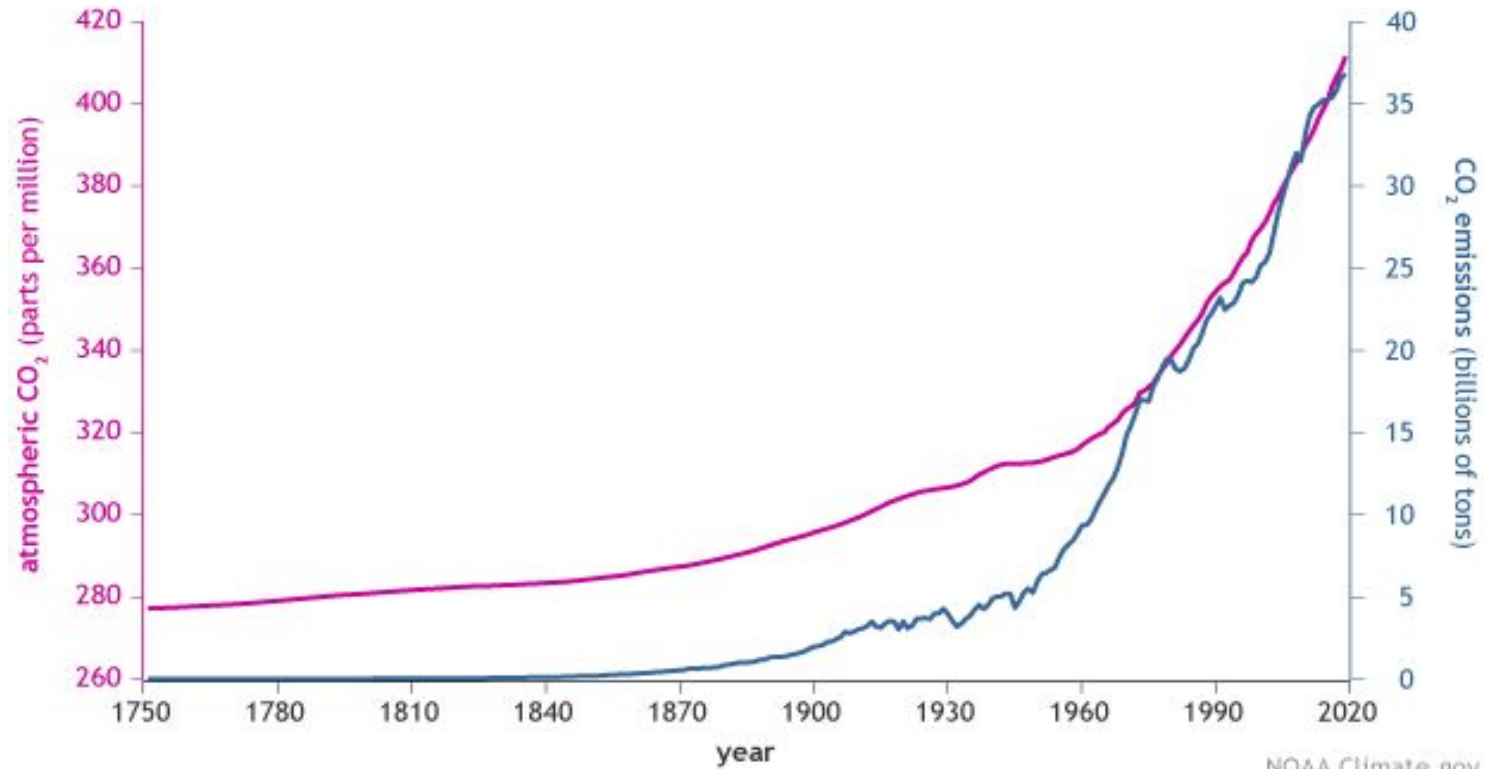
Read about [Air Pollution](#).

Then, on your sheet of paper, answer the following questions:

1. What is air pollution?
2. What's the difference between primary and secondary pollutants? Give examples of each.
3. What are three ways that polluting fossil fuels are burned?
4. Why is acid rain dangerous?

# Graph Interpretation Practice

CO<sub>2</sub> in the atmosphere and annual emissions (1750-2019)



NOAA Climate.gov  
Data: NOAA, ETHZ, Our World in Data

# Graph Interpretation Questions (slide 1)

- 1) What is the Independent variable for this double-line graph?
- 2) What are the Dependent variables? Yes. There are 2!
- 3) Reading the **PINK** line, how much carbon dioxide ( $\text{CO}_2$ ) was estimated to be in the atmosphere in 1750? Remember to read the number on the **LEFT** in **PINK**!

PS) Earlier dates are estimated because  $\text{CO}_2$  was not measured directly at that time.

# Graph Interpretation Questions (slide 2)

4. Reading the BLUE line, how much CO<sub>2</sub> was estimated to be emitted in 1750? Remember to read the numbers on the RIGHT in BLUE !

5) How much Carbon Dioxide (CO<sub>2</sub>) was estimated to be in the atmosphere in 1900?

6) When did CO<sub>2</sub> emissions begin to increase?

7) Reading the BLUE line, estimate how much emissions increased from 1930 to 2020.

# Graph Interpretation Questions (slide 3)

8. Reading the **PINK** line, estimate how much the levels of **atmospheric CO<sub>2</sub>** increased from 1930-2020.

9) What do you think? Is there a relationship / connection between the rise of **CO<sub>2</sub> emissions** and **CO<sub>2</sub> levels in the atmosphere** over time?

# Graph Interpretation Answer Key

- 1) Independent variable: Years
- 2) Dependent variables: a) Atmospheric CO<sub>2</sub> in parts per million (ppm) b) CO<sub>2</sub> Emission in billions of tons (bt)
- 3) Atmospheric CO<sub>2</sub> in 1750: 277 parts per million (ppm)
- 4) Estimated CO<sub>2</sub> Emitted in 1750: 260 billions of tons (bt)
- 5) Carbon Dioxide (CO<sub>2</sub>) was estimated to be 290 parts per million in 1900.
- 6) CO<sub>2</sub> emission started to increase in 1845 (approximately)
- 7) Emissions increased from 4 bt in 1930 to 34 bt in 2020
- 8) Levels of Atmospheric CO<sub>2</sub> appeared to increase from approximately 300 ppb in 1930 to 410 ppb in 2020.
- 9) Yes. There is a relationship between the increase in Atmospheric CO<sub>2</sub> and the rate of CO<sub>2</sub> Emissions over time..