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## My NASA Data - Lesson Plans

### Monitoring Ozone in the Great Lakes Region



#### Overview

NASA makes observations and collects data about ozone in the Great Lakes region. Read about the research and analyze related data.

#### Materials Required

1. Online or printed copy of student sheets.
  - [Monitoring Ozone in the Great Lakes Region Student Sheets](#)

#### Technology Requirements

- One-to-One (tablet, laptop, or CPU)
- One-to-a-Group
- Teacher computer/projector only

#### Teacher Background Information

Use the following resources as background information:

- [Tracking Ozone Pollution in the Great Lakes Region | NASA Applied Sciences](#)
- [Great Lakes Air Quality \(ladco.org\)](#)
- [2015 Ozone NAAQS Emission Inventory State Implementation Plan \(michigan.gov\)](#)

#### Procedure

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## Monitoring Ozone in the Great Lakes Region

### Part One

Modified from: [NASA Aids Study of Lake Michigan High-Ozone Events | NASA](#)

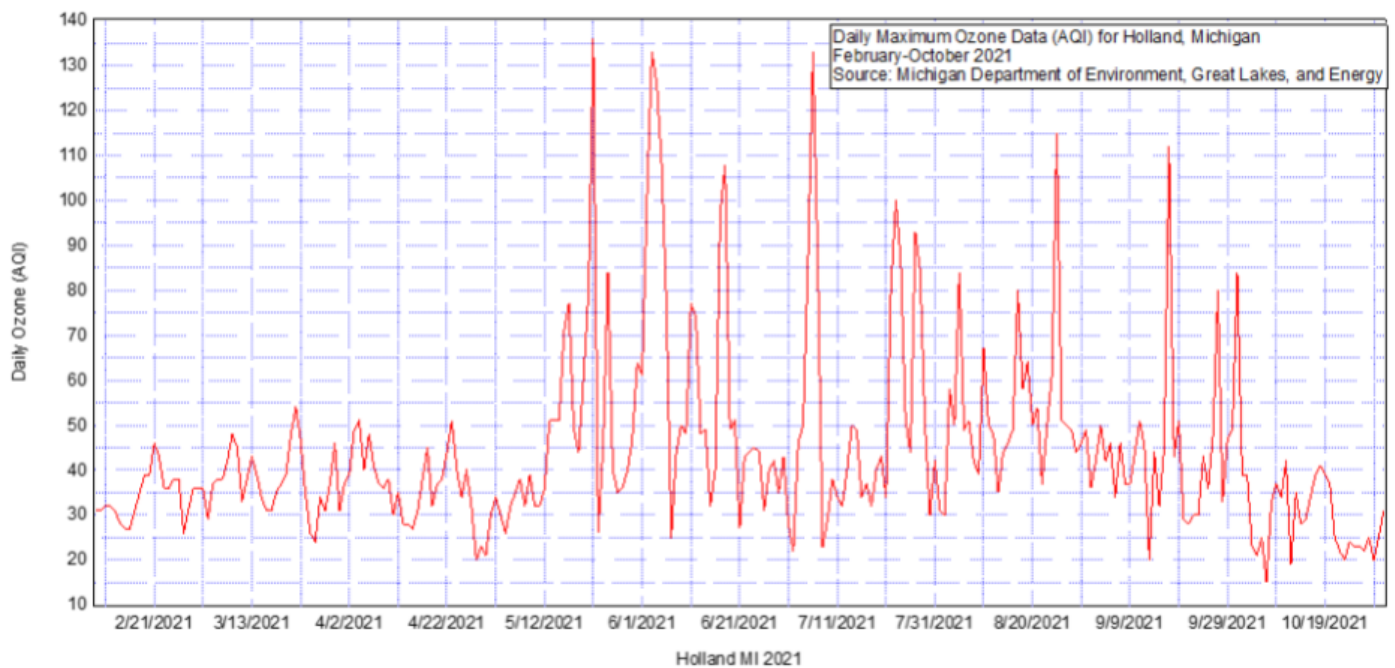
1. Read through the copy of the article in the [Monitoring Ozone in the Great Lakes Region Student Sheets](#) and study the images.
2. Using a highlighter, identify and mark the following in different colors. Identify the color used for each question.
  - Who is conducting this research?
  - How does ozone impact human health?
  - Why is this research needed?
  - What satellite is also going to help with this research?

### Part Two

Modified from: [Great Air Quality for the Great Lakes | NASA](#)

1. Read through the copy of the article in the [Monitoring Ozone in the Great Lakes Region Student Sheets](#) and study the images.
2. Using a highlighter, identify and mark the following in different colors. Identify the color used for each question.
  - Who is conducting this research?
  - Why is this research needed?
  - What are these scientists doing?
  - Where is this research taking place?

### Part Three



### [Daily Ozone for Holland, MI February through October 2021](#)

Credit: My NASA Data

Data from: Michigan Department of Environment Great Lakes and Energy

(<https://mynasadata.larc.nasa.gov/sites/default/files/inline-images/Monitoring%20Ozone%20in%20the%20Great%20Lakes%20Graph.png>)

1. Study the [graph](#) and find the information needed to answer the questions.
  1. What pollutant data is recorded on this graph?
  2. Which months had the highest values?
  3. Which months had the lowest values?
  
4. If the data is used to determine AQI, which days had values above 130?

Air Quality Index		
AQI Category and Color	Index Value	Description of Air Quality
Good Green	0 to 50	Air quality is satisfactory, and air pollution poses little or no risk.
Moderate Yellow	51 to 100	Air quality is acceptable. However, there may be a risk for some people, particularly those who are unusually sensitive to air pollution.
Unhealthy for Sensitive Groups Orange	101 to 150	Members of sensitive groups may experience health effects. The general public is less likely to be affected.
Unhealthy Red	151 to 200	Some members of the general public may experience health effects; members of sensitive groups may experience more serious health effects.
Very Unhealthy Purple	201 to 300	Health alert: The risk of health effects is increased for everyone.
Hazardous Maroon	301 and higher	Health warning of emergency conditions: everyone is more likely to be affected.

### [Air Quality Index Values](#)

Credit: EPA

[https://mynasadata.larc.nasa.gov/sites/default/files/inline-images/AQI%20Index\\_0.png](https://mynasadata.larc.nasa.gov/sites/default/files/inline-images/AQI%20Index_0.png)

- Using the EPA's AQI scale, what is the rating for the days above 130? How many days appear to be above the "good" rating?
- This graph only displays one spring-fall seasonal period. If the late fall-winter months were included, what do you predict would be the most likely AQI rating in those months? How did you determine your answer?
- More years of data would provide more complete data for analysis. If more data was provided, what would be a scientific question to ask that cannot be answered with only one year of data?
- Based on this information and the previous information in the reading, why should ozone be studied in the Great Lakes Region?

Teachers who are interested in receiving the answer key, please complete the [Teacher Key Request and Verification Form](#). We verify that requestors are teachers prior to sending access to the answer keys as we've had many students try to pass as teachers to gain access.

