# My NASA Data - Interactive Models

# Stability and Change of COVID-19 and Nitrogen Dioxide

## Grade Band

- 6-8
- 9-12

## Time

- 30 minutes

## Directions

1. Using an internet accessible device, students open the link to the Stability and Change of COVID-19 and Nitrogen Dioxide Interactive Model to begin their exploration of this phenomenon.
2. Distribute the Stability and Change of COVID-19 and Nitrogen Dioxide Interactive Model Student Sheet (optional). Have students navigate on their own through the interactive model to answer the questions and complete the activities on their student sheet.

## Global Air Column Concentration of Nitrogen Dioxide

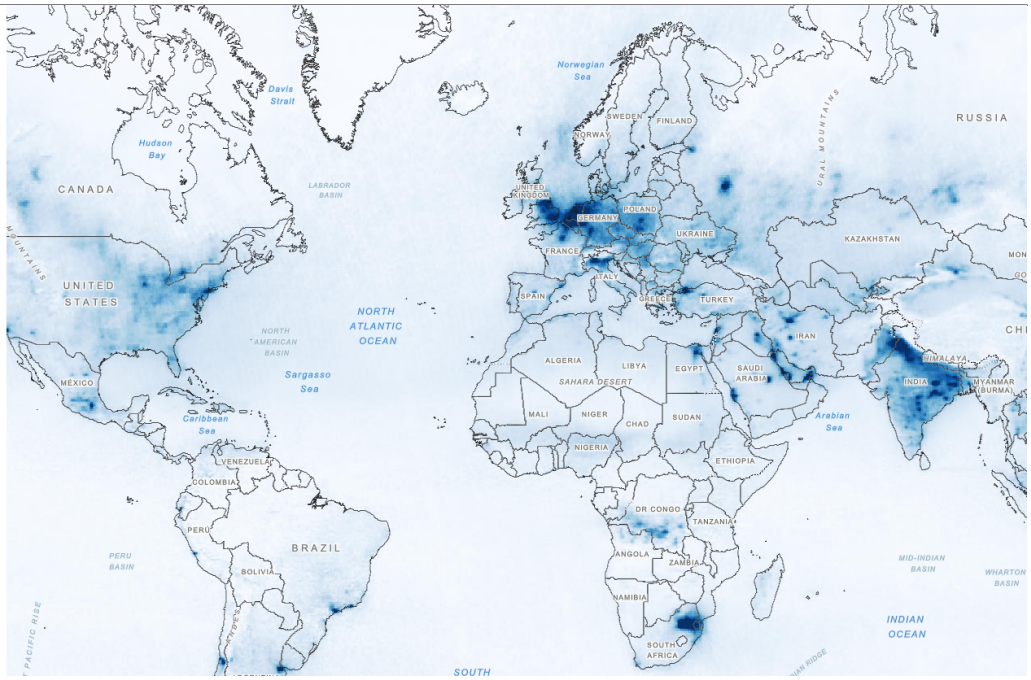
Tropospheric Concentration of Nitrogen Dioxide
($10^{15}$ molecules per square centimeter)

0 2.5 5

The map to the right displays the average global air column concentration of nitrogen dioxide during May between the years of 2015 and 2019, before the first outbreaks of COVID-19 in the United States.

Nitrogen dioxide is a pollutant, whose primary sources are from the burning of fossil fuels, automobiles, and factories.

Once in the air, it can aggravate respiratory conditions in humans, especially those with asthma, leading to an increase of symptoms




CLICK HERE

## Teacher Note

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.

## NGSS Three Dimensional Learning

### NGSS Disciplinary Core Ideas

- ESS2D: Weather and Climate
- ESS3C: Human Impacts on Earth Systems

### Crosscutting Concepts

- Patterns
- Systems and System Models
- Stability and Change

### Science and Engineering Practices

- Developing and Using Models
- Analyzing and Interpreting Data
- Using Mathematics and Computational Thinking
- Engaging in Argument from Evidence

## Learning Objectives

- Students will analyze and describe nitrogen dioxide at different spatial and temporal scales.
- Students will describe the stability of nitrogen dioxide as it relates to changes in human behavior.

## Essential Questions

- How does nitrogen dioxide vary across space and time?
- What effect do humans have on nitrogen dioxide concentrations in the atmosphere?
- How is the spread of COVID-19 related to nitrogen dioxide concentrations?

## Google Docs Interactive Files

Guide to Using Google Forms with My NASA Data