My NASA Data - Lesson Plans

Air Quality Index Tracking

Grade Band

- 9-12

Time

- 90 minutes

Overview

Students interpret AQI maps and charts to compare today's AQI with the past five days. Using the EPA's air quality activity guides, students create an update for their school or residents of their region providing key information related to today's AQI.

Materials Required

- Devices with any weather app (1-2 per student group)
- Air Quality Index Data Sheet (printed- 1 per student)
- Air Quality Index (AQI) Basics (1 per student)
- AirNow Interactive Map Tutorial (printed- 1 per student)
- AirNow Interactive Map (to view)
- AQI Update template (to edit)
- Activity guides
- Colored pencils (green, yellow, orange, red, purple)
- Colorful pieces of paper or sentence strip (1 per student group)

Procedure

Engage

Students will open the weather app on a device and answer the questions below. Two to three students can look at the same device.

- Does the app tell you the air quality?
- What information can you find out about today's air quality?

- What scale is used for describing the air quality?
- Do you think weather apps should include air quality? Why or why not?

Explore

Materials:

- Each student gets a copy of the Air Quality Index Data Sheet
- Air Quality Index (AQI) Basics (printed or posted)

- Colored pencils that match the AQI colors as closely as possible.

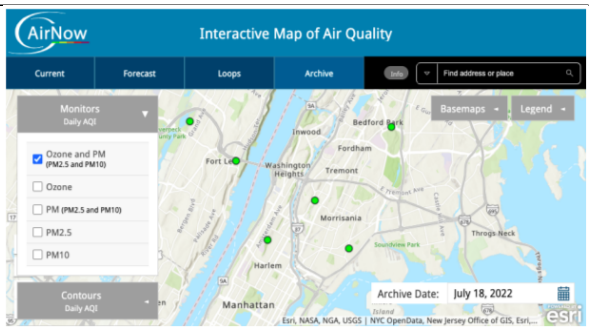


Air Quality Index Key

Credit: NASA (https://mynasadata.larc.nasa.gov/sites/default/files/inline-images/AQI%20Key.png)

1. Students read Air Quality Index (AQI) Basics (printed or on a device).
2. Cooperative Learning: On a sentence strip or piece of colorful paper, students work with their group to write a definition of AQI in their own words.
3. Each group shares their definition aloud with the whole class.
4. Teacher summarizes key ideas that came up multiple times as groups shared out.
5. Set-Up: Teacher projects the Air Quality Index Data Sheet and students have a paper copy in front of them.

    1. Teacher asks, “what do you notice about this chart?”



6. Teacher demonstrates how to use the AirNow Interactive Map, highlighting key features shown on the AirNow Interactive Map Tutorial.
7. Set-Up: (1 laptop per 2-3 students)

    1. Students follow the AirNow Interactive Map Tutorial to color in the Air Quality Index Data Sheet based on the archived AQI data from a monitor closest to their school.

Explain

Task: Create a AQI Update template for your school/region/town/city to inform residents about the air quality forecasted for today. Use the activity guides to help residents understand…

- What Ozone and PM AQI is forecasted for today
- Who needs to be concerned
- What certain groups of people should do to stay safe
- What actions schools should take to keep children safe given the air quality
- What residents can do to reduce ozone and particle pollution
- How today's forecasted AQI compares to the past five days (look back at the Air Quality Index Data Sheet that you colored in)
- Key facts about ozone and particle pollution
- Images and visually appealing slides that will keep viewers' attention as they look through the update

2. Students put a star underneath today's date.

Evaluate

Teachers will use the rubric below to evaluate students' updates.

Social Media Post Rubric			
4 - Exemplary	***3 - Proficient***	***2 - Apprentice***	***1 - Beginner***
I interpreted AQI maps and charts to create a social media post that would get a tremendous amount of attention on social media because it includes **clear and witty information** on today's forecasted AQI and is presented in a visually appealing way.	I interpreted AQI maps and charts to create a social media post that would captivate residents' interest and provide them with **accurate and thorough information** related to today's forecasted AQI.	I interpreted AQI maps and charts to create a social media post that would interest residents and provide them with **some information** related to today's forecasted AQI. Social media post may contain inaccuracies.	I **did not** interpret AQI maps and charts to create a social media post that would interest residents and provide them with accurate information related to today's forecasted AQI.

Answer Key:

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.

Sources:

1. *Activity Guides Publications*. (n.d.). AirNow.gov. Retrieved August 12, 2022, from https://www.airnow.gov/publications/activity-guides-publications/
2. *Air Quality Index - A Guide to Air Quality and Your Health. Brochure 2014. EPA-456/F-14-002*. (n.d.). AirNow.gov. Retrieved August 12, 2022, from https://www.airnow.gov/sites/default/files/2018-04/aqi_brochure_02_14_0…
3. *AQI Basics*. (n.d.). AirNow.gov. Retrieved August 12, 2022, from https://www.airnow.gov/aqi/aqi-basics/
4. Barrette, A. (2018, September 29). *6 Common Myths About Air Pollution and What You Can Do About Them*. Molekule Blog. Retrieved August 12, 2022, from https://molekule.science/common-myths-about-air-pollution/
5. *Home*. (n.d.). YouTube. Retrieved August 12, 2022, from https://gispub.epa.gov/airnow

NGSS Three Dimensional Learning

NGSS Disciplinary Core Ideas

- ESS3C: Human Impacts on Earth Systems

NGSS Crosscutting Concepts

- Cause and Effect

NGSS Science and Engineering Practices

- Analyzing and Interpreting Data
- Obtaining, Evaluating and Communicating Information

Supported Common Core ELA

- CC.11-12.R.ST.2

Learning Objectives

Interpret AQI maps and charts to communicate accurate information about air quality.

Essential Questions

- What can specific groups of people do to stay safe given the AQI in the region of our school?
- What actions should schools take to keep children safe given the AQI?
- How does today's AQI compare to the past five days?
- What can residents do to reduce ozone and particle pollution?

Teacher Background Information

Additional background information is available from the EPA in the Air Quality Index - A Guide to Air Quality and Your Health brochure.

Source:

U.S. EPA. (2014, February). *Air Quality Index: A Guide to Air Quality and Your Health*. U.S. EPA Office of Air Quality Planning and Standards Outreach and Information Division. Retrieved July 25, 2022, from https://www.airnow.gov/sites/default/files/2018-04/aqi_brochure_02_14_0...

Student Misconception

- Air pollution in China always exceeds that of the US
- Air pollution is present only if you can see it
- The air quality is always better indoors vs. outdoors
- The air quality of natural areas always exceeds that of cities

Source:

Barrette, A. (2018, September 29). *6 Common Myths About Air Pollution and What You Can Do About Them*. Molekule Blog. Retrieved July 22, 2022, from https://molekule.science/common-myths-about-air-pollution/

Student Resources

- Air Quality Index Data Sheet

- AirNow Interactive Map Tutorial

Teacher Resources

- AQI Update Rubric

Google Slide interactive Files

AQI Update Template