

# Analyzing Airplane Noise in New York City

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## Description:

Students will explore the relationship between aircraft traffic and noise pollution in New York City. Students will use an online program from the Federal Aviation Administration (FAA) to examine the different components of this relationship in real time, as well as historically. Students will analyze proposed airport noise mitigation measures and determine which ones they believe are most likely to be effective.

## Objectives:

- Observe aircraft flight paths and corresponding noise data on WebTrak in real time and historically
- Graph the noise levels versus number of operating flights to examine the relationship between aircraft traffic and noise, as well as the time of day
- Analyze proposed airport noise mitigation measures to determine which ones will best solve the airport noise pollution problem

## Vocabulary:

Noise, noise pollution

## Materials:

- Computers, laptops, or tablets with Internet access
- “WebTrak: Tracking our Air Traffic” worksheet
- Copies of the Recommendations section (pages 33-36) of the [2010 DEP Airport Study](#)
- Graph paper (optional)

## Background Information:

Since the advent of air travel, aircraft noise has been a significant source of noise pollution for communities located close to airports or underneath aircraft flight paths. This noise comes from aircraft engines. These noise disturbances contribute to a reduced quality of life experienced by city residents. Airport administrations have worked to minimize noise exposure of residents in the surrounding area. Some improvements include modifying engines, restricting take-off times, and altering flight paths. Despite these changes, communities adjacent to airports have continued to experience high levels of noise pollution caused by air traffic.

For more information, read the [2010 DEP Airport Study](#) on the impacts of aircraft noise on human health and safety (pages 31-32) and recommendations made for airport noise mitigation (pages 33-36).

Much of the noise pollution that we experience in New York City comes from airports and aircrafts. In this activity, students will get to use a program called WebTrak to examine in real time where and when aircrafts fly, as well as noise levels in different parts of New York City.

## Method:

- Discuss sources of noise pollution in NYC.
  - What are some of the loudest sources of noise pollution students can think of?
- Discuss the negative impacts of noise pollution from airports and aircraft. You may use [London’s Civil Aviation Authority 2016](#) report as a source.
- In pairs, have students start the [WebTrak](#) program.

- Give time for students to familiarize themselves and explore the features of the WebTrak program.
- Students will use WebTrak to complete the accompanying worksheet. Allow students 1-2 class periods to explore the platform and complete the worksheet.
- Come back together as a full class to discuss overall impressions of WebTrak as well as the worksheet. Be sure to talk about student ideas for airport and aircraft noise mitigation.
- Have students read the “Recommendations” section, found on pages 33-36 of the [2010 DEP Airport Study](#). Identify the 11 different recommendation measures and decide which measures you think would be most effective at reducing noise pollution from airports and aircraft. You can rank them as a class or in groups.
- Have students create a campaign to increase public awareness of aircraft-caused noise pollution.
- Have students identify the measure from the 2010 DEP report that they think will be most effective. Have them create a plan to enforce that measure.
- Have students vote on the 11 recommendation measures and create a class ranking of which measures should be implemented first. Encourage students to explain their reasoning behind each ranking.

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For more information visit [www.nyc.gov/dep](http://www.nyc.gov/dep)

## Discussion:

- What areas have the highest noise pollution from aircrafts?
- Why is it difficult to reduce aircraft noise in NYC?
- Why is there a delay in the time from the airplane passing overhead and the noise being recorded at the station?
- Were there any outliers in your data? What do you think caused these outliers?
- Looking at the 2010 DEP report, which measures do you think would be most effective at reducing airport and aircraft noise pollution? Why? Which do you think would be least effective and why?

## Extension:

- On [WebTrak](#), use the historical option towards the bottom of the left-hand panel to examine flight traffic and noise levels around a holiday. How do the noise levels and number of flights on/around holidays compare to today’s noise levels and number of flights?

Name: \_\_\_\_\_ Date: \_\_\_\_\_

## WebTrak: Tracking NYC's Air Traffic

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**Directions:** With a partner, log in to a computer, laptop, or tablet and navigate to [WebTrak](#). Answer the questions below.

### Quick Start Guide

1. Before clicking anywhere on the screen, take a moment to observe what is being displayed. What do you see? What surprises you? What question(s) do you have about the map and what it is displaying?

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2. Look at a clock in your classroom. What time is it? \_\_\_\_\_  
Look at the top right corner of the map. What time is it? \_\_\_\_\_

3. Why do you think there is a delay between the time it actually is and what WebTrak is showing you?

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4. How do you know if you are looking at an aircraft that is arriving or departing?

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5. Explore WebTrak by clicking through the Quick Start Guide and Legend tabs in the left-hand panel. Using the information found in these tabs, answer the following: What do the circles on the map represent? What do you think the changing numbers and colors of the circles mean?

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**Legend**

6. To find out more about the aircraft, look towards the top of the left-hand panel where it says, "Quick Start Guide." Above this, click on "Legend." How many different types of aircraft fly over New York City? List them here and see how many you can find on the map.

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7. You probably noticed that the aircraft on the map are different colors. What do these different colors mean?

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8. In question 5, you speculated what the changing colors and numbers of the circles on the map mean. Were you correct? What exactly do the numbers and colors show?

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### Flights

9. Click the box that says “Historical,” which can be found above the bar graph. Use the calendar button to select the date one week ago from today (i.e., if today is July 14, select July 7). Was the air traffic one week ago similar to the air traffic today so far? What did the rest of the day’s air traffic look like?

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10. Select a date that fell on a Saturday or Sunday. How is the air traffic on a weekend different from the air traffic on a weekday?

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Return to the graph you were viewing in question 9. Click on the smallest bar in the graph. Then click the “Set” button that is underneath the graph. Look at the map. How many circles are yellow, orange, or red? Record your findings in the columns of the table.

11. Fill out the table below. To find the number of aircraft, hover over the bars on the graph. To determine the number of yellow, orange, and red circles, click on the bar you want data for, then click the “Set” button to get the map for that time.

Hour #	Number of Aircraft	Number of yellow, orange, and red circles/squares	Hour #	Number of Aircraft	Number of yellow, orange, and red circles/squares
0			12		
1			13		
2			14		
3			15		
4			16		
5			17		
6			18		
7			19		
8			20		
9			21		
10			22		
11			23		

12. Look towards the bottom of the left-hand panel. Find the bar graph that shows today's flights by hour. Hover over each bar to see the hour and the number of flights (Hour 0 is midnight, Hour 1 is 1am, etc.).

As of now, which hour today has had the least number of flights? \_\_\_\_\_

The most flights? \_\_\_\_\_

13. What trends do you observe in this graph?

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14. How do you think the number of flights will change as the day goes on? Do you think they will increase, decrease, or stay the same, and why?

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15. On a separate sheet of graph paper, graph the relationship between the number of aircraft and the number of yellow, orange, and red circles/squares. What is the relationship between these variables? What time of day is the loudest and why do you think this is?

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### Flights for Thought

16. Click on "Show current flights" to get back to today's map. Choose an aircraft and observe its flight path. As it approaches and passes over noise monitoring locations (the circles), what happens to the noise levels?

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17. Click on the aircraft and jot down the following information:

- a) Flight ID \_\_\_\_\_
- b) Aircraft type \_\_\_\_\_
- c) Airports \_\_\_\_\_
- d) Altitude \_\_\_\_\_
- e) Speed \_\_\_\_\_
- f) Is the aircraft arriving or departing? (Use the Legend to help you.) \_\_\_\_\_
- g) Is the aircraft a commercial jet, a helicopter, or something else? (Use the Legend to help you.) \_\_\_\_\_

18. Why do you think there are typically fewer flights at night?

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19. Imagine a giant snowstorm hits New York. What do you think the map would look like (in terms of aircraft and noise levels) and why?

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20. How do you think WebTrak can be useful for people? How could it be made more useful?

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