Emissions

1. Read the paragraph below.

   According to the Environmental Protection Agency [EPA] (2017), air pollution is "created by human activities such as vehicle use, industrial operations, and agriculture practices, or by natural events such as wildfires" (EPA, 2021a). The Clean Air Act (CAA) of 1970, a federal law that "regulates air emissions from stationary and mobile sources" (EPA, 2021b) was passed with the aim of protecting people and the environment. Despite such regulations, neighborhoods are still impacted by toxic air emissions. Some are very high in some areas and much lower in other areas. Below is a table that shows the number of toxic air emissions released in each zip code in Cincinnati as reported in 2016 (Knight, 2018). While there are more zip codes that exist in Cincinnati, no other zip codes reported emissions (Knight, 2018).

2. The table below displays data on the amount, in pounds, of toxic air emissions in 2016 as well as the average household income in certain zip codes in Cincinnati. Create a graph from the data in columns "Toxic Air Emissions (in pounds)" and "Average Household Income."

Zip Codes	Toxic Air Emissions (in pounds)	Average Household Income (in U.S. dollars)
45225	3584	$ 15,035
45231	15	$ 54,107
45215	4506	$ 45,021
45217	1123	$ 43,152
45227	52345	$ 47,450
45229	912	$ 20,618
45233	303	$ 74,819
45204	13501	$ 25,377
45232	75281	$ 12,534
45209	1509	$ 52,428
45216	1312	$ 30,413
45237	4384	$ 32,299
45212	11635	$ 38,190

Source: The Cincinnati Enquirer and www.zipcodes.gov

3. *What is the mean amount of toxic air emissions across all of the zip codes?*

4. *Which zip code has the smallest amount of toxic air emissions? What is the average income in this zip code?*

5. *Which zip code has the largest amount of toxic air emissions? What is the average income in this zip code?*

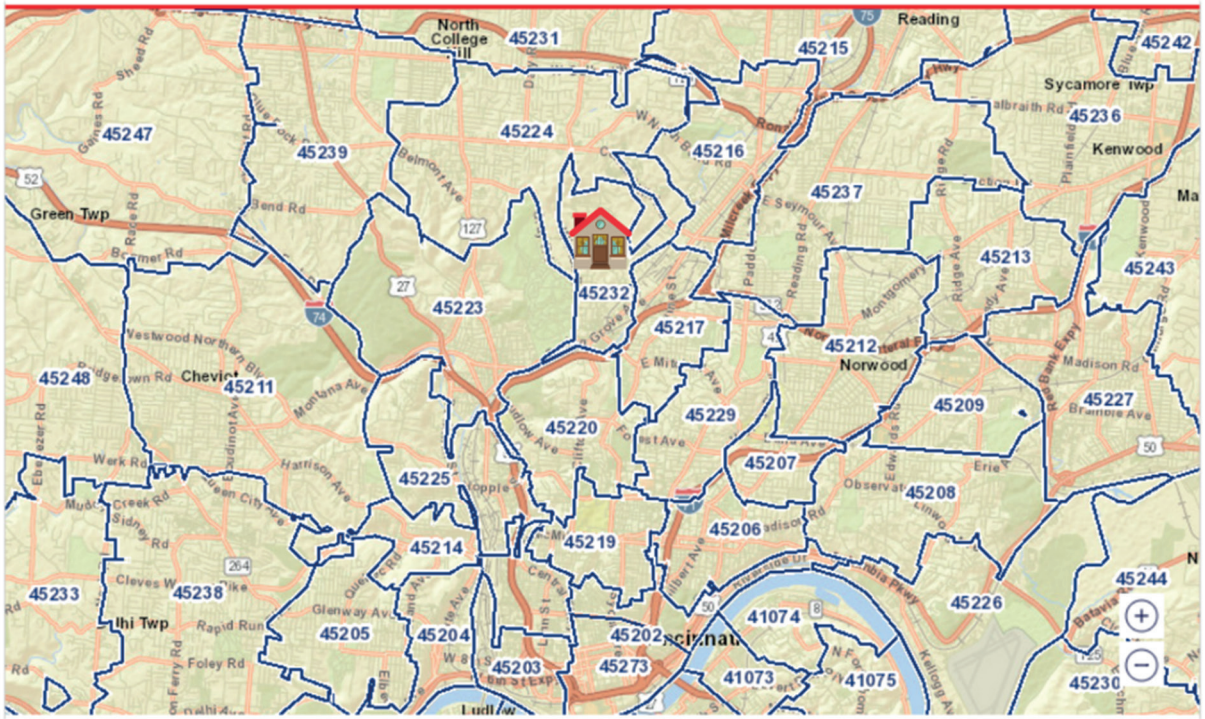
6. In the news clip, you saw people from the Winton Terrace Community, who live in zip code 45232, talk about how the air quality affects them. Take a look at the map below. Locate area code 45232, and some of the other zip codes included in your graph. Discuss the following questions with your partner.

   a. *What do you notice about how the surrounding zip codes differ in average household income as compared with Winton Terrace?*

   b. *What do you notice about how the surrounding zip codes differ in the number of pounds of toxic air emissions pumped into the environment as compared with Winton Terrace?*

   c. *Why do you think some zip codes have higher toxic air emissions than others?*

   d. *Is this fair? Should something be done about it? If so, what?*



Source: Map Data from the United States Postal Service.

7. Share your graph with your partner. Compare how your graphs are similar, and how they are different. Address the following questions and prompts about the data:

   - *Why might a graph be a better display of the data than a table?*
   - *Which was your independent variable and which was your dependent variable and why?*
   - *Why did you choose the graph you chose to display the data?*
   - *Is one graph more convincing than the other? Why or why not?*
   - *Which graph shows the most accurate display of the data and why?*
   - *What is the meaning of "accurate" in this context?*

8. Use the website www.airnow.gov/ to determine the current air quality rating in your zip code?. What could you do to advocate for better air quality in your community or the community of others?