

## Exploring Air Quality

### Student Activity Sheet 1

#### Warming Up with the Data

No matter what kind of data you work with, take a moment to investigate the data's source before diving into exploration and analysis. Consider these questions:

- **Why were the data collected?**
- **Where were the data collected?**
- **When were the data collected?**
- **How were the data collected?**

Answering these questions gives you a sense of what we call the **scope** of the data. Typically, the data do not contain complete information (the scope is restricted in some way), yet we want to use the data to accurately describe air quality as well as we can. Understanding the scope can provide valuable insights about how to analyze your data, as well as help you decide how much trust you can place in your findings and how far you can generalize your findings.

You have already answered the first question in the Exploring Air Quality module *Overview*. The remaining three questions will uncover some complexities with the data. Taking time now, before your first exploration and analysis, can help you better understand the data and come up with your approach for analysis.

1. *Where?* The data are collected at many locations around the world. Each sensor has its location on the globe. This kind of data is called **geo-spatial**.

a. How would you look for relationships and patterns with geospatial data?

b. Why might it matter to know the location of the sensors?



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2. *When?* The data are also collected over time. We can look at measurements for one hour, one day, or even one whole year. This kind of data is called **temporal**.
- a. How would you look for relationships and patterns with temporal data?
  
  
  
  
  
  
  
  
  
  
  - b. Why might it matter to know the date and time when the PM 2.5 is measured?
3. *How?* The data are collected by PurpleAir sensors. If we place a sensor in a controlled environment, we don't expect to get the same readings for particulate matter every time. These measurements would still show some **variation**, due to the instrument's accuracy.
- a. How would you assess the accuracy of the instrument?
  
  
  
  
  
  
  
  
  
  
  - b. Why might it matter to know the accuracy of the sensors?



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In addition to the scope of the data, we also want to consider **granularity**, or how finely grained the measurements are. PurpleAir measurements are taken every 5 seconds and then averaged to different levels of granularity.

4. From the map, you have a few choices, such as None (really 2-minutes), and 30, 60, and 1440 minutes.

a. Why might you be interested in each of these options?

b. Can you create a different granularity yourself? How?

