**Air Quality Assessment**

**Introductory Activity: Air Pollution Sources in Indianapolis / Weather and the Air Quality Index**

**Field Activity: Tools Explanation / Global Air Quality Predictions, Outdoor Field Study**

**Description:** Students assess local air quality by monitoring their surrounding environment for the presence, absence and/or concentration levels of the six primary air pollutants including: ozone, particulate matter, sulfur dioxide, nitrogen dioxide, carbon monoxide, and lead. Students collect weather data and monitor for pollutants utilizing a variety of measurement tools including: Vernier LabQuest scientific handhelds, relative humidity sensors, temperature sensors, anemometers, handheld gas detectors, ozone indicator strips, particulate matter collectors, and lead detection swabs. Collected data is analyzed against the Air Quality Index and conclusions are drawn about the local air quality.

**Objectives:** By the end of the program, the students will be able to:
- Define air quality, air pollution, pollutant, anthropogenic, and air quality index (AQI)
- Name the six principle pollutants (O₃, PM, CO, SO₂, NO₂, and lead)
- Identify the main anthropogenic sources of the six principle pollutants
- Interpret an air quality index (AQI) and construct a graph using given variables
- Explain what affect weather conditions (i.e. humidity, temperature, precipitation, and wind speed) have on local air quality index levels
- Consider both anthropogenic and natural factors in predicting local air quality for given regions around the world
- Use scientific investigation tools and observation skills to collect local air quality data and draw conclusions
- Explain how human activities can influence air quality both positively and negatively

**2010 Indiana Academic Standards for Science:**

**Fourth:** 4.2.6

**Fifth:**

**Sixth:** 6-8.RS.3, 6-8.RS.4, 6-8.WS.4

**Seventh:** 6-8.RS.3, 6-8.RS.4, 6-8.WS.4

**Eighth:** 8.2.6, 6-8.RS.3, 6-8.RS.4, 6-8.WS.4

**High School:** ES3.2, 9-10.RS.3, 9-10.RS.4, 9-10.WS.4, 11-12.RS.3, 11-12.RS.4, 11-12.WS.4

**2000 Indiana Academic Standards for Mathematics:**

**Fourth:** 4.1.1, 4.1.9, 4.2.1, 4.2.12, 4.3.8, 4.6.1, 4.6.2, 4.7.1, 4.7.2, 4.7.3, 4.7.4, 4.7.5, 4.7.6, 4.7.8, 4.7.9, 4.7.10

**Fifth:** 5.1.2, 5.1.4, 5.3.4, 5.3.7, 5.5.6, 5.6.1, 5.7.1, 5.7.2, 5.7.3, 5.7.4, 5.7.5, 5.7.7, 5.7.8, 5.7.9

**Sixth:** 6.1.1, 6.3.9, 6.5.1, 6.5.6, 6.5.9, 6.6.5, 6.7.1, 6.7.3, 6.7.4, 6.7.5, 6.7.6, 6.7.9, 6.7.10, 6.7.11

**Seventh:** 7.5.1, 7.6.1, 7.6.2, 7.7.1, 7.7.3, 7.7.4, 7.7.5, 7.7.6, 7.7.7, 7.7.10, 7.7.11, 7.7.12

**Eighth:** 8.5.1, 8.6.2, 8.7.1, 8.7.3, 8.7.4, 8.7.5, 8.7.6, 8.7.7, 8.7.10, 8.7.11, 8.7.12

**Excellence in Environmental Education-Guidelines for Learning (Pre K-12):**

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Please note specific learning objectives and academic standards will vary based on timeframe, location, availability of resources, and tailored content of programming.