



## Y-CITYSCI: A Youth-Led Citizen Science Network for Community Environmental Assessment

Environmental Assessment Curriculum: Lesson 10

Grade Level: Middle school

Duration: 1 hour

### Research Project Planning

#### Next Generation Science Standards

Disciplinary Core Ideas:

ESS3.C: Human impacts on Earth systems

Science and Engineering Practices:

1. Asking Questions and Defining Problems
- 3: Planning and Carrying Out Investigations

#### Objectives

1. Students will discuss the scientific process.
2. Students will organize their research project plans.

#### Materials

- Smartboard/projector
- [“The Scientific Method”](#) video
- “Research Project Planning” sheet (1 per student)
- Laptop/tablet (1 per group)
- Final Research Poster Template

#### Activities

**Bellringer:** Watch the [“The Scientific Method”](#) video. Discuss the scientific process and the general steps it includes (observation, research, hypothesis, experiment, conclusion, share results). Be sure to explain that the process does not always include these steps exactly. (5 mins)

**Lecture:** Explain to students that they will be planning a research project today, and they will work on this project for the remainder of the program. They will take what they have learned throughout the semester and apply by conducting a research project at their school. Show students the template for their final research project poster so that





they know what they are working towards. Let students know that they will choose a research question that relates to one of the types of pollution that we covered in previous sessions (soil, air, noise or pollution, or the built environment). Review all four topics and the methods and tools the students used to explore these issues. What problems do these pollutants cause for our communities? What are possible solutions to these problems?

Pass out the “Research Project Planning” sheet and review how the steps align with the scientific method they have learned. The steps of the scientific process can vary depending on the specific needs of a project. (10 minutes)

**Activity:** Put students into their project groups and give each group a laptop. Have students complete the first four rows of their planning document, giving them about seven minutes to decide on each item. As each group decides on a topic, question, etc., they should raise their hand and get your approval before moving on to the next item. Students may use the laptop to research possibilities as they begin to plan their project.

Be sure to let students know what tools they will be able to use to collect data for their projects. Are all tools that were used in previous sessions available? Are their funds available to buy additional instruments? (30 minutes)

**Discussion:** Have each group share what they planned for their research project with the class. Give students a chance to ask each other questions and give feedback. Remind students that the planning documents may change over time and should be used as an organization tool to take notes on and adjust as they receive feedback and conduct research.

**\*Be sure to collect planning sheets and bring any tools or instruments the students will need to the next session. (15 minutes)**



Name(s): \_\_\_\_\_

### Research Project Planning Document

Use the table below to organize and plan out your research project. Choose one of the following topics to focus on: air pollution, soil pollution, or noise pollution.

Example:

<b>Topic</b>	<i>Water pollution</i>
<b>Question or Problem</b>	<i>Is it safe to drink the water from our school water fountains?</i>
<b>Hypothesis</b>	<i>All water fountains in the school will have unsafe levels of bacteria in their drinking water.</i>
<b>Method/Tool</b>	<i>Take samples from all 10 school water fountains and use a drinking water test kit to test water quality.</i>

<b>Topic</b>	
<b>Question or Problem</b>	
<b>Hypothesis (if applicable)</b>	
<b>Method/Tool</b>	

To be filled out later in the research process:

<b>Data Collection</b>	
<b>Data Analysis/Conclusion</b>	
<b>Data Sharing</b>	
<b>Presentation</b>	

