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### **One neighborhood, one science problem, many solutions!**

**Course purpose:** In this Authentic Research Module, a full course, students will be introduced to the general process of scientific research by utilizing their neighborhood as a science resource. They will also begin to think critically about living in their neighborhood and city. The course will expose students to elements of both quantitative and qualitative research methodology but will focus on the latter, help improve their writing skills, and encourage them to enter science research competitions.

**Course description:** Neighborhoods are full of people and places that are important to our everyday lives. Importantly, they are places where science happens. Science does not only happen in laboratories. We can use our neighborhoods to inspire our research or they can be the sites where we can conduct our studies. Scientific problems can be either about the physical or social worlds: Would planting more trees in your community absorb the same amount of carbon dioxide that local car traffic produces? Do you think your neighborhood's many fast food restaurants are contributing to a rise in the health problems of its residents?

This is an interdisciplinary module that integrates aspects of environmental psychology, architecture, urban geography, and qualitative methodology in order to help students generate a research study in the public health or environmental science fields.

This course aims to diversify high school students' scientific inquiry experiences by 1) exposing students to qualitative research methodology and 2) integrating writing intensive pedagogy, both of which are not usually made accessible to them. Additionally, it is designed to support students' participation in scientific competitions, such as [Wise Quality of Life](#), [NYCSEF](#), or the [Dupont Challenge](#).

**Next Generation Science Standards Met in *One neighborhood, one science problem, many solutions!***

#### **Science and Engineering Practices**

- Asking Questions and Defining Problems
- Obtaining, Evaluating, and Communication Information
- Engaging in Argument from Evidence
- Constructing Explanations and Designing Solutions
- Analyzing and Interpreting Data

#### **Crosscutting Concepts**

- Patterns

#### **Disciplinary Core Ideas**

- HS-ETS1: Engineering Design
- HS-ETS 2: Links among engineering, technology, science, and society

**Essential questions:**

- What type of science problems exist in our communities?
- How can we use our neighborhood as a resource to design research studies that address these problems?
- What is the general process that scientists undergo when they conduct research?
- How can qualitative methodology be utilized in the sciences?

**Enduring understandings:**

- Neighborhoods are local places for people to conduct research about diverse physical problems, such as ones that concern environmental science and social problems, including public health.
- In our neighborhoods, we can use the qualitative methods of field observations and in-depth interviewing to conduct a study or as background research to inspire a study.
- All types of science researchers must follow the same basic guidelines – from the generation of an idea to the communication of research results – in order to conduct a research study.
- Some qualitative methods, normally reserved for the social sciences, can be used to support the critical thinking process involved in learning the foundations of scientific research.

**Units of course**

1. What is scientific research?
  - a. General process
  - b. Differences between quantitative and qualitative research
2. Qualitative method 1: Field observations
  - a. Neighborhood Walk
3. Research question development
4. Qualitative method 2: In-depth interviewing
  - a. Portfolio of 1) research question, 2) original interview questions, 3) follow-up/ revised interview questions, 4) coded transcript, 5) preliminary findings report