# Citizen Science in the Classroom

## Meet Victoria Houser!

Victoria Houser

Forest Service Recreation Staff Officer

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   "*I have worked to develop citizen science projects with high school groups in Alaska and Colorado. These students have worked hard to demonstrate the value of citizen-based research and stewardship.*"

Follow the Spotlight Bee through this section to get more advice from Victoria Houser.

*Photo courtesy of Victoria Houser.*

## How To Create a Successful Program

### Step 1: Scope Out Your Problem

   Start by brainstorming potential topics or problems with your students. Create a list of your students' areas of interest. As you think about potential topics, ask the class: Why does the topic matter? What research has been done in the past? What are the goals of this research?

   Based on your discussions with the class, narrow the list of topics to five or less and look for citizen science projects associated with the areas of interest. A list of resources is available in the "Citizen Science Resources" on page 89 of this journal. Locate other citizen science projects by searching the Internet. Compare and contrast the potential projects by examining each project's requirements for time, location, topic, equipment, costs, or skills. Choose the project that best fits your requirements and those of your students and your community.

   Work with your students and school community to identify any barriers to completing the chosen citizen science project. How much does the project cost? How much time does the project require? Is safety an issue? Identify ways to overcome these potential barriers. Safety should always be a primary concern.

"The possibilities for citizen science projects are endless. Narrow down the choices by knowing your limitations, discussing the interests of students, and conducting research on your location.

Contacting local stakeholders, such as a State natural resource agency, Federal natural resource agency, or natural resource nonprofit organization, is another good way of narrowing down the topic. Agencies and organizations can provide expertise and can potentially help complete the project."

## Step 2: Design a Project

Once you have identified the citizen science project, work with your students to create goals and objectives. Goals are broad statements that highlight the potential positive outcomes of the project, such as: "A goal for this project is to improve school community awareness of a stream located in the schoolyard." Objectives are more specific, measurable, and, in many cases, relate to student learning. An example of an objective is: "Students will be able to explain the steps of the scientific method."

Work together with your students to create an inventory of the resources available to complete the project. What resources can the school provide? What resources are available from the local stakeholders or the people running the citizen science project?

Develop a plan for how the citizen science project should proceed. Include items such as timelines, participant roles (maybe provide a few examples of types of roles), scientific protocol, and how the results of the project will be used.
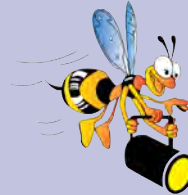
"Any time you go outside and observe the natural world, you are practicing citizen science. The next steps are recording the observations and making a plan to use the results of the observations. Create or use an existing protocol that is manageable for the student age level, replicable, and produces meaningful data. This component probably takes the most work. If you are contributing to an established citizen science project, the organization will provide the protocol. If you and your students create your own project, students should test the protocol before starting data collection.

Methodology should include an explanation of how the results will be used. Questions to think about include: What information is needed to answer our questions? How will we share our information with others?"

## Step 3: Build a Community

Engage the students, stakeholders, and other community members in the project. Use the strengths of all participants, and make sure that each participant or group of participants knows their role. What resources do your students or stakeholders need?
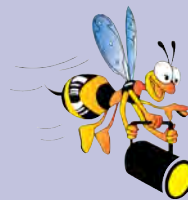
"Remember that unexpected results, or unsupported hypotheses, are important too. Catching no fish in a river tells us something!"

## Step 4: Manage Your Data

Just like scientists, your students are collecting data to help answer a research question. If it is your own citizen science project, be prepared with a plan to handle and store your data. If you are contributing to an established citizen science project, the organization will have programs that help compile your data for you and provide access to it.

Work with your students to analyze the data. Analysis helps document and describe facts, detect patterns, develop explanations, test hypotheses, and check for error.
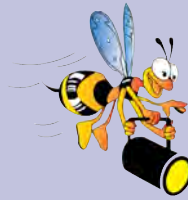
**Victoria Houser says....**

"Get "buy-in" from your students and other participants by allowing them to be leaders or decisionmakers in the project. Give them an opportunity to present their work and participants will be empowered by the real-life impacts of this work."

## Step 5: Sustain and Improve

Successful projects require sustained participation and funding. Adapt to changes in participation, look for new resources, and evaluate your project continually. Consider making a newsletter or blog to update people on the progress of your project.

**Victoria Houser says....**

"Sharing results with others helps grow support for your project. Support from new participants, whether they are students or agencies, can contribute something toward the continuation of the project."

Adapted from the Federal Citizen Science and Crowdsourcing Toolkit: https://crowdsourcing-toolkit.sites.usa.gov/.