Invasive Crayfish Collaborative
Great Lakes

Lesson 9

Community Presentations + Engagement

Subjects Science, Language Arts

Grade Levels Ideal for grades 6–12, adaptable for 2–5

Time Will vary

Lesson Overview

Students learn about effective science communication strategies and make presentations and/or create videos about their crayfish research project(s). In this way, students strengthen their understanding and skills and magnify their impact in the community.

A student presents about her research project.
Photo: U.S. Dept. of Agriculture

Goals

- Students will create presentations and/or videos that engage the community.
- Students will increase their skills of organizing information, presenting it to others, and working collaboratively as teams.

Objectives

- Students will create effective presentations and/or videos that educate the community about their work to investigate native and invasive crayfish and their ecosystems in your area.
- Students will effectively present their work to peers and the broader community with the assistance of multimedia technology.

Next Generation Science Standards

Performance Expectations

Building Toward

- MS-ETS1-1: Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions.
- HS-ETS1-1: Analyze a major global challenge to specify qualitative and quantitative criteria and constraints for solutions that account for societal needs and wants.
- HS-ETS1-3: Evaluate a solution to a complex real-world problem based on prioritized criteria and trade-offs that account for a range of constraints, including cost, safety, reliability, and aesthetics as well as possible social, cultural, and environmental impacts.

Crosscutting Concepts

- Stability and Change
- Structure and Function
- Systems and System Models

Science & Engineering Practices

- Constructing Explanations (for science) and Designing Solutions (for engineering)
- Engaging in Argument from Evidence
- Obtaining, Evaluating, and Communicating Information

Core and Component Ideas in the Life Sciences

LS1: From Molecules to Organisms: Structures and processes

- LS1.B: Growth and Development of Organisms

Core and Component Ideas in Earth and Space Sciences

ESS2: Earth's Systems

- ESS3.C: Human Impacts on Earth Systems

Common Core State Standards

Speaking and Listening Standards for Grade 6

(similar standards for grades 4–5; 7–12)

Standard 4. Present claims and findings, sequencing ideas logically and using pertinent descriptions, facts, and details to accentuate main ideas or themes; use appropriate eye contact, adequate volume, and clear pronunciation.

Standard 6. Adapt speech to a variety of contexts and tasks, demonstrating command of formal English when indicated or appropriate.

College and Career Readiness Anchor Standards for Writing

Standard 6. Use technology, including the Internet, to produce and publish writing to interact and collaborate with others.

Standard 7. Conduct short as well as more sustained research projects based on focused questions, demonstrating understanding of the subject under investigation.

Center for Great Lakes Literacy Principles

Principle 6. The Great Lakes and humans in their watersheds are inextricably interconnected.

Principle 8. The Great Lakes are socially, economically, and environmentally significant to the region, the nation and the planet.

Teacher Background

This lesson provides guidance on conducting presentations and effectively communicating science to the public. Presenting their accomplishments strengthens students' understanding and skills and magnifies their impact in the community. Audiences could include city or town leaders, parents, the rest of the school including administration, and/or another school, as well as restoration partners, landowners, and the community at large. The exercise helps students further reflect on what they have learned throughout their study of crayfish and freshwater ecosystems, understand that their work is important to the public, further educate others on what they have learned, and develop their public speaking and presentation skills.

Materials

- Computer access and software such as PowerPoint, Google Slides, Keynote, Prezi, and/or iMovie to create multimedia presentations and/or videos
- Display screen
- Copies of the "Presentation Rubric" at the end of the lesson, one for each student
- *Optional:* Tables for students or partner organizations to display information

Preparation

1. Schedule an event well in advance and, if desired, work with partners to invite community members such as funders, parents, and administrators, as well as partner organizations, such as governmental agencies and nonprofit organizations interested in crayfish (e.g. Invasive Crayfish Collaborative), freshwater ecosystems, and/or water quality.
2. Encourage students to dress appropriately when it is time to present to the public.
3. Consider encouraging students to incorporate props into their presentations which will better engage the audience and help convey their points.
4. Make copies of the Presentation Rubric, one for each student.

Teaching Suggestions in the 5E Model

Engage + Explore

1. Start by asking students why they think it's important for the public to understand science. Discuss the potential consequences when people lack access to accurate scientific information. Talk as a group and then brainstorm different ways science can be shared with the community.
    - Provide students with examples of science communication formats, such as infographics, posters, street murals, and social media posts. Resources can be found in the Expand Knowledge + Skills section.
2. Tell students that your class will be planning a community event where they will have the chance to present their own data and work. Students will decide as a class what the event will look like, who should be invited, and how they will present their work.

3. Talk with students about ideas for the format of the community presentations and/or videos. This will give them the opportunity to incorporate their ideas for the event(s) and have more "buy-in" and enthusiasm for it.
4. Have students discuss their ideas in small groups before sharing them out in a whole class discussion.

Explain

5. Depending on what you decide as a class, explain to students what will be expected of them. For example, tell them that they will be working with small groups to create 5–10-minute-long oral presentations or videos about their project. Engaging multimedia content should be incorporated using software such as PowerPoint, Google Sheets, Keynote, or Prezi, or videos can be created using software such as iMovie. Encourage students to conduct additional research to enhance their presentations/videos and bolster their arguments.
6. Discuss or provide students with a sample outline they can use to help them structure their presentations and videos. For example, instruct students to include details such as:
    - All the elements of the Crayfish Study, including visuals (see lesson 5)
    - The native and invasive crayfish species found in their state
    - The anatomy, life cycle, and importance of crayfish
    - What they learned during their field work and/or classroom activities
    - How their field work enhanced what they learned in the classroom
    - How they changed because of this project

    Details such as these are especially important if community partners, funders, and/or school administrators will be in the audience.
7. Pass out copies of the "Presentation Rubric" at the end of the lesson (or your own rubric) to guide student learning and let them know how they will be assessed. Tell students that they will complete the "Self-Score" portion of the rubric and turn it in to you before they present.
8. If desired, work with partner organizations to develop an agenda for the community presentations. Consider inviting other organizations to attend who can staff tables and offer volunteer opportunities after the presentations are complete.
9. Offer students the opportunity to practice their presentations beforehand. A "dress rehearsal" in the space where students will be presenting publicly is helpful.
10. On the day of the event, sit back and watch students shine!

Enrich/Extend

- Collaborate with grade level English/Language Arts teachers to support standards that have been taught in the students' English classes. Students could do a joint project in which they work on science and literacy together in both their English and science classes.
- Students can present to younger students to teach them about their work.
- Present one or more awards to outstanding class members, either individuals or groups. Awards could be for exceptional additional volunteer efforts, the most outstanding restoration plan, etc.

- Identify students who have photography and/or film experience and ask them to use a camera(s) and/or video camera(s) to document the community presentations. Students can then share their presentations via YouTube, the school website, social media, etc., as allowed by school and district policy.

Evaluate

- Evaluate group presentations/projects using the rubric.
- Record levels of oral participation and group participation throughout the project.
- Ask students and community members to provide feedback about your event so it can be used to improve future events.

Expand Knowledge + Skills

- Invite professionals to serve as keynote speakers for community presentation events. This can help enhance everyone's understanding of freshwater ecosystems.
- Encourage students in the audience to ask questions after each presentation. Questions can be answered by presenting students, as well as professionals.

Science Communication and Presentation Skills

- "10 Forms of SciComm for Everyone" by Aimen Arshad: fancycomma.com/2023/02/11/10-forms-of-scicomm-for-everyone/
- McGivern, H. "An Introduction to Science Communication: Translating Your Research for a Non-Specialist Audience", Oxford University Hospitals:bodleian.ox.ac.uk/sites/default/files/bodreader/documents/media/iskills-introduction-science-communication.pdf
- "Science Murals, Communicating and Visualizing Science via Public Art", Art + Bio Collaborative: artbiocollaborative.com/sciencemurals
- "How She Teaches Presentation Skills" by How She Teaches: howsheteaches.com/2023/02/27/how-she-teaches-presentation-skills/

Education Standards

- More information about the Next Generation Science Standards, to which this lesson was aligned: nextgenscience.org
- More information about the Common Core State Standards and links to the complete documents: thecorestandards.org

Name: _____ Period: _____ Date: _____

Presentation Rubric

Name of Organism: _____

Presentation Component	**Maximum Points Possible**	**Self-Score** (fill out before presentation)	**Teacher Score**
Content			
Subject and purpose of presentation clearly introduced	10		
Key concepts identified and clearly explained in well-organized way	10		
Ideas supported by examples, data, graphs, etc.; All information accurate and obtained from reliable sources	10		
Conclusion summarizes key points in persuasive way; Questions answered thoroughly and accurately	10		
Delivery/Audience Engagement			
Speech delivered clearly at appropriate volume and speed (not too fast, slow, loud, or soft)	10		
Speed, volume, and voice inflection are varied to engage audience and emphasize key points	10		
Speaker connects with audience through eye contact and does not spend too much time looking at notes or screen	10		
Speaker demonstrates enthusiasm for topic throughout presentation; audience is persuaded by speaker about important role(s) in ecosystem	10		
Visual(s)			
Visuals help to clearly explain concepts	10		
Writing Conventions			
Grammatical and spelling conventions followed	10		
TOTAL:	**100**		

Teacher Comments: