



ELEMENT 6

RECOMMENDATION AND PRESENTATION BUILDING

Student Driving Question: How can my investigation help people peacefully coexist with carnivores?

SUMMARY

Who: Teacher-facilitated

When: Early to mid-May (for exact date, see Calendar 2019-2020 on page 5)

Time: 2 or more periods

Where: Classroom

DESCRIPTION

Students develop their recommendation for how their community can peacefully coexist with carnivores, using the Claim Evidence-Reasoning (CER) framework of a scientific explanation. The Evidence and Reasoning portions are based on students' investigations. Their presentation is built around their recommendation and can take the form of a slideshow or a tri-fold board.

OBJECTIVES

By the end of this element, students will be able to...

- Develop an explanation for their findings about the relationship between carnivores and a resource of interest from the data they collected.
- Discuss the limitations of their data collection and analysis, including confounding factors.

CONNECTIONS TO NGSS

See the Facilitator Notes in the activity description of the lesson and guide at the beginning of this document for more details. Descriptions in the Facilitator Notes are from the Appendices (NGSS Lead States, 2013).

Science and Engineering Practices

- Ask Questions and Define Problems
- Construct Explanations and Design Solutions (x4)

Crosscutting Concepts

- Stability and Change

Disciplinary Core Ideas

- LS2.A: Interdependent relationship in ecosystems
- LS2.C: Ecosystem dynamics, functioning, and resilience
- ESS3.C: Human impacts on Earth systems

MATERIALS AND PREPARATION

Part 1: Recommendation Building

- ☐ Distribute Student Packet sheets (E7: Recommendation Building)

Part 2: Presentation Building

- ☐ Distribute Student Packet sheets (E7: Presentation Building)
- ☐ Arrange for computer access (if preparing projects on computers)
- ☐ Order poster boards from zoo (if students are preparing trifold poster boards)
- ☐ Obtain pens, colored pencils, and art supplies as needed for student projects
- ☐ Determine the format of Communication Tools (see Table 8 on page 42)

ACTIVITIES

PART 1: RECOMMENDATION BUILDING

It may be helpful for students to work in small groups to create their recommendations.

1. Introduce the activity and revisit students' motivations (5 minutes)

Frame the introduction to this element as taking a step back to look at the broader context of research and investigations. Up until this point, students have been focused on looking at a specific investigative question. Now, they will be developing a scientific explanation that puts their results into the context of solving problems in society.

Ask students to review and share what they wrote for their motivation of asking their investigative question in their **Student Packets from Element 3**. This can help set the stage for making connections between their investigation and the recommendation.

If students are unfamiliar with the Claim-Evidence-Reasoning (CER) framework for creating a scientific explanation, you may want to spend a time reviewing each part and/or provide examples of CER explanations.



Scientific and Engineering Practices

Constructing Explanations: “Construct a scientific explanation based on valid and reliable evidence obtained from sources (including students’ own experiments).”

Constructing Explanations: “Apply scientific ideas ... and/or evidence to construct, revise ... an explanation for real-world phenomena.”

2. Students develop a Claim (10 minutes)

Ask students to recall the driving question of the unit (“How can humans peacefully coexist with carnivores—meet our needs while allowing carnivores to also meet their needs?”).

Explain to students that a claim is a statement that answers the investigative question—in this case, the driving question of the unit. It is usually one sentence in length, and does not include any reasoning, evidence, or words like “because.” A framework for the claim can be:

In order to peacefully coexist with carnivores, we recommend that people _____.

Examples of recommendation claims are below:

- ...be aware of carnivores if you live in an older neighborhood.
- ...watch out for carnivores while driving at night.
- ...hike in groups.

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Students write a Claim in their **Student Packet**.



Disciplinary Core Ideas

ESS3.C. Human Impact on Earth systems. *“...Activities and technologies can be engineered to reduce people’s impacts on Earth.”*

Changing our behavior or attitudes that impact local carnivores and wildlife is a part of the zoo’s mission to “make conservation a priority in everyone’s lives.”



3. Students support their Claim with Evidence (10 minutes).

Explain to students that the evidence for their claim should be based on their investigation results. It can be the major finding of their investigation or a summary of their results graph. Their evidence can begin with a sentence such as:

“When we [used this(ese) method(s)], we found [this major finding].”

The following is evidence from a student project: “When we asked how often people were seeing carnivores in their neighborhoods, we found out that carnivores are sighted more often in older neighborhoods than younger neighborhoods. Neighborhoods that are 21+ years old report being regularly seeing 35% of commonly seeing carnivores. By regularly we mean daily, weekly, or monthly. Only 19% of people living in newer homes (0-5 years) report seeing carnivores regularly.”

Students work in small groups to write their evidence to support their claim in their **Student Packet**.



Disciplinary Core Ideas

Constructing Explanations: *“Construct an explanation that includes qualitative or quantitative relationships between variables that ... describes phenomena.”*



Crosscutting Concepts

Stability and Change: *“Explanations of stability and change in natural ... systems can be constructed by examining changes over time...”*



4. Students connect their Claim and Evidence with Reasoning (15 minutes)

Reasoning explains “why and how” their evidence supports their claim. It includes an explanation of the underlying science concept that produced the evidence or data. Student reasoning may be based on information they gathered at the zoo, during the Western Wildlife Outreach visit, or their knowledge of ecosystems and how carnivores impact ecosystems.

Reasoning for the example above may be the following: “Older neighborhoods have larger trees and more shrubs and other plants that the carnivores’ prey like to eat. Therefore, people in older neighborhoods can expect to encounter more carnivores because the environment is like their native ecosystem.”

Students record their reasoning in their **Student Packet**.



Scientific and Engineering Practices

Constructing Explanations: “Apply scientific reasoning to show why the data or evidence is adequate for the explanation or conclusion.”

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Disciplinary Core Ideas

LS2.A: Interdependent relationship in ecosystems: “Organisms and populations are dependent on their environmental interactions with both other living things and non-living factors, any of which can limit their growth...”

LS2.C: Ecosystem dynamics, functioning, and resilience: “Ecosystem characteristics vary over time. Disruptions to any part of an ecosystem can lead to shifts in all of its populations...”

ESS3.C: Human impacts on Earth systems: “Human activities have altered the biosphere, sometimes damaging it, although changes to environments can have different impacts for different things...”

Reasoning can emphasize interdependent relationships in ecosystems and/or human impacts related to the DCIs.

5. Students review each other’s recommendations and give feedback (10 minutes)

If time allows, ask students to exchange packets to read each other’s recommendations and/or read them aloud to the class for feedback.

- Do you think the reasoning connects the evidence to the claim?
- Do you think that is the best explanation?



Scientific and Engineering Practices

Asking Questions: “Ask questions to clarify and/or refine ... an explanation.”

Constructing Explanations: “Construct ... an oral and written argument supported by empirical evidence and scientific reasoning to support ... an explanation.”

PART 2. PRESENTATION BUILDING

Presentation building has been simplified through the Student Packet, which clearly identifies the components that will be included in the presentation.

6. Introduce the task of giving a presentation (5 minutes)

If you haven’t already, tell students that zoo staff will be coming to the classroom to view their presentation. You can tell students that it is our favorite part of the unit because we get to see all the hard work they’ve been putting into their projects.

Hand out the Student Checklist. Feel free to add any of your own expectations for good presentations, such as good slide design.

7. Students develop their Communication Tool and presentation (45 minutes or more)

Students complete their communication tools (possible formats in Table 8 on page 42 and practice giving their presentations prior to Element 7. The communication tool will be prepared by students and used to accompany a five minute presentation about their investigation. The most popular formats are digital slides or tri-fold boards.

Encourage students to review their work using the Student Checklist and make revisions to their Communication Tool and presentation as needed.



Scientific and Engineering Practices

Constructing Explanations: “Construct ... an oral and written argument supported by empirical evidence and scientific reasoning to support ... an explanation.”

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Table 8. Various communication tools that students can use to present their recommendation and investigation results. Students must also prepare a five-minute presentation in addition to their Communication Tool.

Format	Description
Presentation Slides	• Create slides using PowerPoint or Google Slides. Students may also use Prezi, a free interactive online presentation tool (https://prezi.com/).
Tri-fold poster	• Use a tri-fold poster to display the recommendation and project elements.
Public Service Announcement (PSA)	• A PSA is designed to reach a specific group with a message that will change their behavior. • For a PSA lesson plan, including a template and rubric, visit: http://www.scholastic.com/browse/lessonplan.jsp?id=1504
Infographic	• Students create an image, such as a chart or diagram, used to represent information or data. Infographics make complex information eye-catching, shareable, and easy to digest. • For an easy-to-use infographic creator, visit: https://piktochart.com/.
Blog Post(s)	• Platforms may include Kidblog, WordPress, Blogger, Tumblr.
YouTube Video	• Students create a video about their project or make a recording of their presentation. To learn more about getting started with YouTube in school, visit: https://www.campussuite.com/blog/create-youtube-channel-for-your-school