# *Analyzing Science Practices and Concepts in* Wild Hope

hhmi | BioInteractive

Activity
Student Handout (NGSS)

## INTRODUCTION

You will watch an episode from the film series *Wild Hope*, which highlights people working to protect a species or ecosystem. You will also observe science practices and concepts in the film that are important for learning about and practicing biology.

## PROCEDURE

Answer the following questions based on the episode. You can complete the questions in any order and return to previous questions as you learn new information.

1. Define the problem that the people in the episode are trying to solve.

2. Describe the questions that they are attempting to answer to help figure out solutions.

3. Who are the key players (people or groups) in the episode?

4. Review the "Science and Engineering Practices" list at the end of this handout. In the following table, record the ones that you observed in the episode and provide supporting evidence for your choices. (Not all of them will necessarily be in the episode, so you don't need to fill in all the rows.)

| Science and Engineering Practice | Evidence |
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5. Review the "Crosscutting Concepts" list at the end of this handout. In the following table, record the ones that you observed in the episode and provide supporting evidence for your choices. (Not all of them will necessarily be in the episode, so you don't need to fill in all the rows.)

| **Crosscutting Concept** | **Evidence** |
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6. What progress has been made in solving the problem you identified in Question 1?

7. What other questions do you have about the episode?

**SCIENCE AND ENGINEERING PRACTICES**

Practices that scientists use to investigate the world and that engineers use to design and build systems.

1. **Asking Questions and Defining Problems**
   To figure out how the natural world works, we ask questions about phenomena we observe or measure. We can use these questions to make sense of new information and move our understanding forward.

2. **Developing and Using Models**
   Models are anything we create that represents how we understand a phenomenon. To help make sense of the natural world, we develop and use models that represent our ideas. We can use models to visualize and explain natural phenomena. We can also revise models when we learn something new.

3. **Planning and Carrying Out Investigations**
   We can investigate questions and solve problems in a variety of ways. Some ways include laboratory experiments, field observations, data collection, and other problem-solving activities.

4. **Analyzing and Interpreting Data**
   Identifying patterns, constructing meaning, and pulling evidence from data helps us explain natural phenomena. We can make sense of data using a variety of tools, including tables, graphs, and statistical methods.

5. **Using Mathematics and Computational Thinking**
   We can use math as a tool to figure out and explain phenomena. Mathematical and computational thinking can help us identify patterns in data, model systems, and discover relationships between different parts of a system.

6. **Constructing Explanations and Designing Solutions**
   A goal of science is to construct explanations for natural phenomena. Scientific theories help us explain phenomena. As theories become even more well-supported or refined over time, we can construct more complete explanations.

7. **Engaging in Argument from Evidence**
   We use scientific arguments to present and evaluate explanations of natural phenomena. We can identify the best and most current explanation by compiling and evaluating evidence. As more evidence emerges through scientific discovery over time, we can develop and argue for better explanations.

8. **Obtaining, Evaluating, and Communicating Information**
   Scientists communicate their findings so that others can evaluate and critique their data. This allows others to learn about their findings and apply the results. We can read sources of scientific information and summarize the key ideas to strengthen our understanding of a phenomenon.

**CROSSCUTTING CONCEPTS**

Concepts that apply across all domains of science and thus connect different domains.

1. **Patterns**
   Observing and defining patterns in natural phenomena helps us identify possible relationships between them. We can explore these connections to better understand the relationships that exist.

2. **Cause and Effect**
   Making sense of the causes of natural phenomena helps us better understand our world. To identify a cause, we define patterns that we observe to determine whether the phenomena are truly related or only happen to occur together by chance.

3. **Scale, Proportion, and Quantity**
   Natural phenomena occur at every scale and in different quantities. To find relationships among phenomena, we need to consider how the size and quantity of the components may affect the system we are observing. The size and quantity of a phenomenon also determines whether it can be observed and studied directly or indirectly.

4. **Systems and Systems Models**
   The natural world is too complex to study all at once. To figure out phenomena, we study the components and the relationships between them. We call these interacting components a system. We can develop models that help us identify and explain the components of a system and how they interact. Models can help us understand the system and make predictions about how it works.

5. **Energy and Matter**
   Energy and matter exist at all scales. All natural systems contain matter and use energy. As energy flows through and is used within systems, it drives the cycling of matter. We can examine and model the interactions between matter and energy to explain how systems work.

6. **Structure and Function**
   The structure, or shape, of an object often determines how it functions in a system. Knowing the structure and function of objects at different scales can help us explain natural phenomena and how they work in the natural world.

7. **Stability and Change**
   Some factors cause systems to remain stable or change over time. Identifying these factors helps us understand and explain natural phenomena.