

TTCD Lesson Plan (28): Scientific Observation

Unit: Scientific Observation	Grade(s): All	Class Size: 1-30	Lesson Duration: 1 hour	Location(s): Classroom
Topic(s):	Scientific Observation			
Student Prerequisites:	N/A			
Essential Questions:	What is scientific observation? How do we better understand our natural environment through scientific observation? What senses can we pay attention to in order to learn more about our environment?			
Student Objectives:	Students will be able to explain why scientists document what they find, observe, and collect. Students will practice observation and recording skills by making and using field journals. Students will learn how detailed observation and field notes can help us understand our natural world.			
Standards:	Supports NGS Standards: G1-SG-3: Understand that scientific knowledge is ongoing and subject to change as new evidence becomes available through experimental and/or observational confirmation(s). G1-SG-4: Understand that advancements in science depend on curiosity, creativity, imagination, and a broad knowledge base. MS-LS2-1: Analyze and interpret data to provide evidence for the effects of resource availability on organisms and populations of organisms in an ecosystem. MS-LS2-2: Construct an explanation that predicts patterns of interactions among organisms across multiple ecosystems. Relevant NGS Crosscutting Concepts: Patterns: Patterns can be used to identify cause and effect relationships. Cause and Effect: Cause and effect relationships may be used to predict phenomena in natural or designed systems. Stability and Change: Small changes in one part of a system might cause large changes in another part. Science Addresses Questions About the Natural and Material World: Scientific knowledge can describe the consequences of actions but does not necessarily prescribe the decisions that society takes.			

	Cultural Standards E.1: Culturally-knowledgeable students demonstrate an awareness and appreciation of the relationships and processes of interaction of all elements in the world around them by: recogniz[ing] and build[ing] upon the inter-relationships that exist among the spiritual, natural and human realms in the world around them, as reflected in their own cultural traditions and beliefs as well as those of others; E.2: Culturally-knowledgeable students demonstrate an awareness and appreciation of the relationships and processes of interaction of all elements in the world around them by: understand[ing] the ecology and geography of the bioregion they inhabit;
Local Context:	Students will observe the environment within walking distance of the Tebughna School. Through direct observation and note-taking, students can better understand their local ecosystem and feel empowered to engage in scientific observation in their own backyard.
Vocabulary:	Observation: the act of noticing or perceiving something, and recording the information gathered Field Journal: a notebook to record what you find, observe, and collect in the natural world. Senses: the ways in which the body receives signals from the environment. The five human senses are sight, hearing, smell, taste, and touch.
Dena'ina language words:	
Materials:	• Construction paper squares, 4.5 in. x 6 in. [two for each student] • Field Journal pages [6-10 for each student]: https://www.uaf.edu/museum/education/educators/teaching-through-collecti/pdfs/Teaching-Through-Collections-Field-Journals.pdf • Twigs (about 4 in. long) or popsicle sticks [one for each student] • Rubber bands • Two-hole punch • Colored pencils, crayons, or markers • Pencils • Speaker
Instructor Prep:	Cut paper ahead of time so all materials are ready. Test speaker volume to ensure all students will be able to hear the podcast episode.
Introduction:	Introduce the concept of a field journal: a notebook to record what you find, observe, and collect in the natural world. Ask the class: can you describe an animal or plant you saw recently? What details did

	you observe? What senses did you use to observe it? Would it have helped to write down what you saw? Ask the class: What can we learn from keeping and reading field journals? Learning where certain species are located, how many of a species there are in a specific place, how species and landscapes change over time, how species interact with one another.
Activity	Lead students in making their own field journals. 1. Have students choose two pieces of construction paper for covers. Take 6-10 blank field journal pages and put them between the covers. 2. Line up the edges of the papers. Hole punch two holes on the side. 3. From the back, pull one end of a rubber band through one hole and the other end through the other hole. Poke a twig or popsicle stick through the ends of the rubber band. 4. Decorate the covers with colored pencils, markers, or crayons. Encourage students to personalize their field journals. 5. Explain to the students that we are going to go outside and everyone is going to pick a spot from which they can sit quietly for 5-15 minutes, writing/drawing what they observe. 6. Discuss the different ways that students can record their observations (sketches, descriptions, diagrams, maps, lists, etc.). There are many ways to keep a field journal. Some scientists record their observations with charts and lists, some paste in leaves, or draw pictures, while others write long, detailed descriptions. Your field journal will be unique, reflecting your personal style. 7. Each time you go into the field, write down some basic information: Date and time of day, location. Use your senses. Ask the class: What are the senses you can pay attention to in order to help you observe your environment more closely? What you see, what you hear, smell, and feel. 8. Give the students some questions to help them get started: What do you see? Do you see anything that surprises me? 9. Head outside and give students between 5 and 15 minutes to journal.
Wrap-Up:	Afterward, discuss the experience as a group. Give each student time to share out with the rest of the class: What did they see and experience? Did anything surprise them? Did they draw anything to share with the class? Discuss the following questions with the class: • Why do scientists keep field journals?

	• What can we learn about the world around us from field journals? • After recording your observations in a field journal, what can you do with that information? (add it to a database, use observations to conduct an experiment, make a checklist of species, write a story, make a documentary). <i>Evidence of Learning:</i> Students describe field journals as a source of evidence for scientific research, a way to track changes over time, identify patterns, accurately document findings. They serve as a reliable record of what scientists see and experience in the field, providing concrete evidence for their study. Closing Question: What do you think makes someone a scientist?
Lesson Adaptations:	• Have students pick one sense to focus on for their field journaling session. At the share out after the lesson, ask the class what they think the benefits and downsides are of observing the world through just one sense. What is lost? What is gained?
Extensions:	1. For older students, play this podcast episode where park ranger Rick McIntyre uses his field notes and observation to tell the story of two wolves in Yellowstone (20 mins): https://www.thisamericanlife.org/815/how-i-learned-to-shave/act-two-15 a. Lead a follow up conversation with the class, asking, “How does scientific observation help us tell stories?” 2. Instruct each student to find a leaf they like and lead a leaf drying/pressing workshop, asking students what a single leaf can tell us about our environment? (the season, the health of a tree, the species of a tree): https://forestryandland.gov.scot/blog/pressing-autumn-leaves
Reflections:	How did it go? What did students understand most/least? What could change about instruction or lesson plan?
Resources Used:	Activity: Field Journals How to Preserve Leaves and Plants This American Life: Raised by Wolf