# Arroyo Walk

Introduction, Lesson 1

**Lesson Summary:** Students will do an initial investigation of the arroyo, exploring the plants, geology, and how the arroyo relates to the surrounding environment.

**Suggested Timing**: 1 hour (assuming 10 minutes travel time)

**New Mexico State Standards**

**Performance Expectation(s):** MS-LS2-4: Ecosystems: Interactions, Energy, and Dynamics: Construct an argument supported by empirical evidence that changes to physical or biological components of an ecosystem affect populations.

| **Science & Engineering Practices:** | **Disciplinary Core Ideas:** | **Crosscutting Concepts:** |
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| Engaging in Argument from Evidence: Engaging in argument from evidence in 6–8 builds on K–5 experiences and progresses to constructing a convincing argument that supports or refutes claims for either explanations or solutions about the natural and designed world(s). Construct an oral and written argument supported by empirical evidence and scientific reasoning to support or refute an explanation or a model for a phenomenon or a solution to a problem. | LS2.C: Ecosystem Dynamics, Functioning, and Resilience: Ecosystems are dynamic in nature; their characteristics can vary over time. Disruptions to any physical or biological component of an ecosystem can lead to shifts in all its populations. | Stability and Change: Small changes in one part of a system might cause large changes in another part. |

**Evidence Statements:**

- MS-LS2-4 Evidence Statements

**ELA CCSS Connections:**

- RST.6-8.1: Cite specific textual evidence to support analysis of science and technical texts. (MS-LS2-4)
- RI.8.8: Trace and evaluate the argument and specific claims in a text, assessing whether the reasoning is sound and the evidence is relevant and sufficient to support the claims. (MS-LS2-4)

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| Content Objectives and Daily Learning Targets | **Objectives**:<br>● I know what an arroyo is.<br>● I know where to find the arroyo in the neighborhood.<br>● I understand that arroyos provide habitat to a variety of plants and animals. |
| Focus Question | Where is my local arroyo and what does it look like? |
| Language Objectives | ● Students will express what they observe using writing, diagrams, and verbal means.<br>● Students will apply vocabulary to a new context in writing and orally. |
| Vocabulary | ● **Arroyo** - a dry creek, stream bed, or gulch that temporarily or |

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| | seasonally fills and flows after sufficient rain.<br>● **Ecosystem** - a biological community of interacting organisms and their physical environment.<br>● **Ephemeral** - lasting for a very short time.<br>● **Erosion** - process in which earth materials are worn away and transported by natural forces such as wind or water.<br>● **Flora** - the plants of a particular region, habitat, or geological period.<br>● **Fauna** - the animals of a particular region, habitat, or geological period.<br>● **Geology** - the science that deals with the earth's physical structure and substance, its history, and the processes that act on it.<br>● **Sediment** - solid material that is moved and deposited in a new location. |
| Materials | ● Science journals or clipboard and paper<br>● Pencils<br>● Colored pencils<br>● Meter stick or measuring tape<br>● Optional: collection bags for sediment<br>● Optional: field guides (plants, animals, etc)<br>● Optional: large buckets for each student to carry materials and then use as a stool when in the arroyo |
| Preparation before class | ● Walk to the arroyo that you plan to visit before your trip with your class. Ensure there is a safe way to get into and out of the space. Look for any potential hazards, like broken glass. Time how long it takes to get there and back.<br>● Follow any school regulations for leaving campus. |
| Assessments (Formative/ Summative), Rubrics, Success criteria | ● Student science journals<br>● Success Criteria:<br>○ Students have observed their arroyo and begun to make connections between the parts of the system<br>○ Students have verbally or in writing, come up with ways they think the arroyo was created using evidence |
| EL Supports | ● Students express their thinking using multiple modalities.<br>● Use pair-share to help students practice what they want to say.<br>● Provide vocabulary in English and the student's native language. |
| Culturally Relevant Strategies | Lesson centers on learning about the local environment, helping connect students with the space around them. Students are encouraged to write notes in whatever language they prefer. |
| <u>Special Education Modifications</u> | Ensure the path is ADA compliant, if students have physical limitations. Encourage students to record what they notice in whatever format works best for them, including drawing, words, or video. |

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| | Depending on class makeup, students can also be assigned this work in small groups to encourage collaboration. |

**Lesson Plan Details**

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| Pre-lesson (Completed in the class prior to the outdoor excursion) | ● Review rules for being outside, reminding students that this is still in class learning time.<br>● Review consequences of not following the rules<br>● Discuss how to safely visit arroyos. Remind students that arroyos should never be entered if there is rain in the area.<br>● Review expectations of what complete science journal entries include:<br>○ Date<br>○ Time<br>○ Weather (Temperature, sun/cloud, etc)<br>○ Location<br>● If you are not using the handouts, have them record the following in their notebooks:<br>Arroyo Challenge:<br>● I will find and record information about 5 different plants<br>● I will describe the geology that I notice<br>● I will describe what else I notice<br>● I think this arroyo was formed when _____ |
| ENGAGE (~5 min): | ● Ensure all students have their materials<br>● On the walk to the arroyo have students walk with a partner and predict what they will see. Ask:<br>○ “What plants and animals do you think we will see in the arroyo? What do you think the soil and rocks will look like? What else do you think we might find?” |
| EXPLORE (~15 min): | ● Give students 10 minutes to explore and make notes in their journals about what they notice |
| EXPLAIN (~10 min): | ● Call all of the students together. Ask them to share what they have noticed. Ask them to share what questions they have.<br>● Ask students if they have heard the term “arroyo” defined.<br>● Have them try to define it. Ensure that they understand that it is an area where water episodically flows, usually just in times where there is adequate precipitation. Clarify the difference between an ephemeral arroyo and a perennial stream. A perennial stream has water running through it all the time. An arroyo only flows after a rain event.<br>● Introduce the term “erosion”<br>● Share the tools you brought for them to use, such as the meter stick and field guides. The measuring tools can be used to determine arroyo depth, measure plants, etc.<br>● Remind them that you expect their journals to include the information that they recorded earlier (plants, geology, notes, arroyo formation) |

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| ELABORATE (~15 min): | ● Have students return to their science journals to continue to record data, add detail, and use the tools you provided.<br>● Circulate to encourage detail in their notebooks. |
| EVALUATE (~15 min): | ● Ask students to pair-share.<br>○ What was the most interesting thing you noticed today?<br>○ What claim can you make about how this arroyo got here? What evidence do you see that makes you say that? How does this evidence support the claim you are making?<br>● Walk back to school |

Additional Sources:

- 5 Es of Science Instruction
- 5E Model of Instruction
- ISEC model of lesson sequence