Observations with Leopold

Grades: K-5

TEKS:
K: 1A-G, 3A-C, 4A-B, 5F-G, 6, 11
1: 1A-G, 3A-C, 4A-B, 5F-G, 6A, 11A
2: 1A-G, 3A-C, 4A-B, 5F-G, 6A, 11B
3: 1A-G, 3A-C, 4A, 5F-G, 6A, 11B-C
4: 1A-G, 3A-C, 4A, 5F-G, 6A, 11B
5: 1A-G, 3A-C, 4A, 5F-G, 6A, 11, 12A & C

Topics:
Biotic (living) /Abiotic (nonliving)
Habitats and Ecosystems
Human Activity/Environmental Impacts
Natural Resources
Plants
Scientists/Naturalists
Wildlife

Methodologies:
Critical Thinking
Journaling
Measurement
Observations/Qualitative/Quantitative

Setting: Classroom and Outdoors

Activity Time: 45-60 minutes

Additional Subjects: Art

Objective:
Students will recognize Aldo Leopold as a famous conservationist and discover the methods he used to collect data through observation. These methods include the use of his senses and standard and non-standard measurement.

Materials:

Provided	Not Provided
Activity Page	Journals
C.A.R.E. Acronym	Pencils
	Hand lenses
	Metric rulers
	String or yarn
	Balance or triple beam balance scales

Vocabulary:
conservation, environment, living, nonliving, natural resources, wildlife

Observations with Leopold

Background:

There are many ways and methods to observe the world around us. An observation can be something as simple as using our senses as a learning tool, to more scientific methods of data collection. Aldo Leopold, a famous conservationist and writer, born in Wisconsin in 1887, used many types of observations as he observed the natural world. To many, he is considered the father of wildlife management and is known for taking his time to discover the wonder of the world around him. Leopold believed in keeping accurate records of his observations and relied heavily upon his senses. He wanted people to discover the beauty of nature, including in places such as a schoolyard or a playground. Leopold believed that life's greatest possessions were those things found in nature. One of his many quotes referring to nature is as follows.

"Teach the student to see the land, to understand what he sees and enjoy what he understands."

Throughout this lesson, stress the importance of stewardship as taking care of living (biotic) and nonliving (abiotic) things, such as keeping water free of pollutants so that it will remain healthy for wildlife to drink. Post and review the following acronym with students.

C Care for the protection of wildlife and their habitats.
A Act to become a steward of water, land, and wildlife.
R Represent stewardship by being a positive role model for others.
E Educate others about stewardship and conservation.

Activity Preparation:

- Make copies of the Activity Page, for each student, or project on the screen for students to reference if writing the data in their journal.
- Identify an outside area on the school grounds that students can visit with limited distractions as a class during the activity.

Procedure:

Discussion

1. Engage students by showing the following YouTube video about the life and legacy of Aldo Leopold, Aldo Leopold Nature Center - Foxfires & Fireflies, KelleyVanEgeren (3:25).

2. Ask students the following questions, and have them share their answers with the class.
   - Why do you think Aldo Leopold cared about the world around him?
   - When you hear the term "natural resources" what do you think of? *They are things found in nature such as rocks, metal, trees, plants, animals, water, oil, gas, etc.*
   - Why do you think Leopold made sure his children experienced nature just as he had?
   - What is wildlife? *Wildlife consists of plants and animals in nature that do not have caretakers.*
   - Do you care about the world, including its wildlife? Why?

3. Arrange students in groups and ask students how scientists such as Aldo Leopold gather information about an object. Allow time for students to share their thoughts with their group and then direct them to take turns sharing with the class.

4. Guide students to an understanding that scientists use observations to collect information to learn about the natural world. Explain that Aldo Leopold was a famous scientist that used observations to help him to answer questions. Two basic types of observations were used by Leopold and are still used today. One observation type is using one or several of the five senses; the other is collecting numerical data by measuring or counting.

5. Ask students to recall the names of their five senses. Use the board to record each of the senses.

Activity A – Introduction and Journal Observations

1. Instruct students to place their journals on their desks or tables. Provide students with hand lenses.

2. Instruct students to use their senses to make observations about their journals. Review the five senses of sight, smell, sound, touch, and taste. Encourage students to use descriptive words, as if they were an artist painting a picture. *Example: The journal is black and white. Better Example: The journal is black with white speckles distributed throughout. It feels smooth. It is solid.*

3. Remind students of necessary safety procedures for observing smell and taste with their nose and mouth. When they smell any object, they should be "wafting." Demonstrate wafting by sweeping your hand towards your nose and explain that this is a safer way to smell unknown things. In addition, students are not to taste an object without permission from the teacher.

4. Next, provide students with metric rulers, string, or yarn.
   - For students lacking measurement skills, use items such as string or yarn to take non-standard measurements.

5. Tell older students that making observations of physical properties includes taking measurements of objects, including length, width, height, volume, or mass, and write these words on the board. The United States uses a different standard unit of measure than most other countries in the world. The worldwide unit of measure is the International System of Units (SI), which is known as the metric system. The measurement system in the United States uses miles (versus kilometers), feet (versus meters), and inches (versus centimeters). Leopold made observations using standard measurement units as well as non-standard measurements using string or yarn.

6. Instruct older students to use the rulers to measure the length and width of their journals. If time allows, provide groups of older students with a balance scale or triple beam balance to find the mass of one journal. Instruct younger students to use yarn or string to measure the length and width of their journals.

7. Observations may also be determined by collecting numerical data to determine how many objects there are by counting. Leopold also used this method for making observations.

Activity B – Outdoors Observations

1. After practicing the different methods of observation, tell the students they are going outdoors for an observation hike.

2. Take hand lenses, string, yarn, or metric rulers along with copies of the activity page to be distributed, and guide students outdoors with their journals.

- Students may copy the chart from the activity page into their journal as an alternative to making copies.
- Discuss safety issues related to the outdoor learning environment. Review or introduce the term “environment” as all aspects of an organism's surroundings.

3. Explain that Leopold kept a pace, known as a saunter, when making observations. To model Leopold’s saunter, instruct students to walk in a slow, relaxed manner, without hurry or effort, at a pace that allows them to look around and observe nature. Allow students to make observations while they practice sauntering.

4. Next take the students to a location where they can spread out and sit. Allow students to sit very quietly and listen to noises made by nature for several minutes. Students can write in their journals the noises they heard, or after quiet time is over take turns sharing what they heard with the class. Encourage students to use descriptive words or adjectives.

5. While seated, ask students to locate either a living (biotic) or nonliving (abiotic) object such as a tree, flower, bush, or rock. Have students take turns sharing observations of the object on which they have focused. Ask how many senses they used to observe the object. Ask how many of them made an observation using accuracy, such as counting.

6. For younger students:
   - If students lack writing skills, initiate a conversation with them about using their senses to observe their objects. Review each of the five senses again, by asking students to take turns sharing their findings with the class. Allow them to practice wafting, as they smell their object. Remind students not to place the object in their mouths. These students may use the activity sheet or journal to draw their objects.
   - Distribute hand lenses, metric rulers, string, or yarn as requested. Direct students to make observations using one of two methods: standard measurement or counting, or using non-standard measurements such as measuring with string or yarn.

7. For older students:
   - Students will need a copy of the activity page, either printed or in their journal.
   - Distribute hand lenses, metric rulers, string, or yarn as requested.
   - Instruct students to record their observations using their senses or by using numerical data.
   - Give students time to make their observations and record their data, just as Leopold once did. Ask students to draw and label the object, in their journal or on the back of the activity page. Instruct students to identify their object as a living (biotic) or a nonliving (abiotic) thing.

Wrap-up

Close the lesson by asking students the following questions:

- What can you do to make the schoolyard a better place for plants and animals?
- Why are the types of observations Leopold used important?
- How often do you use these types of observations?
- How can using Leopold’s teachings make the world a better place?
- Based on your observations, what can you do to support the organisms in your schoolyard?

Extension:

For older students, refer to the quote in the Background Section of this lesson and ask students to interpret its meaning.