



Time:

(1) 45 minute classroom session

Level:

Grades K-12
Standards selected for grades K-2, 4, and Secondary Science

Goals:

Students will begin to use naturalist skills in the context of nature journaling to work towards creating an interpretation of their experience in Utah's mountain ecosystems.

Objectives:

Students will be able to

1. Discuss and explain the benefits of detailed observation
2. Closely observe and draw something from the natural world in their Nature Journals
3. Analyze and discuss the work of other naturalists
4. Explain why their nature journal will be so beneficial to them

Materials listed with each individual activity.

An Introduction to Nature Journals

by Alex Porpora, Neicca Butts, and Mark Larese-Casanova

Correlations to Core Curriculum:

Grades K-2

- Standard 1: The Processes of Science, Communication of Science, and the Nature of Science. Students will be able to apply scientific processes, communicate scientific ideas effectively, and understand the nature of science.
 - Objective 1: Generating Evidence: Using the processes of scientific investigation (i.e. framing questions, designing investigations, conducting investigations, collecting data, drawing conclusions)
 - Indicator d: Collecting data: Deciding what data to collect and how to organize, record, and manipulate the data.

4th Grade

- Standard 5: Students will understand the physical characteristics of Utah's wetlands, forests, and deserts and identify common organisms for each environment.
 - Objective 1: Describe the physical characteristics of Utah's wetlands, forests, and deserts.
 - Indicator b: Describe Utah's wetlands (e.g., river, lake, stream, and marsh areas where water is a major feature of the environment) forests (e.g., oak, pine, aspen, juniper areas where trees are a major feature of the environment), and deserts (e.g., areas where the lack of water provided an environment where plants needing little water are a major feature of the environment).

Secondary Science (Biology)

- Standard 1: Students will understand that living organisms interact with one another and their environment.
 - Objective 3: Describe how interactions among organisms and their environment help shape ecosystems.
 - Indicator d: Investigate an ecosystem using methods of science to gather quantitative and qualitative data that describe the ecosystem in detail.

Did you know?

Science notebooks (or nature journals) can be used at any grade level, ranging from kindergarten to twelfth grade (and beyond)! Teachers can adjust requirements, such as allowing younger students to draw what they see, and asking older students to use detailed writing, labels, and scientific drawings. Allowing students to keep a scientific notebook is much more engaging than worksheets!



Background Information:

A Natural History of a Mountain Year

A Natural History of a Mountain Year, written by Claude T. Barnes, chronicles a year along the Wasatch Front. The entries, which were composed between the early 1920s to the late 1950s, juxtapose personal narrative with detailed observations of the natural world. Barnes shifts from describing the landscape at large to detailed description of organisms and he does this primarily through the written word. The book encompasses both scales of time – year, season, month, day – and environmental scales – ecosystem, community, organisms, individuals. Barnes synthesizes these through personal narrative.

Barnes is a localized example of nature writing or journaling, but there are many other examples including Meriwether Lewis, Beatrix Potter, Olaus Murie, Aldo Leopold, Hannah Hinchman, and Rick Bass, just to name a few. This rich tradition encompasses a variety of styles and ways to interpret the natural world.

11 Experiments that Failed

11 Experiments that Failed, written by Nancy Carpenter, is the adventure of a young girl who is curious about the world around her. She records her hilarious experiments, along with predictions, observations, and conclusions. This is a fantastic book to demonstrate the importance of the scientific method, as well as scientific journals for young children.

Nature Journals

Journaling requires close contact with a locality and an intimate understanding of the environment. Being a naturalist is relevant in today's world because, as the Parish Mapping Project in England put it, "Everyday places desperately need our attention – partly because they are changing so fast, and not always for the better, but also because tremendous benefit is to be gained from a personal involvement with your own locality."

Great Sentence Starters

- I wonder...
- I observed...
- I expect to see...
- I was really surprised when...
- What if...
- This reminds me of...
- I see patterns in...
- My data shows that...
- This relates to...

Materials:

Supplies --

- Nature Journals – 1 per student
- Pencils

Equipment --

- Book – either *A Natural History of a Mountain Year* or *11 Experiments that Failed*, based on what is best for your grade level
- Small magnifying glasses (1 per student)
- Area to study and make observations of nature

Lessons and Activities:

Day 1 --

Engage (10 minutes) – Introduce the book of your choice (from the two listed in the ‘equipment section’). Explain to students that this book is a science journal, a place in which a naturalist recorded observations, experiments, and everyday scientific happenings. Give some background to the book. (If it the Barnes’ book, you may choose to tell students some background information about Barnes – the places where he studied, the years he kept these notes, and how the text is set up. If you are reading Carpenter’s book, simply introduce the book as a science journal of a young girl, just about their age. Allow them to put themselves in her shoes.) Read the book (or excerpts of Barnes’ book), and allow students to discuss why they feel it is important to keep science or nature journals.

Tell students that today, they will have an opportunity to start their own nature journal. Remember to clarify that science journals should be filled with things of a scientific nature. Explain that scientists draw things as they really see them, and that they use labels and descriptive words to clearly portray the things that they are observing.

Give each student, or have them create, a nature journal and ask them to label it with their name and any other identifying information necessary. Explain that for their first entry in their journal, they will be studying a small area, and noticing as many details as they possibly can. All of these details should be recorded or drawn in their science journal for future reference.

Before going outdoors to record observations, the date, time and location should be recorded. Ask participants why this would be important and if there is any other pertinent information they think should be included.

Explore (15 minutes) -- As a class, go outside. If possible, this fieldwork experience should be done in a large, open space where students can spread out. You may choose to do this activity in a mountain ecosystem, but if this ecosystem is not easily accessible any large, open area will work. Ask students to sit individually, and not in groups while doing this activity.

Observations will be recorded first through drawing, and then writing (if possible). The students will be asked to independently observe a very small space, just a few square inches. For an idea of perspective, have participants create a rectangle with their thumbs

Did you know?

There are many reasons to start science notebooking.

- It becomes a permanent record of student work
- It acts as a portfolio
- Creates an active learning environment (where students have to interact with the information) as opposed to a passive learning environment (where students simply receive the information)
- Organizes material and thinking
- Allows students to express their creativity
- Creates multiple opportunities for students to process information
- Personalizes the learning experience

<http://sciencenotebooking.blogspot.com/2008/11/why-start-notebooking.html>

and index fingers, or if they feel particularly detailed, create a circle using the index finger and thumb – this is the size of the space that should be attended to.

Have participants spend 5-10 minutes drawing what they see. They may use magnifying glasses to observe the area more closely, if desired. Quality does not matter so much as paying attention to detail. Spend another 5-10 minutes writing about what they are observing in detail, for example, as many words for color or texture as they can think of.

Explain (10 minutes) -- Have participants circle up outdoors or return to the class setting. Discuss the process of recording their observations. What made it difficult? Which parts were easy? Is there value to observing the natural world at such a small scale? Is there equal value to observing the world on a large scale? How will their nature journals be beneficial to them as individuals?

Discuss the question “Why should we draw the natural world?”
Answers may include: Drawing has a number of advantages. It can convey things or meanings that words sometimes cannot, not subject to technical failures in the field, drawing and text put together can communicate a vast amount of information, and drawing helps the drawer understand the subject in a more complete way.

Remind students that observation itself is empowering and can help us to form hypotheses and increase personal understanding.

Elaborate (10 minutes) – The students will be given a few minutes to look through examples of other nature journals and make some observations regarding techniques and details. They will then present their findings to a partner.

Finally, the students will work individually to think about how they can incorporate what they have learned in this activity to help them throughout the course and what may be helpful to them as they create their own nature journal. They will record their ideas within their nature journal.

Assessment:

The assessment in this activity is predominantly embedded into the activity. The students should be considered successful if they are able to explain why the naturalist relies on observation and why observation is a beneficial tool. They should have also created a detailed drawing of and written notes about an object in the natural

world. If desired, students can turn in their nature notebooks for assessment. This assessment should help the teacher to inform their instruction and make the teacher aware of student misconceptions. This assessment should not be used as a final grade for the nature journal.

If you would like to assign point value to the assignment, a rubric has been created for your use, and is attached at the end of the lesson plan. In order to use this rubric, you will need to ensure that students have adequate time to make a detailed drawing and write notes about the area they observed. In addition, before students turn in their nature journals, you need to have students do a quick write in their journals to answer the following two questions:

1. Why is observation an important tool for us to use?
2. What are two goals you have for your nature journal this year?

Students should answer both of these questions in complete sentences.

Extensions:

- Language Arts – Have students write in their nature journals daily, using a self start such as “I was surprised when...” or “My results of my experiment showed....” This self-starter can connect to previous experiences, which connects and helps students remember the science that they have been learning throughout the year.
- Art – Have students do a large scale drawing of something they drew in their nature journal. Display this on a bulletin board or in the hallway.

Resources:

Books

- *A Natural History of a Mountain Year* by Claude T. Barnes_
http://www.amazon.com/gp/product/0874804744/ref=ox_ya_os_product_refresh_T1
- *11 Experiments that Failed* by Nancy Carpenter_
http://www.amazon.com/gp/product/0375847626/ref=ox_ya_os_product_refresh_T1

Websites

- A great website with ideas for using science journals --
<http://www.sciencenotebooks.org/>
- Why and how to start science journals --
<http://sciencenotebooking.blogspot.com/2008/11/why-start-notebooking.html>

Nature Journaling Rubric

Student has created a detailed drawing of the area he observed (10 points)	Students has created a drawing with little to no detail (5 points)	No drawing was created in his nature journal (0 points)
Student has written detailed and clear notes about the area he observed (10 points)	Student has written a few basic (and somewhat clear) notes about the area he observed (5 points)	No notes were written in his nature journal. (0 points)
Student has explained why observation is an important tool to use in complete sentences. (10 points)	Student has explained why observation is an important tool to use, but not in complete sentences. (5 points)	There is no explanation of why observation is an important tool to use (0 points)
Student has written at least 2 goals for their nature journal for the year in complete sentence (10 points)	Student has written only 1 goal in a complete sentence OR student has written 2 goals, but not in complete sentences (5 points)	No goals have been written down for their nature journaling experience (0 points)

Student Name:

Points: /40