



Field Notebooks and Scientific Illustration Investigations for the Curious

At a time when it seems like most adults and children are hostage to some sort of screen, it may be a perfect opportunity to start a scientific journal or field notebook. Sketching in nature can be done with easy-to-find supplies and is a valuable skill for all learners despite their perceived artistic talent level. In fact, some of the most detailed and thoughtful notebooks I have seen have been submitted by my students who proclaimed that they “hated” art, disliked English class, and were just marginally tolerant during science lessons despite my best efforts to get them to think my schoolhouse lectures were incredibly fascinating. Also, as a field ichthyologist, my notebooks are still treasures that I have carefully packed up countless times over the (many!) years as I have moved from house to house. They have acquired much more personal meaning but less scientific relevance to me as they continue to also gather more rips, dog-eared pages, and a few splashed from my water bottle. But then again, so have I.



One of the best aspects of a field notebook is the necessity to pause and to carefully make and record observations, an essential skill for any citizen scientist, student, or naturalist. As a classroom exercise, I have seen several science teachers conduct preliminary work with their students directing them to draw an ice cube in stages as it melts, or a candle as it burns. You can well imagine the students’ initial question, “Wait, you want me to stare at an ice cube for 15 minutes?” But, taking a commonly-mundane item and an everyday process that everyone has witnessed encourages the observers to really get down to the detail. In one lesson, a high school teacher had some groups observe the candle and the others to observe the ice cube. They then compared and contrasted the experiences using their illustrations and notes as a guide. It is amazing what questions came from this simple activity.

**“There is no learning
without having to pose
a question.”**

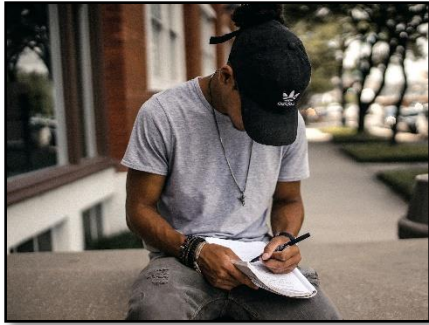
Richard Feynmann,
Noble Prize winning
physicist

For those of you home with children or family members, try this at the dinner table. Fold a piece of paper into 6 or so boxes and draw one of the items mentioned above every 5 minutes. You can enact a “no talking” rule. Six boxes, each 5 minutes... 30 minutes of quiet time and then lots to discuss during the meal!

Don’t Marginalize the Margins

While the illustrations are a key factor, they are not the only aspect that holds meaning in field notebooks, it’s also the areas that surround the illustration that may include: questions, insights, vocabulary, and interdisciplinary connections. This is also another element that students enjoy. It isn’t all about knowing the answer, as much as it is about posing questions and ideas, the answers to which can be determined at a later point through continued independent or group research.

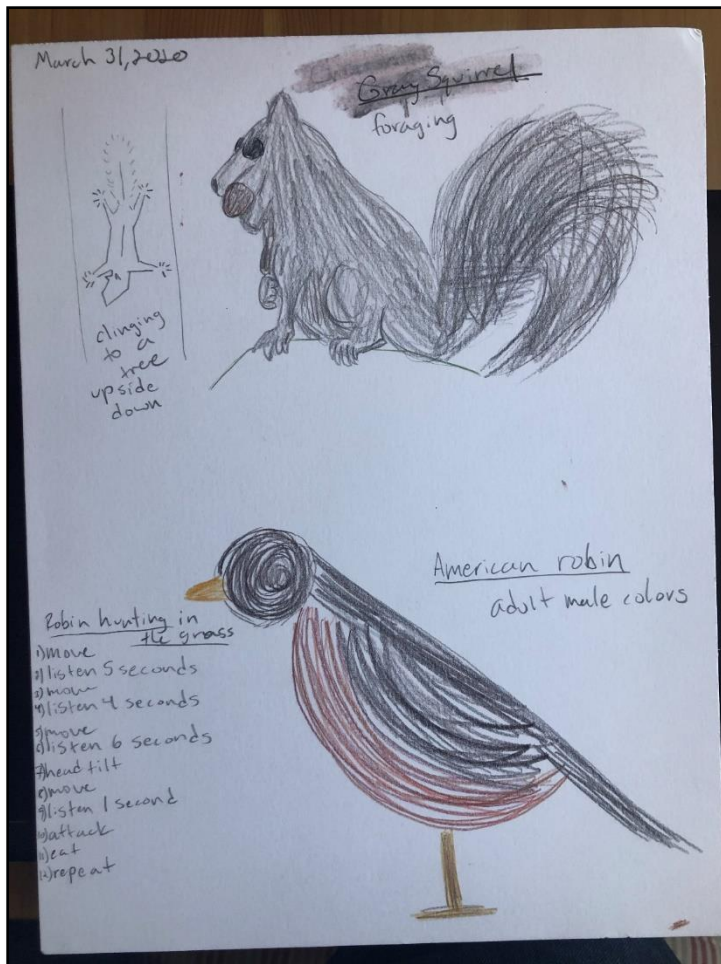
Most Importantly... GO OUTSIDE!



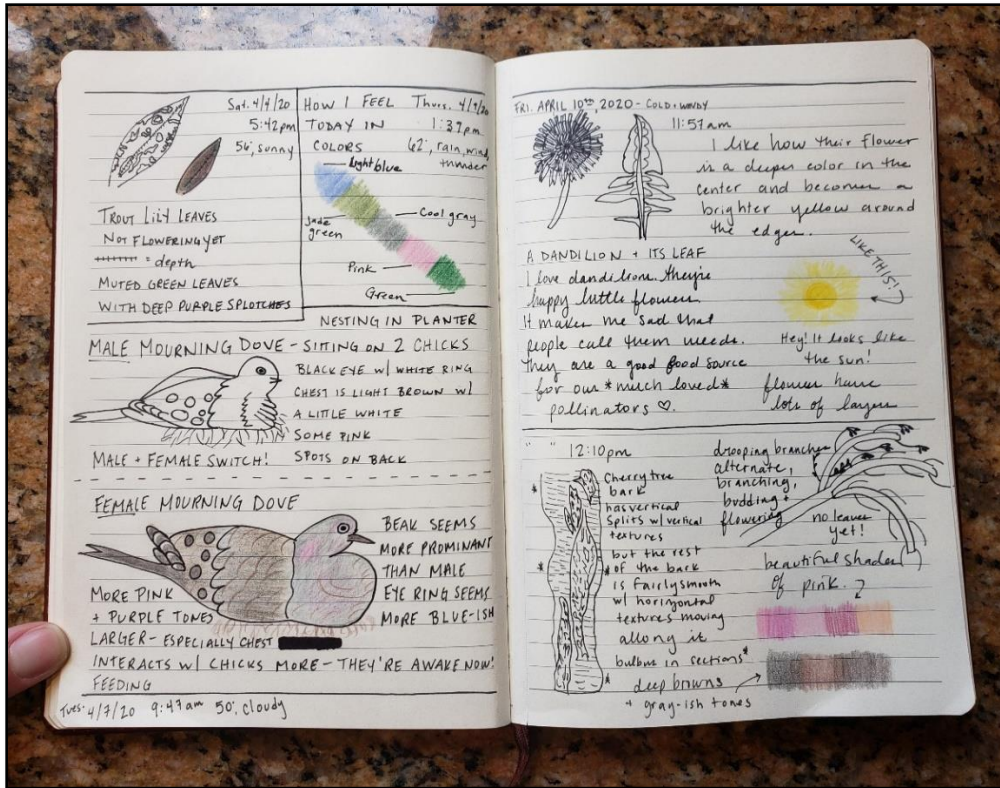
Urban, suburban, rural... there is always something to investigate. Even the briefest exposures to our natural world hold countless advantages to our physical, emotional and intellectual well - being.

Individual Styles

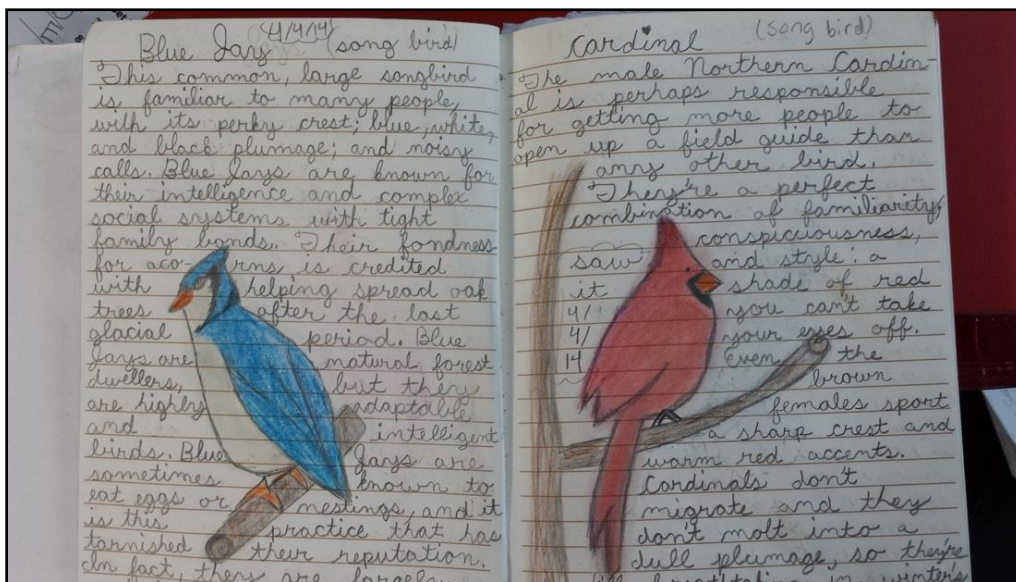
By giving very little direction, individuals will demonstrate their own style but “the look” is also based on the notebook’s purpose. If conducting research, perhaps there are specific criteria while those whose intent is to explore and observe may have less constriction. Furthermore, scientific notebooks are collections over time. In many cases, you will see how the beginning pages are quite different and less detailed than those created later.



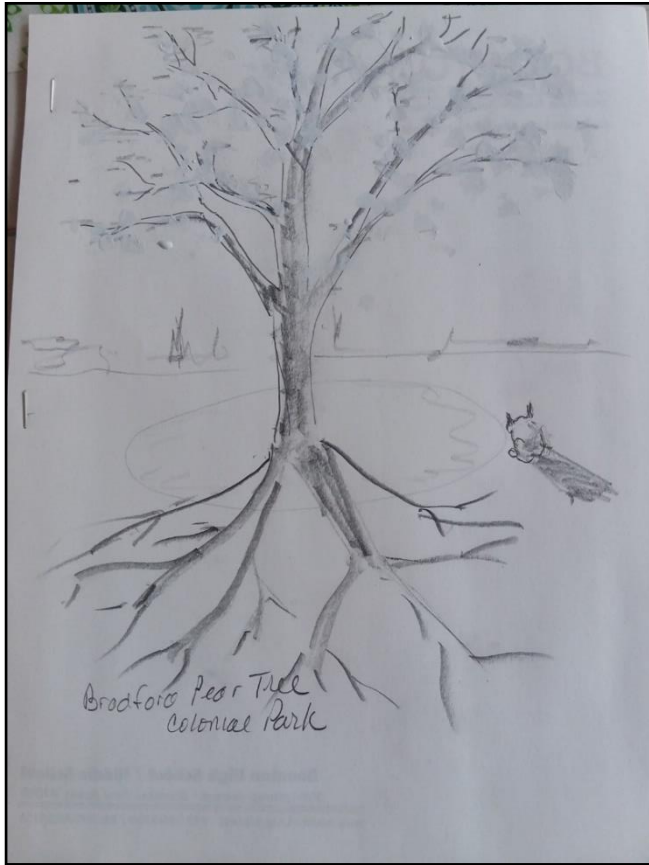
This science notebook entry demonstrates that the observer identifies the type of bird and its sex. Both the squirrel and robin entries provide detail about the animal’s behavior.



Notice the connections that are made while also including weather, time, personal reflections, scientific facts, and vocabulary: alternating branches, male/female coloration (sexual dimorphism), trout lily identification. These entries involve some colorful additions while the majority is designed in ink. The observer also shows a strong emotional attribute aligned with a color palette.



For those who like to do the research and like to write, this is a way to incorporate an illustration into the text.

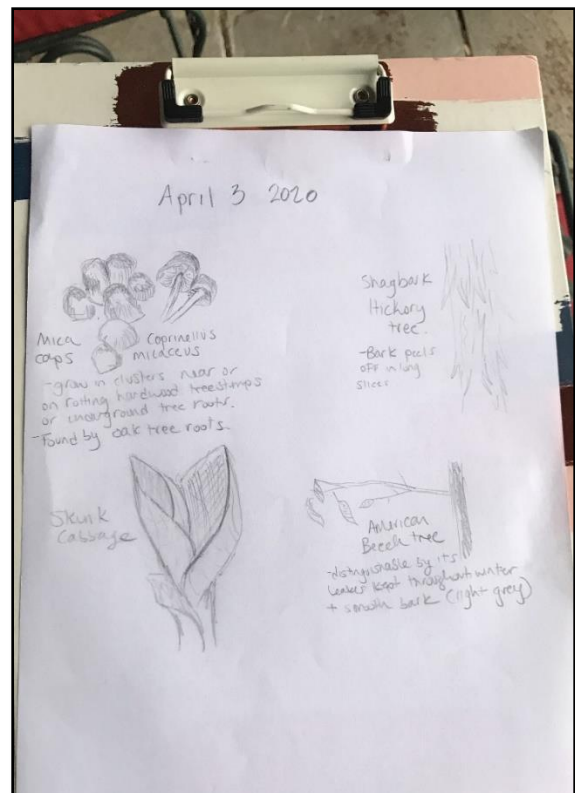


The influence of shadows in this drawing demonstrates this individual's observation about the sun. As a follow-up, a teacher/parent might ask for the individual to include related questions such as: Does the position of the sun change the colors that we see?

It may also interesting to draw this same tree during different times of the day. Would anything change?

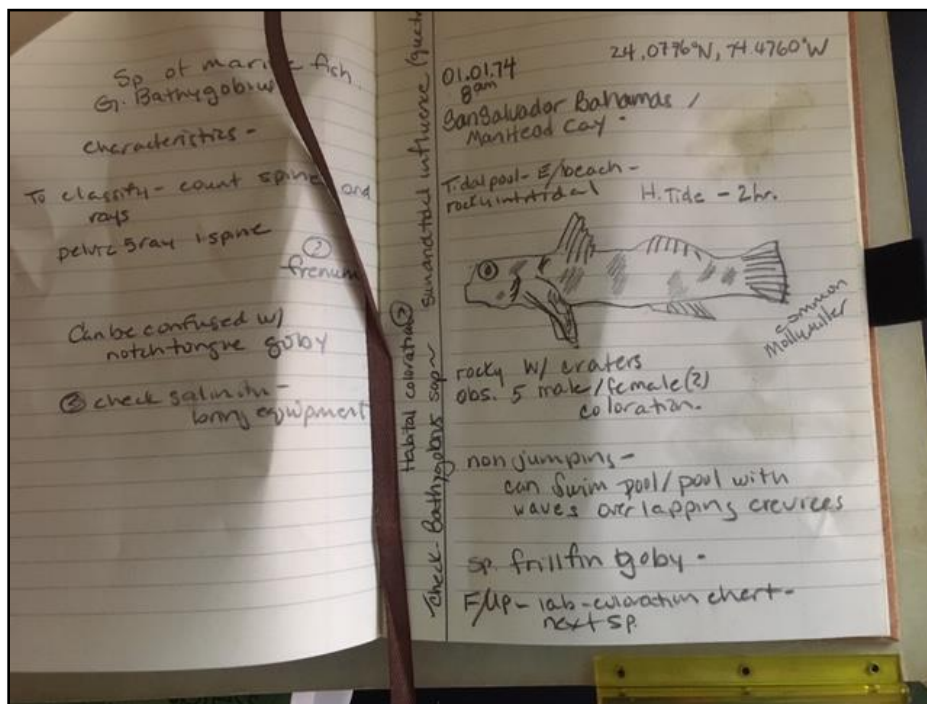
This notebook is fashioned from some recycled paper and staples. Recycled paper can suffice just as well as premier notebooks!

This clipboard entry shows multiple views of the same subject matter and includes a genus species label. The locations of where the plant was discovered are also included.



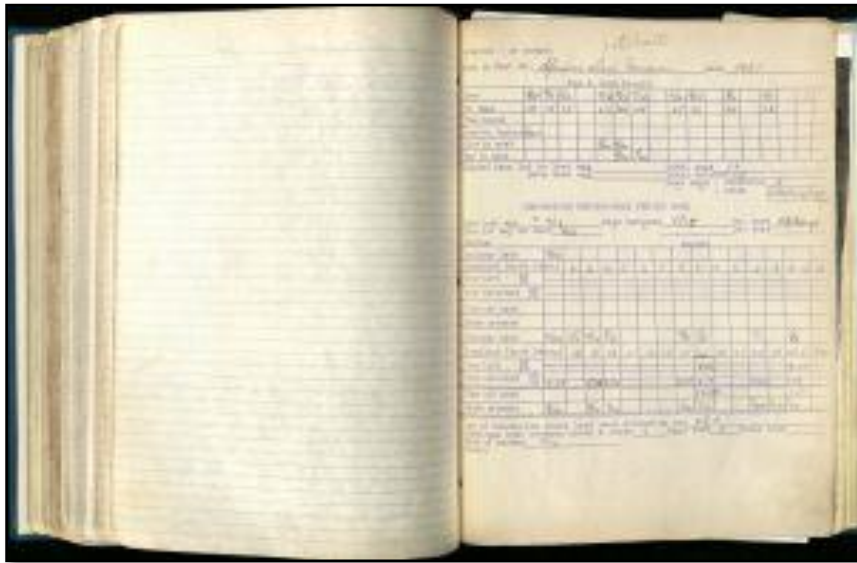


Notice the action that is described on this page. Normally, you would not think of plants in this way, but the descriptions provide an account of previous observations that are interwoven into a current "snapshot".



A page from my field notebook from a long, long, time ago in a location pretty far away. Paper and ocean spray are not a great mix, but generally field notebooks are not necessarily pristine. Rather, they get stuffed in back field pants pockets, backpacks, or in my case, a dive bag.

Historical Reference



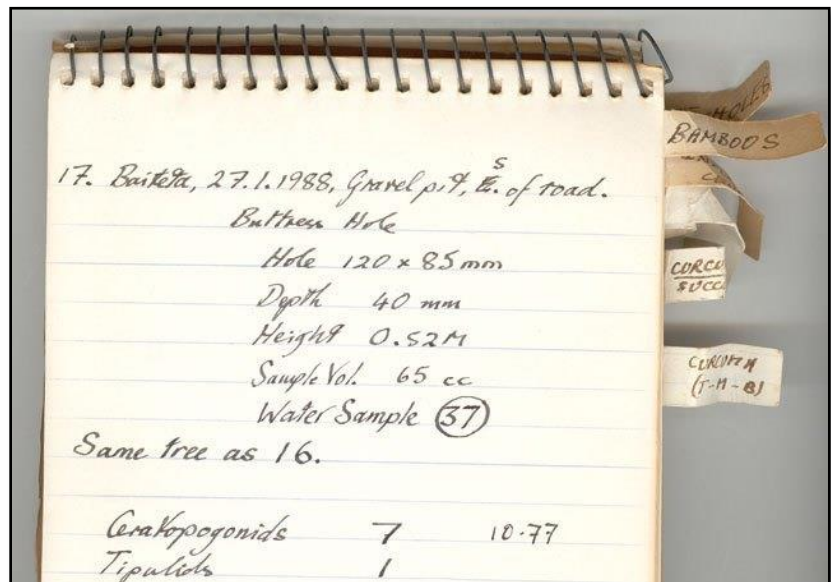
Field notebooks have been used for centuries, capturing the thoughts and ideas of our scientists and adventurers.

Aldo Leopold, (18887-1948) the famous American conservationist, is considered by many to be the father of wildlife ecology in the United States. He frequently kept his notes in a science notebook and captured ideas while out of doors.

Perhaps these notes were used in preparation for writing A Sand County Almanac.

Wood Duck Observations in the Scientific Notebook of Aldo Leopold

This is a page from a field notebook made in New Guinea on the food webs of aquatic animals known as phytotelmata that live in plant containers, such as tree hollows and bromeliad tanks. Roger Kitching, Ecologist, in 'A Reflection of the Truth'



Field Notes on Science & Nature 1st Edition by Michael R. Canfield



*Leonardo da Vinci On Plants and Gardens
by William A. Emboden*

This late 15C illustration from Leonardo da Vinci's notebook shows the study of a viola plant and how metal plates can be fused. Experts don't always know exactly why some illustrations are included together on one page, but some believe the picture themselves have no relationship to each other and that because paper was scarce and expensive, every page was maximized. Of particular note is da Vinci's mirror writing.

End Notes

The study of nature can be captured in your field notebook whether you are a dedicated scientist, novice explorer, or adventurer in your neighborhood. Developing and fostering a

“Those who dwell as scientists among the beauties and mysteries of the earth are never alone or weary of life. Those who contemplate the beauty of the earth find reserves of strength that will endure as long as life lasts.”

[The Sense of Wonder](#) by Rachel Carson

curiosity for how things live and behave can be a life-long passion, and once you start illustrating, I assure you that everything will now look more amazing than before you began this journey.

Photos by Dariusz Sankowski on Unsplash, Brad Neathery on Unsplash, and Weebly