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Enhancing Science Notebooks with Scientific Sketching and Nature Journaling

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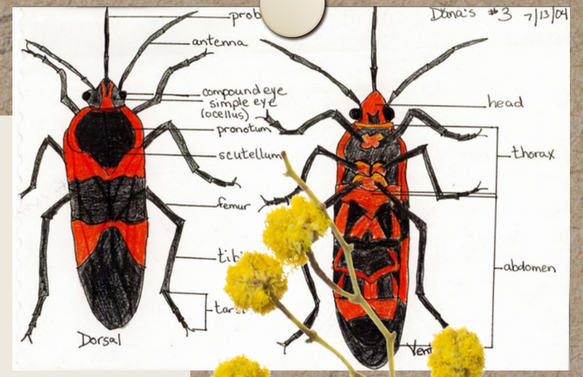
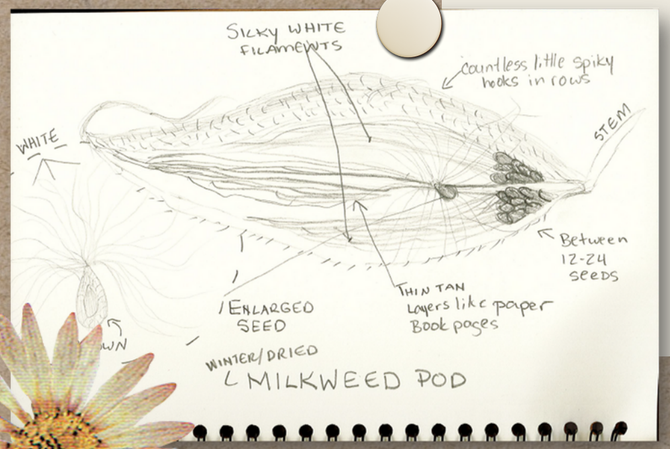


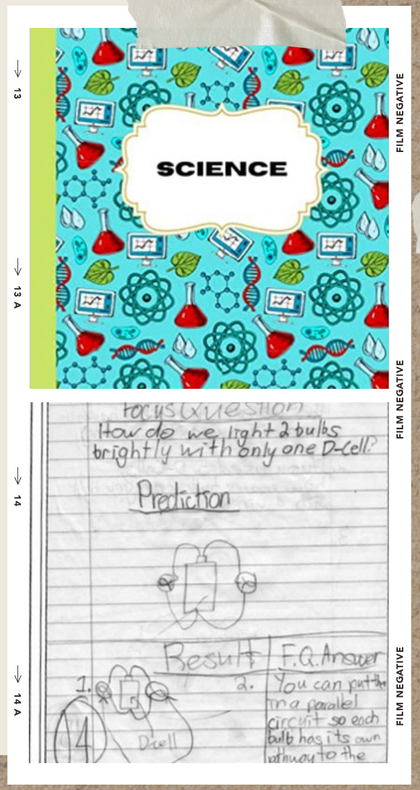


Science Notebooks

FOSS Notebooks

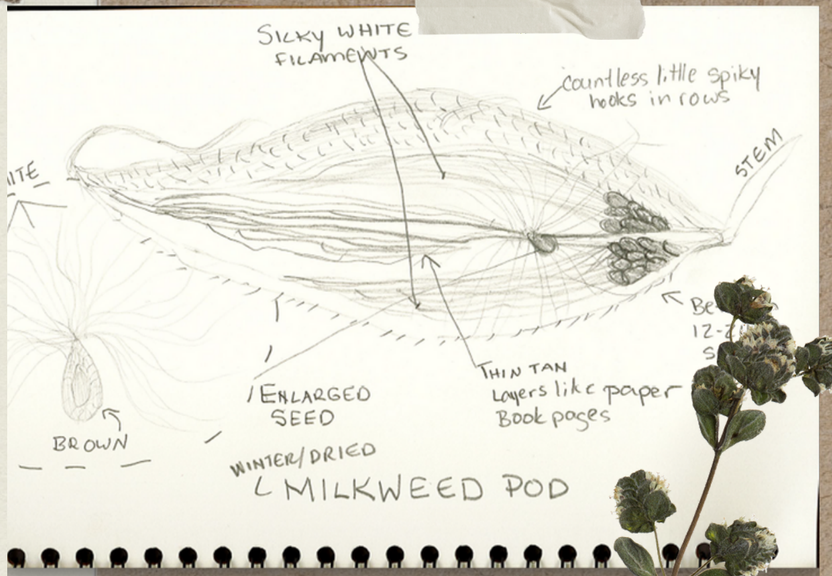
WHO IS YOUR EXPERIENCE WITH SCIENCE NOTEBOOKS?

- Who uses science notebooks already?
- How do you use science notebooks with your students?
- What have been the benefits?
- What have been the challenges?
- What's the difference between a Science Notebook and a Nature Journal?



"A scientist sketches to communicate information, not to make art."

CALIFORNIA ACADEMY OF SCIENCES, SCIENCE NOTEBOOK CORNER



Science Notebook Resources

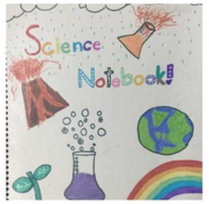
Organizing Your Science Notebook

Table of Contents

Date	Entry Title	Symbol	Page #
10/7/13	Serund Bowls Investigation & Notebook introduction	☆	3
10/16/13	Notebooks - prep talk	△	3
			4
			5
			6
			7
			8

Introductory Science Notebooking Activities

Browse these lessons to learn the basics of setting up science notebooks with your students. Once routines are in place, explore our other sections to learn more strategies for deepening your students' learning.



Decorate Your Science Notebook

Students receive their science notebooks and take the time to make them their own.

Science Notebooks Across Time

Students peruse sample page from the notebooks of many different scientists.

Draw a Scientist

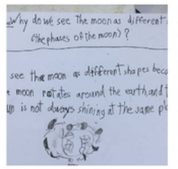
You Are Here: Introductory Activities

Strategies for Investigations

Learn how science notebooks can help your students plan and carry out hands-on investigations. From collecting data to constructing explanations, using notebooks can solicit and deepen your students' thinking.

Planning Investigations

Use science notebooks to make your classroom experiments both hands-on and minds-on.



Framing With a Focus Question

Make the most of investigations with clear and specific focus questions.

Carrying Out Investigations

How can notebooks enhance student learning during hands-on investigations?

You Are Here: Investigations

Strategies for Notetaking

Taking notes in science doesn't mean just copying what's on the board. Learn how students can make their own meaning, from drawing concept maps to unpacking complex vocabulary. These strategies will support your students before, after, and in-between hands-on investigations.

Brainstorming

Brainstorming is a great first step to many investigations.

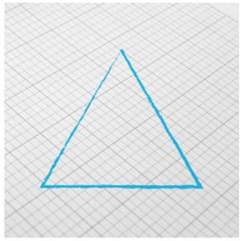
Active Reading Strategies

Have you used notebooks to help your students understand science texts?

Scaffolds for Field Trips

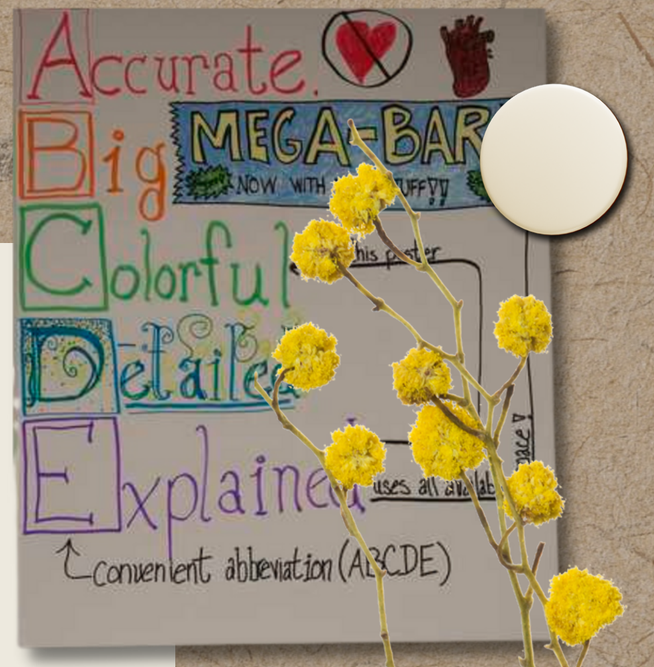
Use notebooks to help students learn actively during field trips.

You are Here: Notes



CALIFORNIA ACADEMY OF SCIENCES

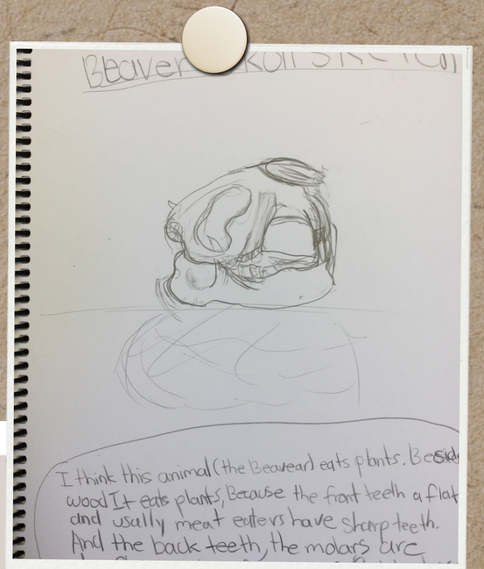
Introduction to Scientific Sketching

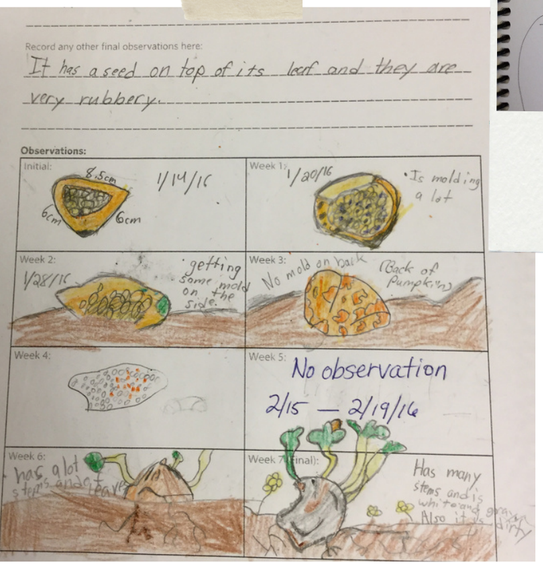


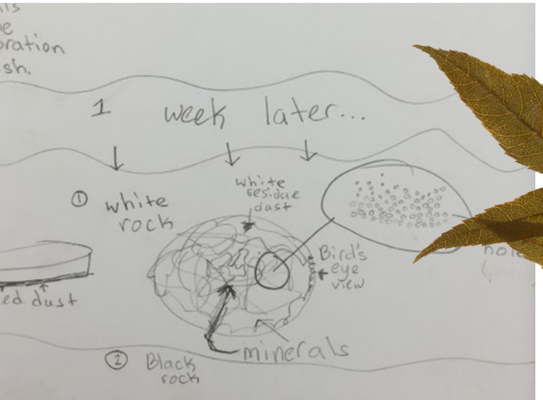
Four quick introductory activities:

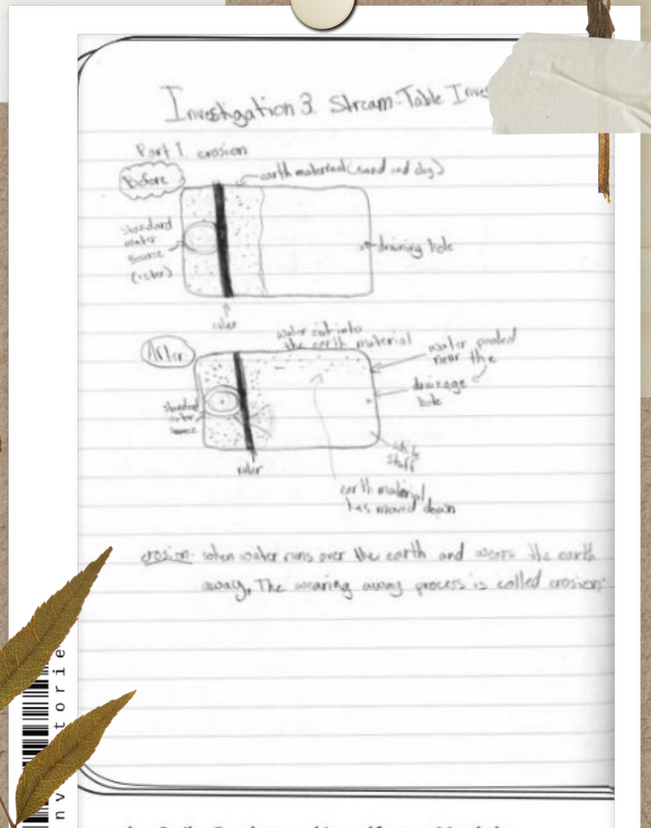
- Exercise #1: Blind contour drawing
- Exercise #2: Breaking into Shapes
- Exercise #3: Disappearing Images
- Exercise #4: Quadrant Drawings

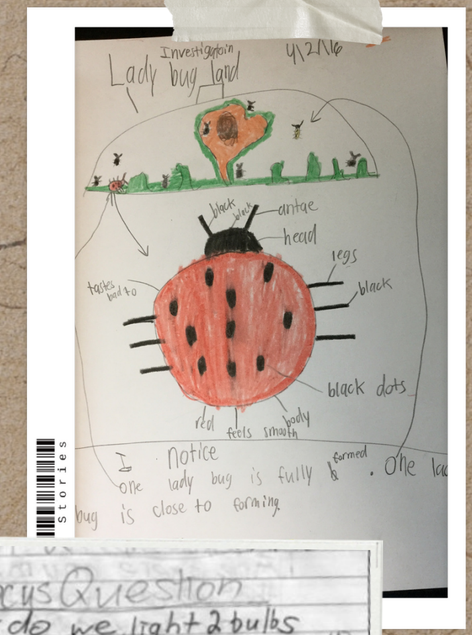
Student Scientific Sketching Examples

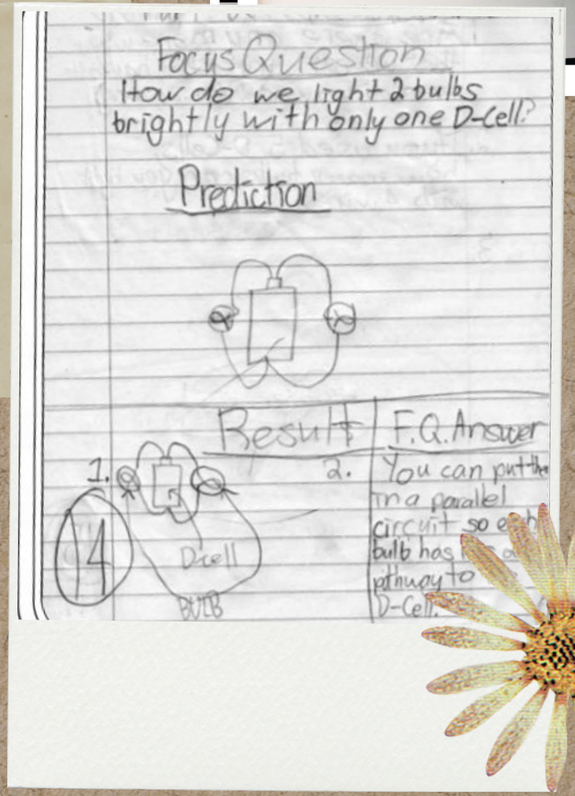




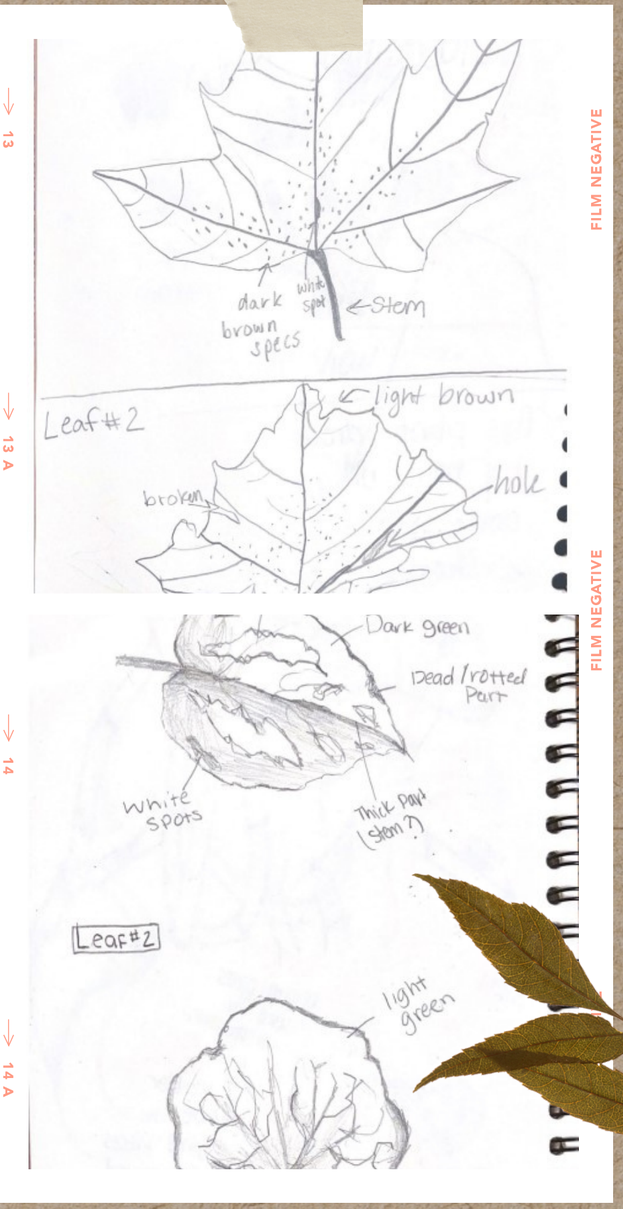


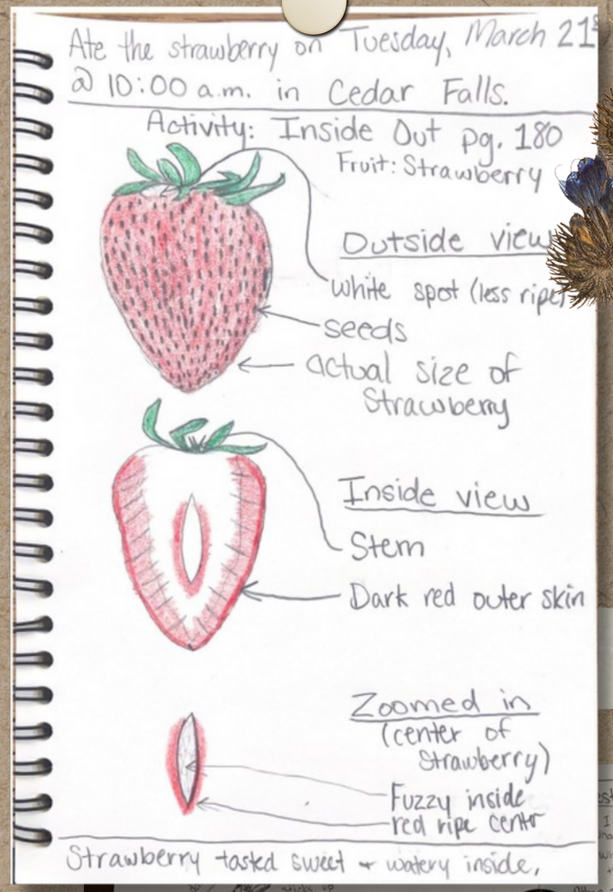


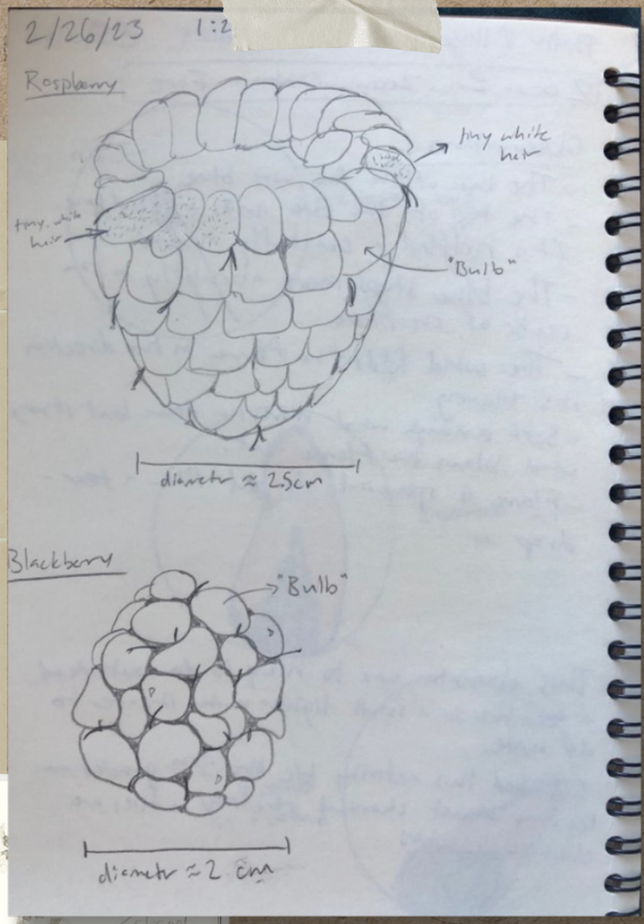


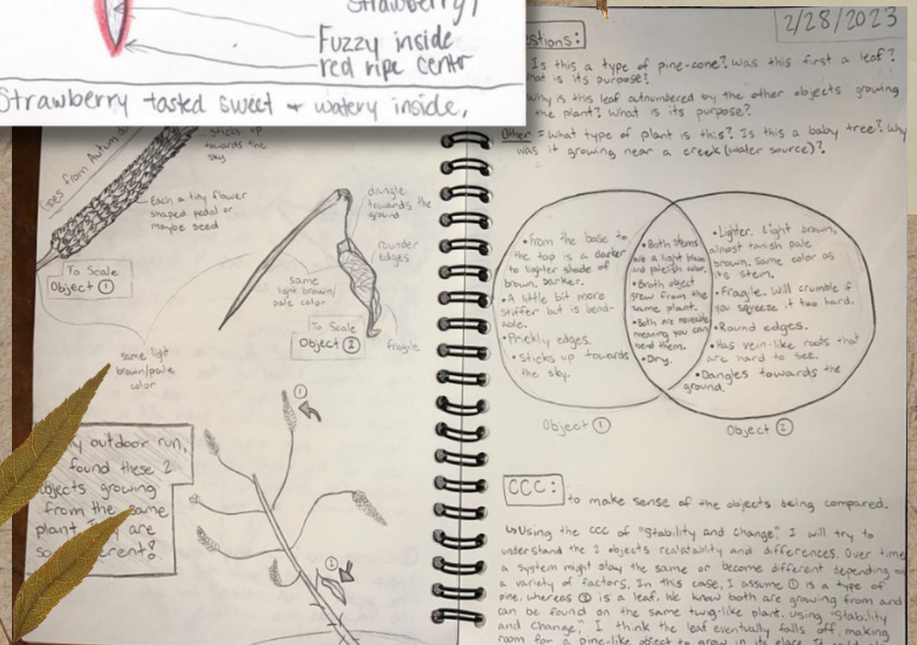


Student Nature Journaling Examples









Why Use Scientific Sketching or Nature Journaling w/ Students?

To encourage close observation and increase learning

To build transferrable thinking skills

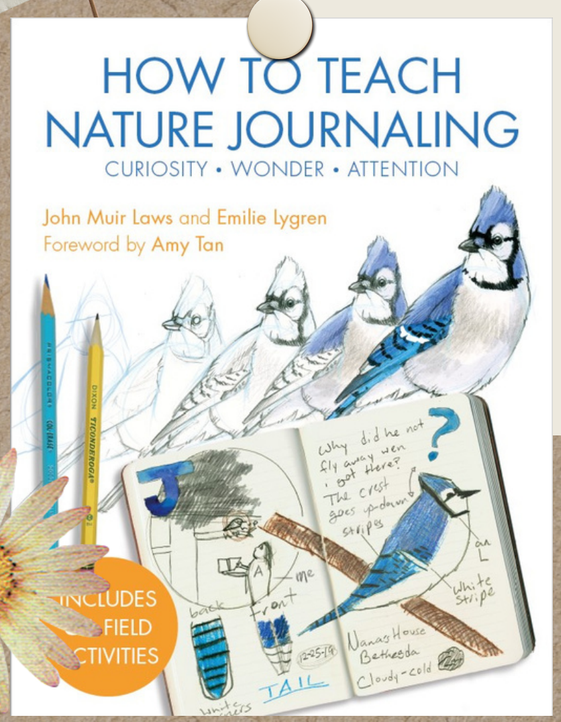
To build scientific skills and thinking

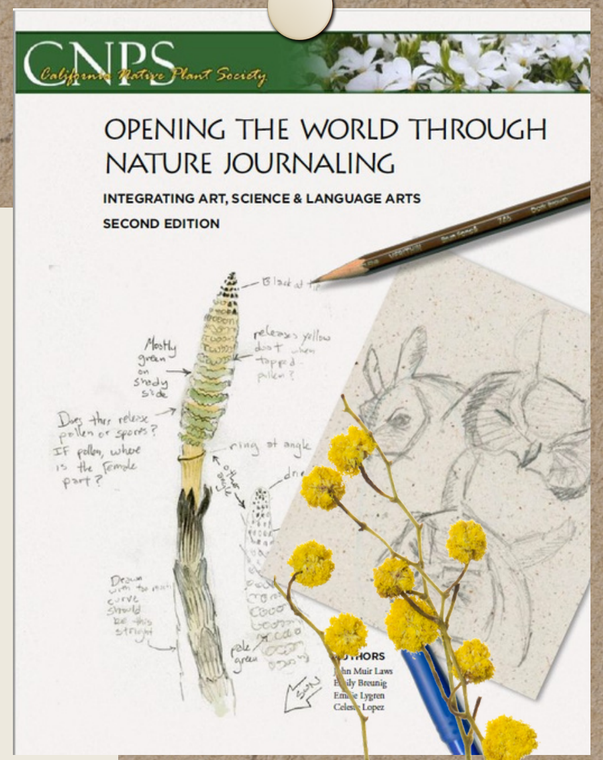
To connect with nature

To practice mindfulness

To experience awe and wonder

Nature Journaling





Pictures

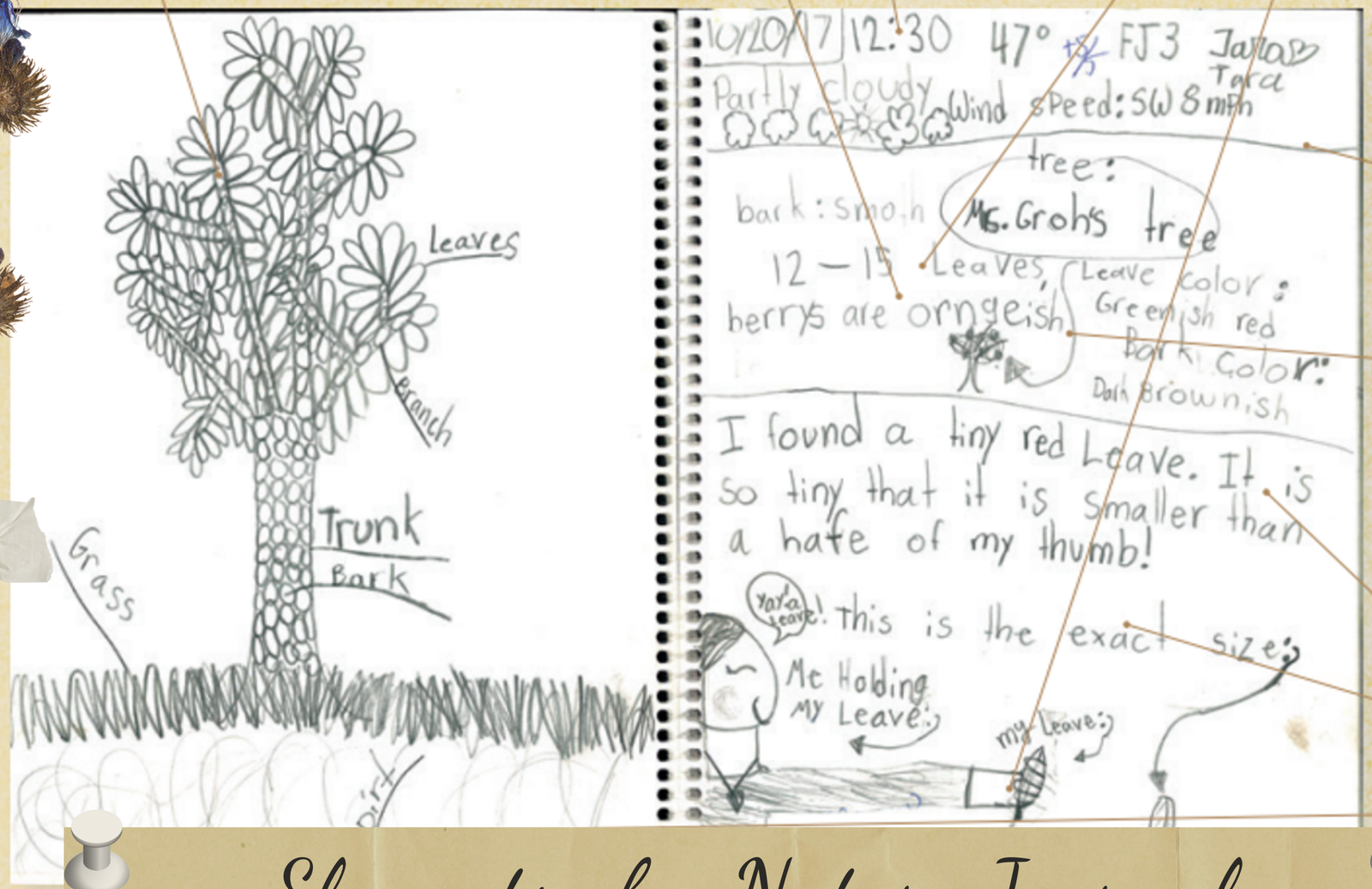
- Icons to show weather
- Drawings at different scales

Observations, Ideas, and Thinking

- Comprehensive metadata
- Notes about colors

Numbers

- Objects are counted
- Scale is shown with relative size



Structure and Layout

- Lines separate the page into sections
- Arrows connect words and text

Words

Observations are recorded in

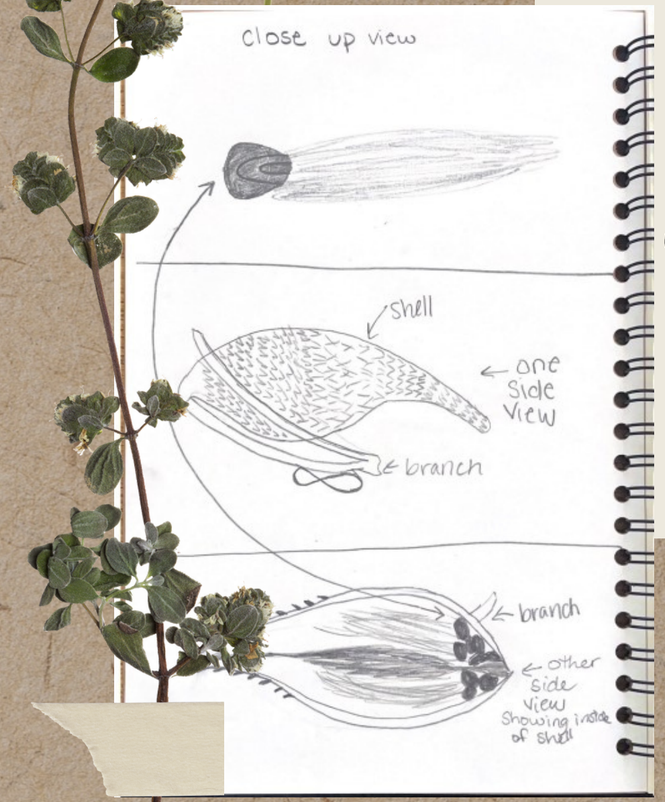
- Full paragraphs
- Short sentences or fragments
- Labels

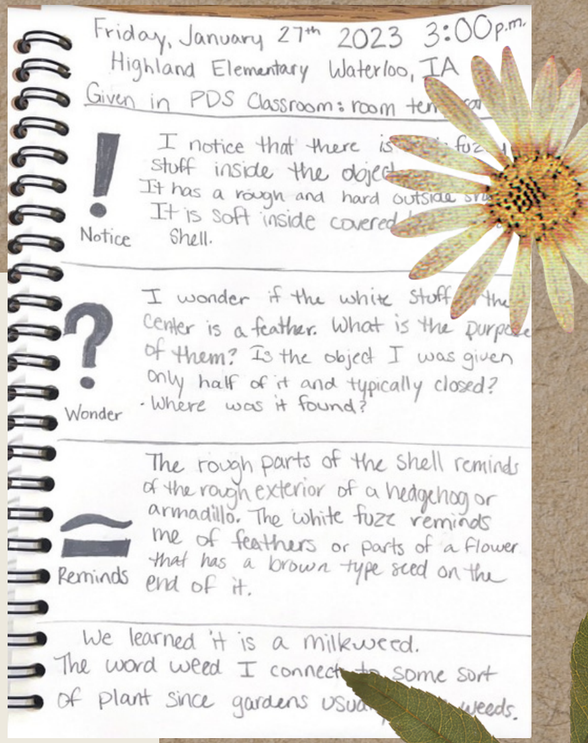
Elements of a Nature Journal

Activity #1:

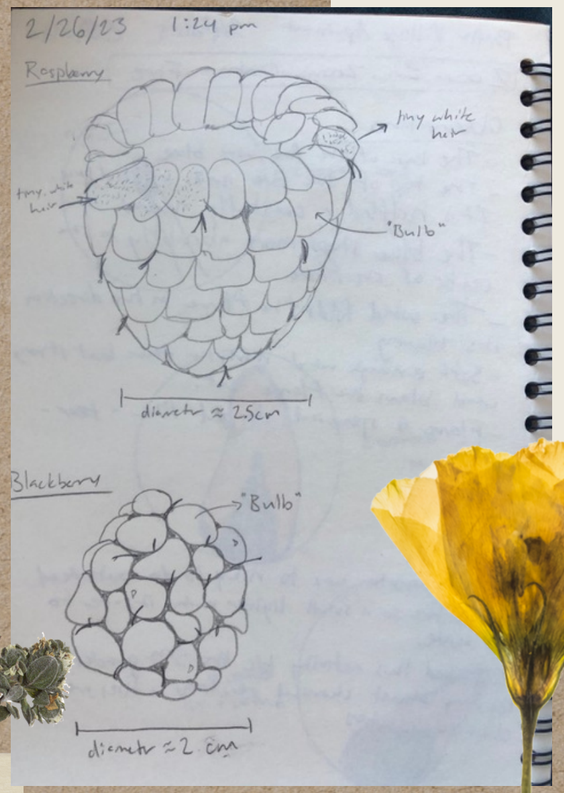
I Notice, I wonder, It Reminds Me Of

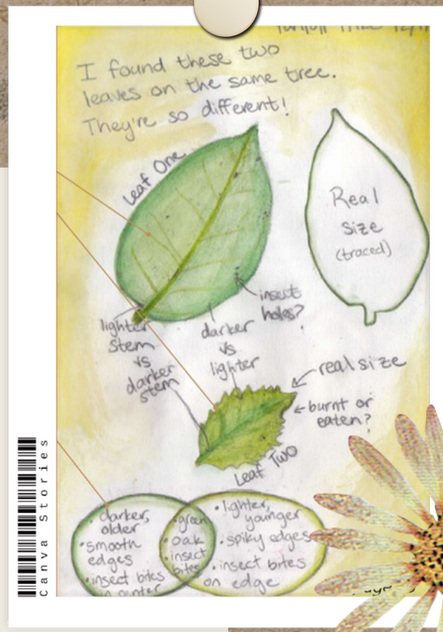
Using the SEPs of Asking Questions and Conducting (a Descriptive) Investigation





Activity #2:
Comparison
Using the Crosscutting Concept of Patterns

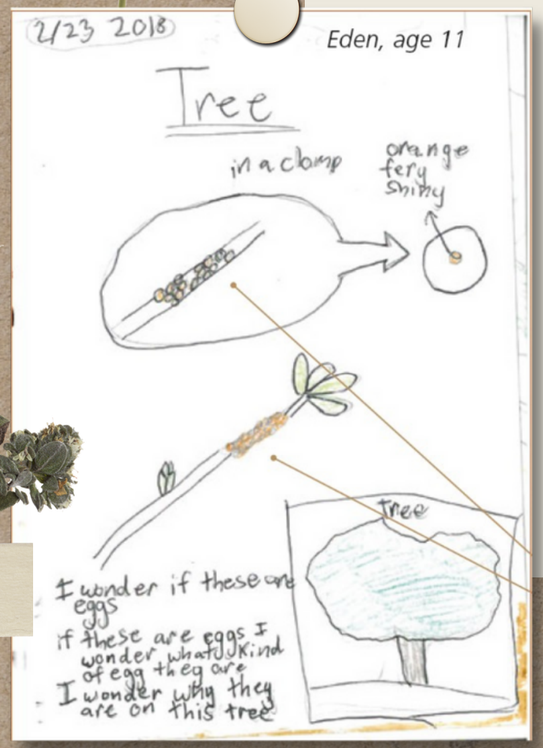




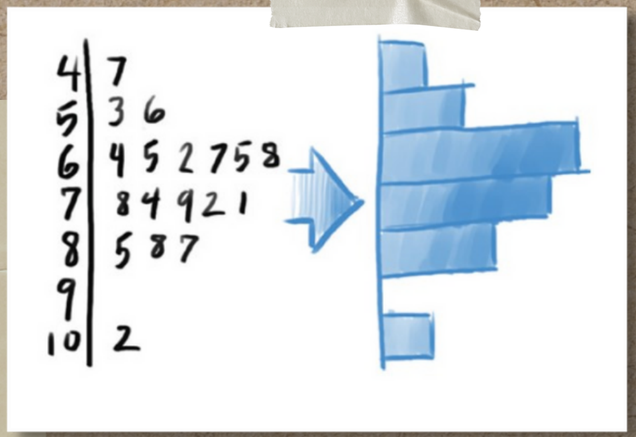
Activity #3:

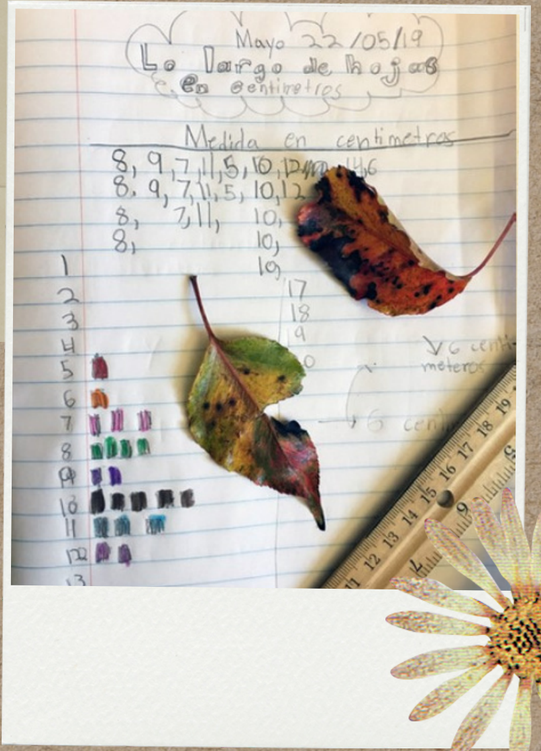
Zoom In, Zoom Out

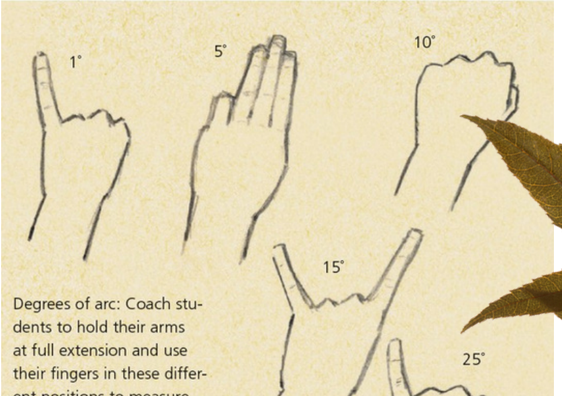
Using the Crosscutting Concept Lens of Structure and Function



Mathematical and Computational Thinking in Nature Journals







Degrees of arc: Coach students to hold their arms at full extension and use their fingers in these different positions to measure

If you and your students find some insects on a leaf, these are examples of the kinds of quantification questions you can ask:

- How many bugs?
- How many instars (age/size classes)?
- How many bugs in each stage of development or life-cycle phase?
- What proportion of the plants in the area are infested with bugs?
- Do you find insect-damaged leaves?
- Can you quantify levels of leaf damage?
- Is there a correlation between number of bugs and leaf damage?
- Can you group the bugs by color?
- How many bugs are in each color class?
- Does color correlate with size?
- Are there more bugs above or below the leaves, at the top or base of the plant, or in the shade or sun?

Then ask why…

FILM NEGATIVE

Self & Peer Assessment

Name: Date:

Circle the required items for this journaling project. Add up the total points possible and put this number at the bottom of the page. Then have a classmate score your sketch and you score their sketch. Check off the required point or points your classmate included. Add up the total points received and put the number on the line at the bottom.

Baseline Data

____Date (1 point)
____Place (1 point)
____Weather/temperature (1 point)
____Time (1 point)

Sketch and Description

____Drawing or diagram (1 point)
____Notes and descriptions (1 point)
____Detail of interesting part (1 point)
____Label parts (1 point or more ____)
____Color or notes about color (1 point)
____Identify object sketched (1 point)
____Habitat sketch (1 point)

Measurements

____Indicate size of object sketched (1 point)
____Indicate parts that are life-sized (1 point)
____If magnified, indicate magnification (1 point)

Other Things to Include

____Connections (1 point)
____Questions (1 point)
____Other-specify (1 point or more ____)

Total points received: _____
Total points possible:

Giving Feedback

DON'T SAY:

"That looks great!"
“That is really pretty.”
“What a good drawing.”
“You are a great artist.”
“That looks so realistic.”
“You are really good at shading.”

DO SAY *(for example)*:

“The way you use both writing and drawing to describe this flower is really clear.”

“I see you measured the distance between the branches and added a scale.”

“Oh, you found a spider on top of the flower! Great observation.”

“The insect damage on that leaf you have illustrated really helps me pick out which flower you were looking at.”

Thank you!

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