

Field experience: Helping science students remotely build insight, connection, and

Welcome! Glad you're here! In a few minutes, you'll need a private place to write, type, or thumb some **notes** and a way to take/draw and share a **picture** through a nearby window. You'll also be **meeting in a small group** - you don't need to have your video on for that, but you certainly can! :) K



Image courtesy of Allison Shelley/The Verbatim Agency for American Education: Images of Teachers and Students in Action

@DrMilks

Field experience: **Helping science students remotely** **build insight, connection, and** **eco-resilience in community**

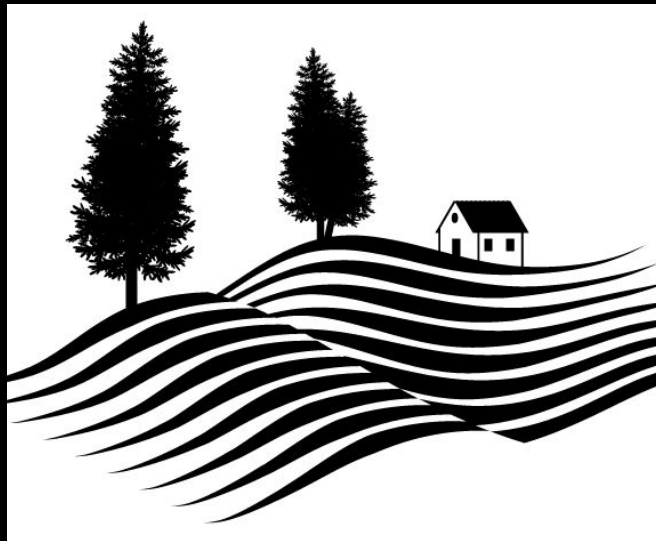
WWTF
STEM conference
June 2020



Kirstin Milks
(she/they)
@DrMilks

Image courtesy of Allison Shelley/The Verbatim Agency for
American Education: Images of Teachers and Students in Action

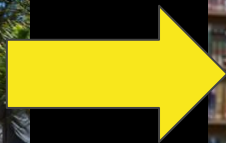
Monthly sit spot assignments tied to science learning and practices



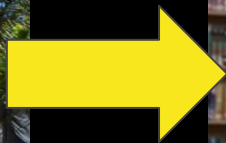
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**Monthly sit spot
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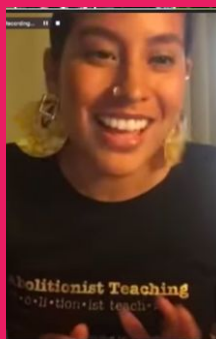
**Monthly sit spot
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**... that can be done remotely
and build anti-oppression
culture in your classroom**

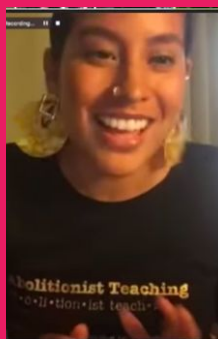




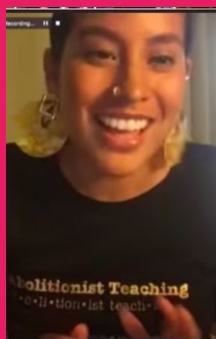
My teachers



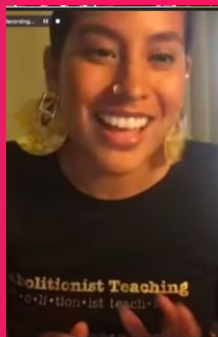
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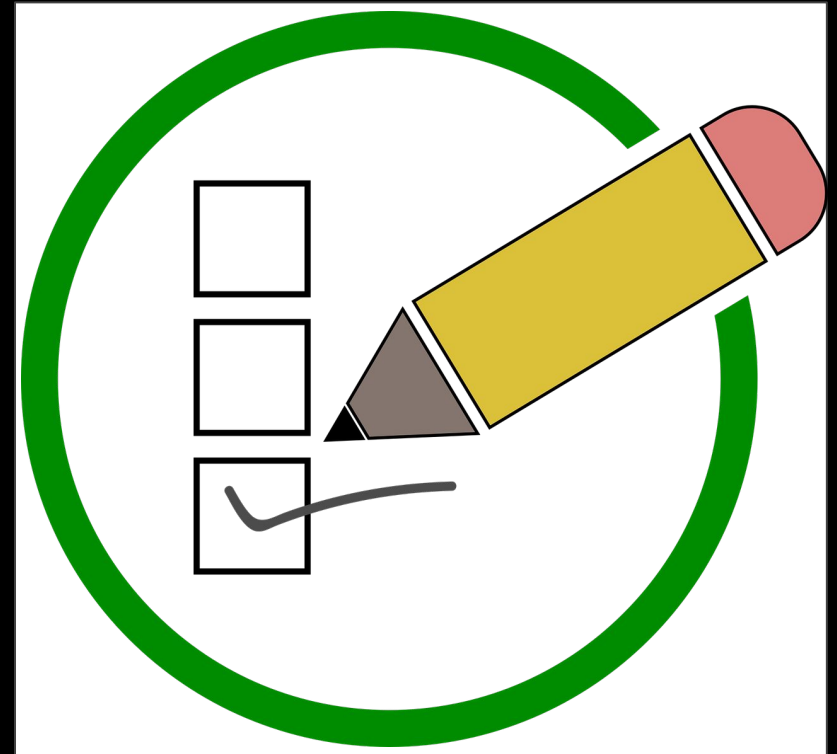


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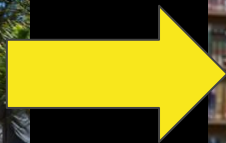


A little about you!

Use the Zoom polls that
pop up to let us know!

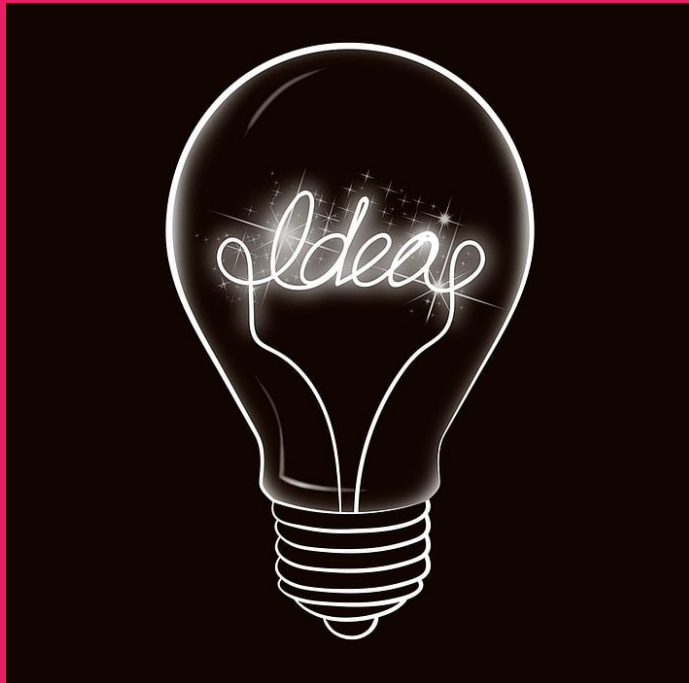


Monthly sit spot assignments tied to science learning and practices



Monthly sit spot
assignments tied to science
learning and practices

3 major ways of generating knowledge:



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1) laboratory experimentation



Yakuzakorat /
CC BY (<https://creativecommons.org/licenses/by/4.0>)

3 major ways of generating knowledge:

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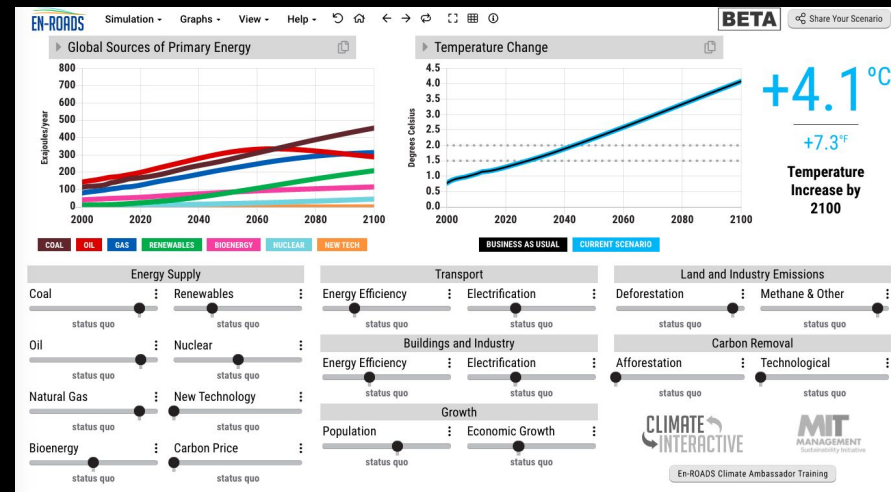
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<https://en-roads.climateinteractive.org/>

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3) field work: collecting/measuring data in – or designing experiments that take place in – an actual ecosystem.

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from *The Watcher* by Jeanette Winter

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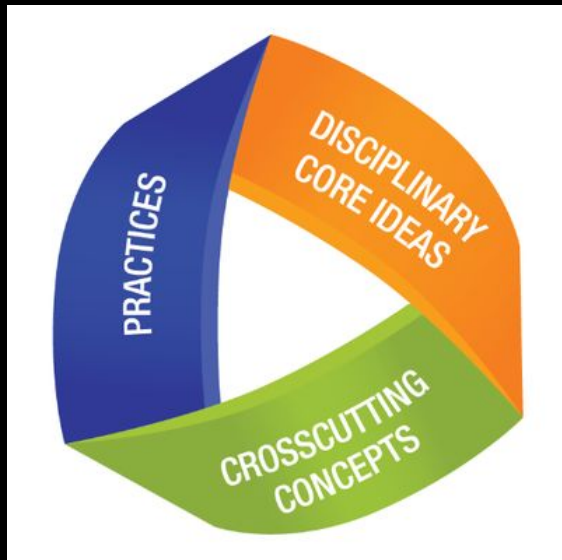


from *The Watcher* by Jeanette Winter



<https://www.noaa.gov/stories/citizen-science-NOAA-ever-dream-of-becoming-scientist-dream-no-more>

Science practices in NGSS



Asking
Questions



Planning and
Carrying Out
Investigations



Analyzing and
Interpreting
Data



Constructing
Explanations

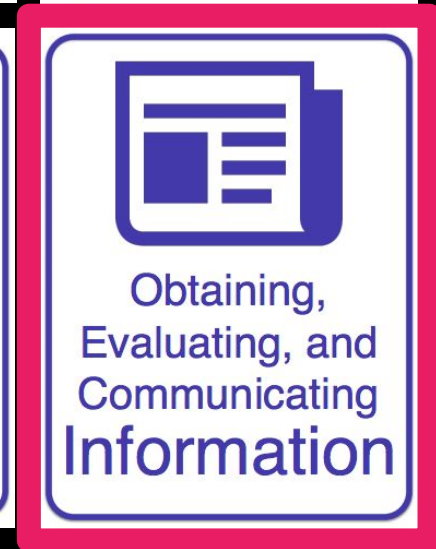
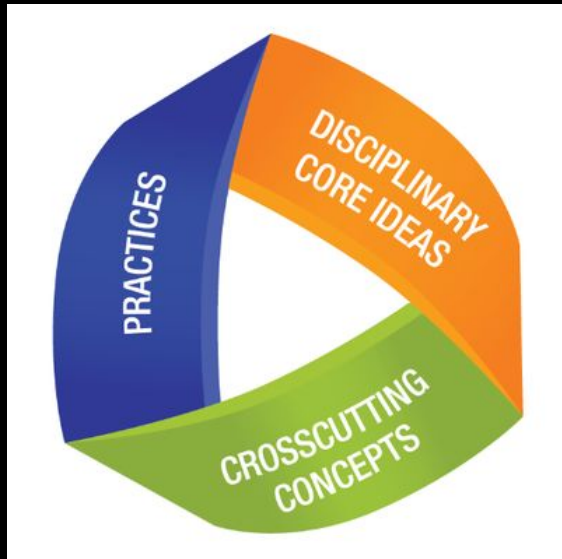


Engaging in
Argument
from Evidence

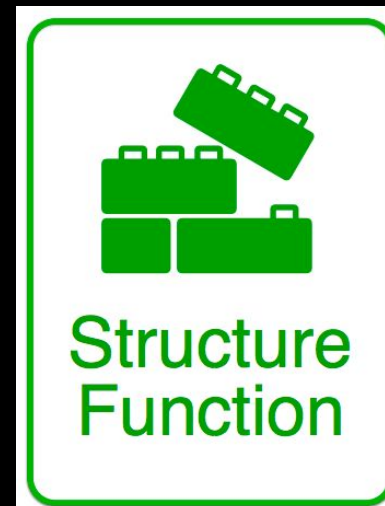
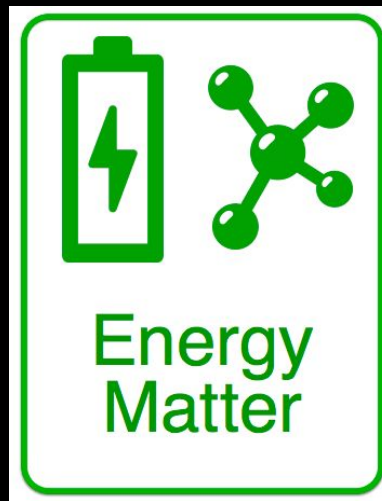
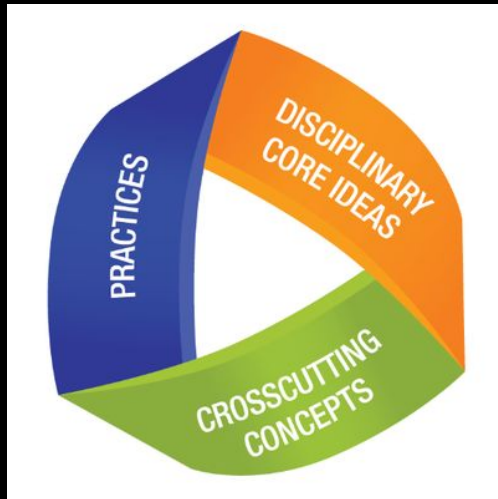


Obtaining,
Evaluating, and
Communicating
Information

Science practices in NGSS



Crosscutting concepts in NGSS

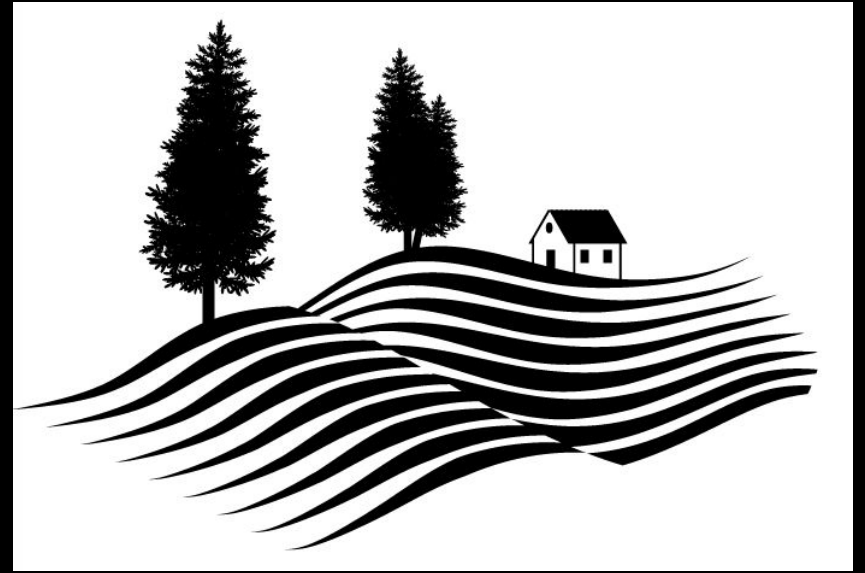


**Observation, systems thinking, argumentation,
and communication are tools of liberation, too.**

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**... that can be done remotely
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Let's look outside!

Today's field experience: Through my window

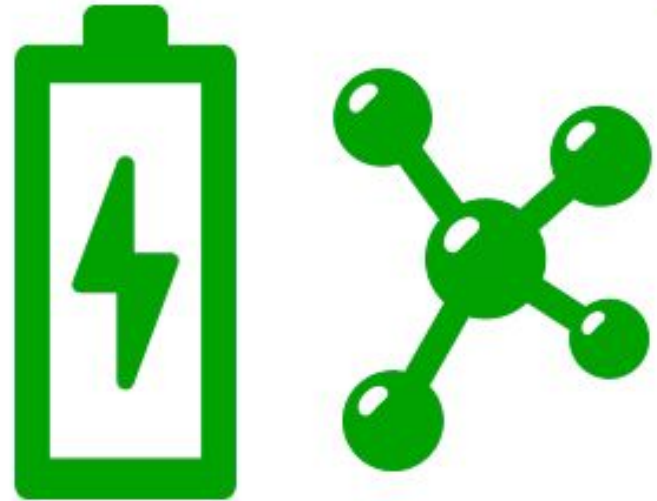


Today's field experience: Through my window



Engaging in
Argument
from Evidence

OR



Energy
Matter



Engaging in
Argument
from Evidence

Journal observations and inferences, side by side.

OBSERVATION

- “What I see — or hear or smell or feel”

INFERENCE

- “What I think it is”
- “What I think it means”
- “Why I think it’s happening”
- “What other data or knowledge I have”

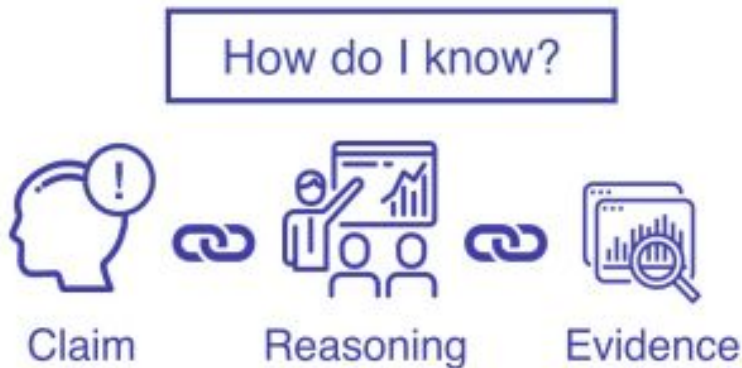
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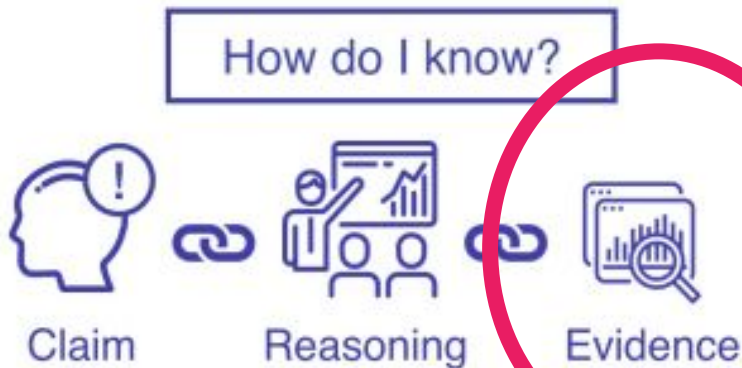
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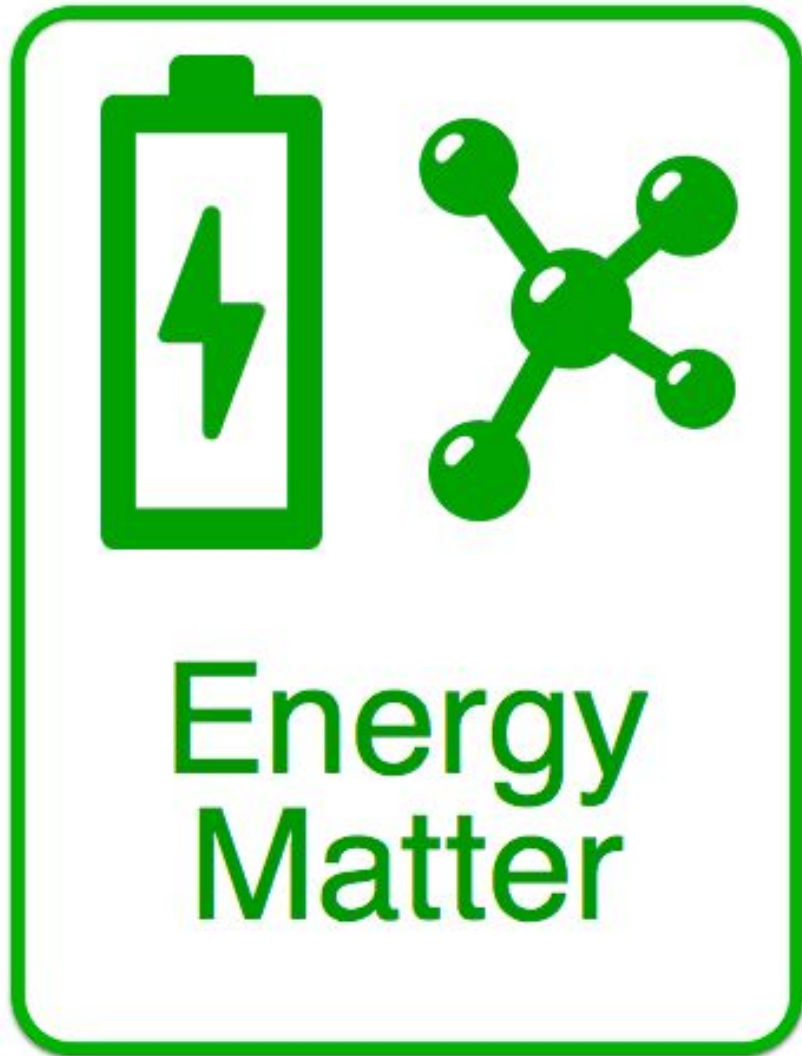
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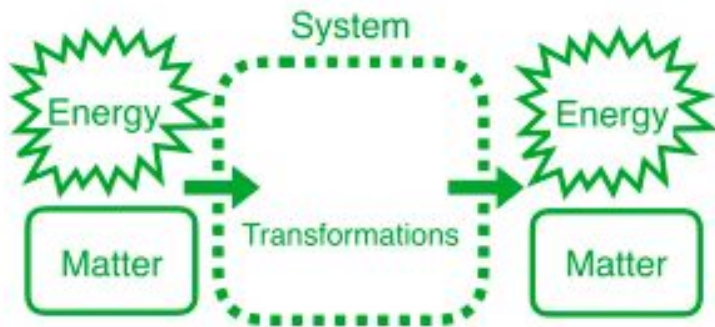
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Matter and energy flow beyond your window:

- What **matter** flows into, out of, and within the place outside your window?
- How does the flow of **energy** (in your place or in our world) drive the movement of matter in your place?



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Tips:

- It is okay not to know -- but value the knowledge you DO have right now.
- We are all in different places.
- Your notes are for YOU -- but be ready to share what you observed / thought / wondered!

Today's field experience: 6 minutes of "Through my window"

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Welcome back!



<https://www.flickr.com/photos/cheesy42/16733482399>

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**... that can be done remotely
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**Who gets to be a
knower in
science?**



INVENTORS OF IU

#IUIINVENTORS



BRAIDING
SWEETGRASS

INDIGENOUS WISDOM, SCIENTIFIC KNOWLEDGE,
and the TEACHINGS of PLANTS

ROBIN WALL KIMMERER



**Who gets to be a
knower in your
science class?**





**SOCIAL JUSTICE
STANDARDS**
THE TEACHING TOLERANCE
ANTI-BIAS FRAMEWORK



Identity



Diversity



Justice



Action

Your turn: sharing your field experience!

Tips:

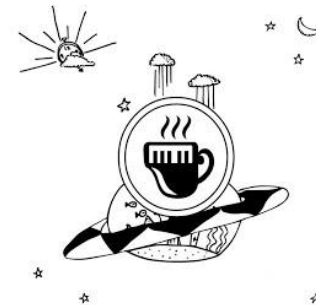
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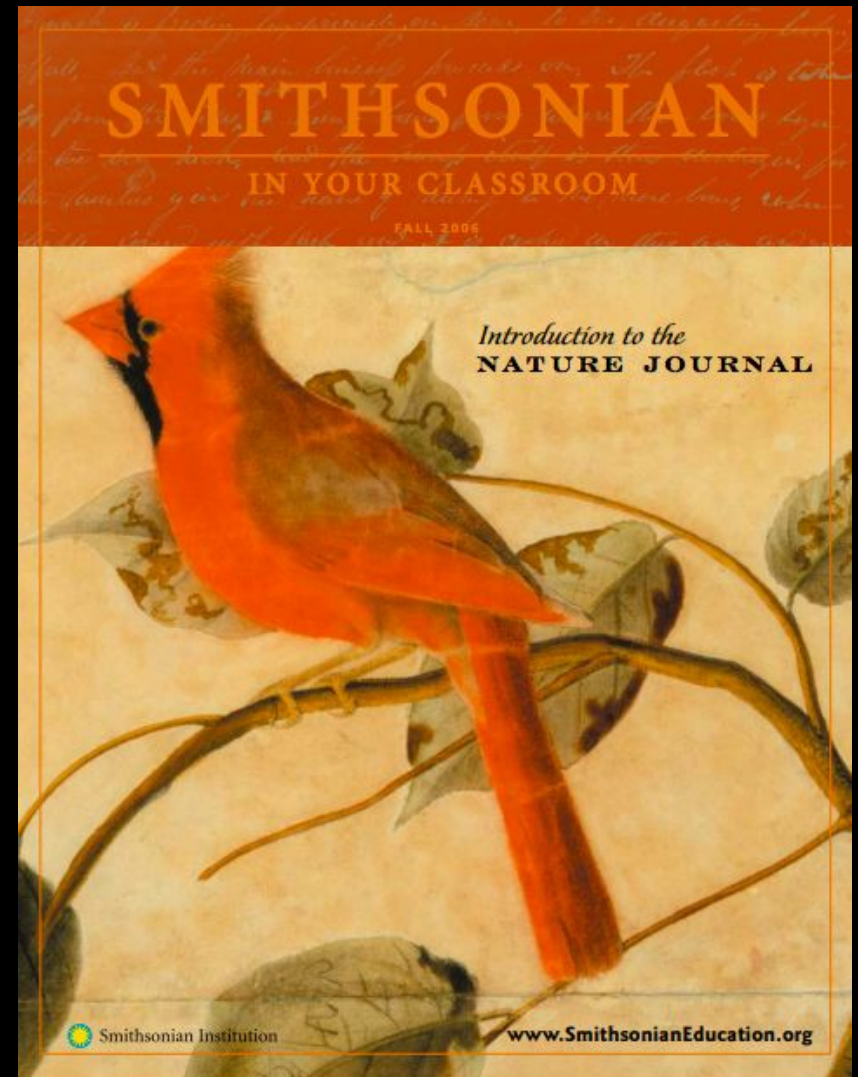


Welcome back!



**What other tasks
can students do
during field site
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http://www.smithsonianeducation.org/educators/lesson_plans/journals/smithsonian_siyc_fall06.pdf

What other tasks can students do during field site experiences?

Phenology:

The study of timing of
life cycle events



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Phenology:

The study of timing of
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What other tasks can students do during field site experiences?

Sketching:

A method for observing

Accurate

This will encourage you to really notice!

BIG

At least $\frac{1}{4}$ of an 8.5" x 11" paper.

Colorful

Label colors.

Detail

Try to capture the richness of what you see.

Explained

Label things you see.

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Collecting:

A method for surveying and moving between scale – and involving others



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What other tasks can students do during field site experiences?

Interviews:

A method to gain
intergenerational
perspective on change



LAND TALK

<https://landtalk.stanford.edu/>



LAND TALK

[conversations](#)[resources](#)[lesson plans](#)[SUBMIT](#)

From cities to farmlands, rivers to bayous, and beaches to mountains, the world around us is constantly changing.

LandTalk is a citizen science and environmental history project that documents through interviews **how local landscapes change over time.**

Its goal is to provide an opportunity for conversations between generations, and a chance to learn from observers about changes they have seen.

[explore the conversations →](#)

What other tasks can students do during field site experiences?

Interviews:

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LAND TALK

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Action



<https://landtalk.stanford.edu/>

Your turn: share a story from being outside



let's talk

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let's talk

Tips:

- Pick a story “in the middle” of importance.
- We are all in different places.
- Be an attentive, present audience.



Your turn: share a story from being outside

2 min

**per
person**

ENJOY BREAKOUT ROOMS!

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- We are all in different places.
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The current AP Bio field experiences:

<https://docs.google.com/document/d/14XtYMHF0iYfd2sENb525UeGzkiOPQNK59mCHILAF2DU/edit>

One last look

Please schedule your site visit for at least 25 minutes by yourself without interruption from devices or people you know.

You may conduct this visit at any time. However, you'll hear and see the most interesting non-human behavior in the early morning, just before or after sunrise, or the early evening, just before or after sunset (...but it is generally much warmer near sunset than sunrise!).

Bring:

- your lab **notebook (or other paper)** and two pens
- your device or another way to take photographs
- wear sunscreen, bug spray, blah blah trust me blah

1. **BEFORE YOU GO OUT:** Look at your (very first) August [Field Experience](#) (this link is to the assignment, not to your work). You need to take the same **THREE** photographs that you did last time, so make sure you have a sense of where those were.

Buddies, the chaos of spring 2020 means you might be at a different site. So be it. Can you take pictures that are similar? Or related in some way? Or, honestly, just three photographs will do.



Now might be a good time to remind you about skunks and snakes. Probably not a wolverine, as shown here, but seriously, animals! *So go slowly and look around* to make sure you aren't, uh, disturbing anyone with a burrow nearby. Or poison ivy, etc.

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Thanks!



tinyurl.com/fieldsites-WWTF