

A vibrant aurora borealis (northern lights) display in shades of green, blue, and purple, set against a dark night sky. The lights are reflected in a body of water in the foreground, and dark, silhouetted mountains are visible in the middle ground. The overall scene is serene and awe-inspiring.

Developing Scientific explanations of phenomena

Participant Handbook

A Framework for K-12 Science Education

Scientific and Engineering Practices

1. Asking questions and defining problems
2. Developing and using models
3. Planning and carrying out investigations
4. Analyzing and interpreting data
5. Using mathematics and computational thinking
6. Constructing explanations and designing solutions
7. Engaging in argument from evidence
8. Obtaining, evaluating, and communicating Information

Identify which practices we use today and reflect on how they were incorporated throughout the day.

A Framework for K-12 Science Education

Crosscutting Concepts

1. Patterns
2. Cause and effect
3. Scale, proportion and quantity
4. Systems and system models
5. Energy and matter
6. Structure and function
7. Stability and change

Identify which crosscutting concepts we use today and reflect on how they were incorporated throughout the day.

A Framework for K-12 Science Education

Disciplinary Core Ideas

Physical Sciences

PS1: Matter and its interactions

PS2: Motion and Stability: Forces and interactions

PS3: Energy

PS4: Waves and their applications in technologies for information transfer

Life Sciences

LS1: From molecules to organisms: structures and processes

LS2: Ecosystems: Interactions, energy, and dynamics

LS3: Heredity: Inheritance and variation of traits

LS: Biological evolution: unity and diversity

Earth and Space Sciences

ESS1: Earth's place in the universe

ESS2: Earth's systems

ESS3: Earth and human activity

Engineering, Technology, and Applications of Science

ETS1: Engineering Design

ETS2: Links among engineering, technology, science, and society

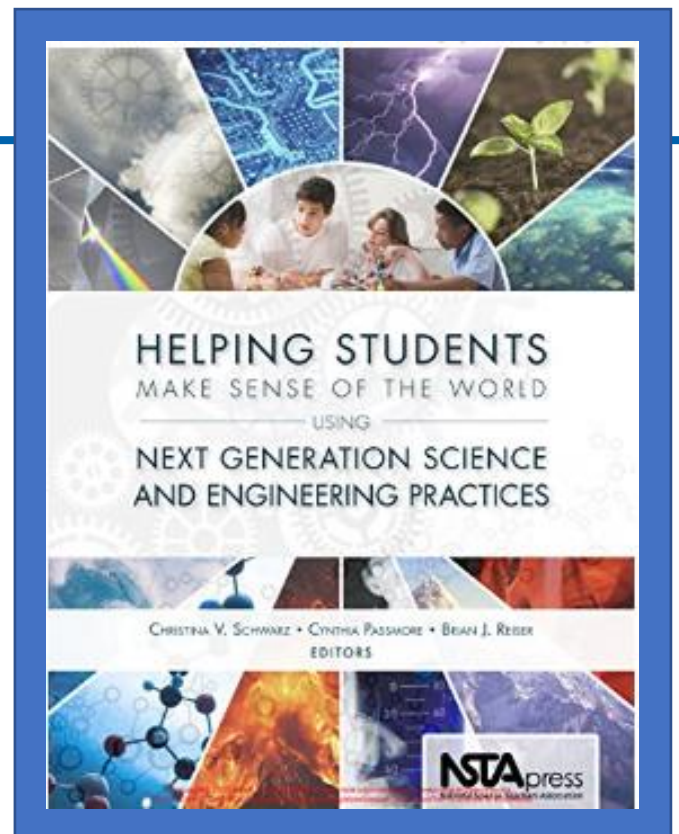
Identify which disciplinary core ideas
we use today and
reflect on how they were
incorporated throughout the day.

Making sense of the world is the fundamental goal of science and should be at the core of what happens in science classrooms.

Read pages 6-7.

What was a thought-provoking idea from the reading?

What “cognitive wiggle” did the reading create?



Discuss your ideas with a partner.



How does this phenomenon connect to big ideas in science education?

Self-Reflection:

Ideas from group discussion:

Constructing Explanations

1

What claim would you expect to see?

Question: What do we want to know?

Claim:
What do we know?

1

Evidence:
How do we know?

2

Reasoning: How can we interpret the evidence?

The evidence shows...

I know...

I can apply...

Therefore, I can conclude that...

3

2

What data and evidence would you expect students to include?

3

What reasoning would you look for?