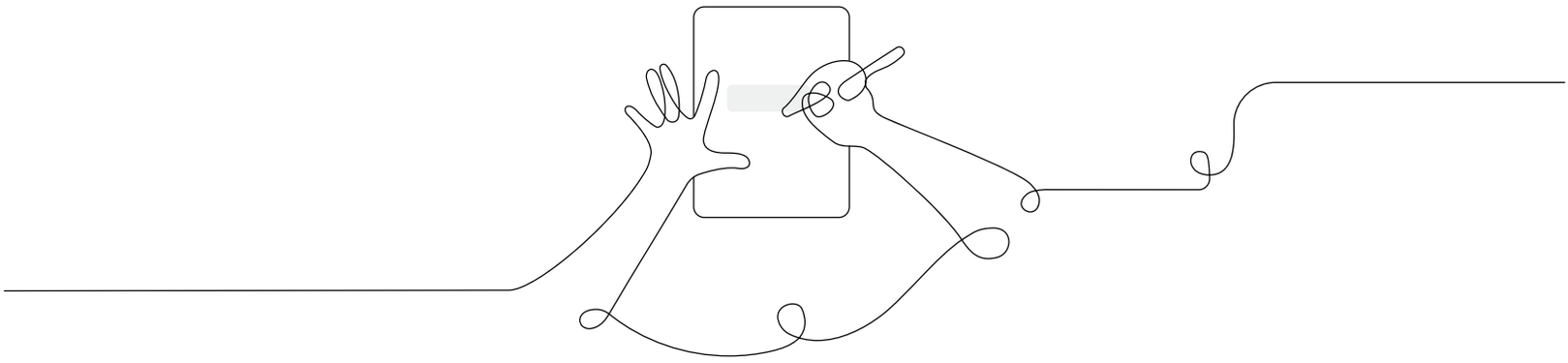
AmplifyScience

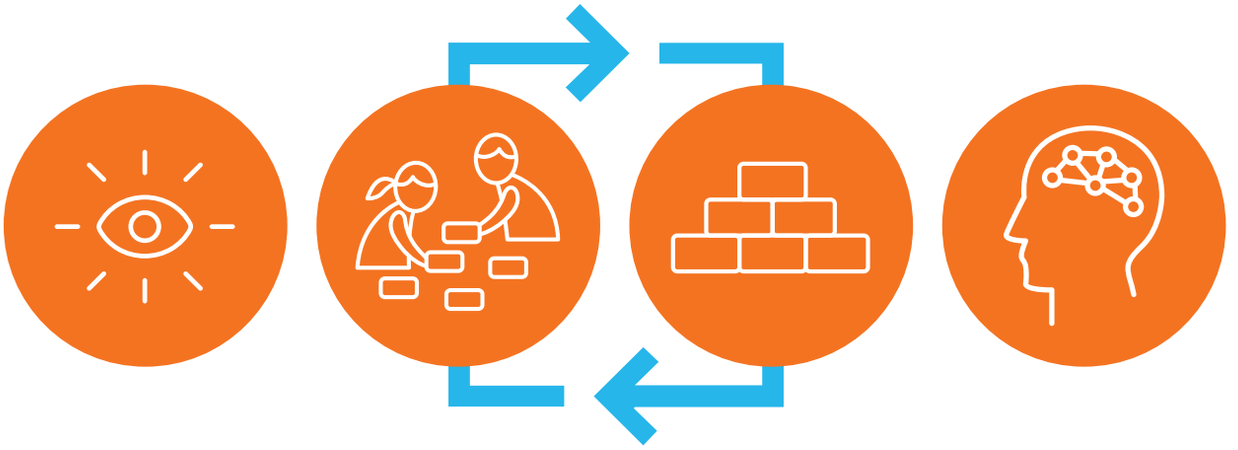
Participant Notebook

Applying Reading and Writing Strategies to Support Claims, Evidence and Reasoning within the Amplify Science Curriculum

Grade 6



Amplify Science approach



Introduce a **phenomenon** and a related problem

Collect **evidence** from multiple sources

Build increasingly complex **explanations**

Apply knowledge to solve a different problem

Three dimensions of NGSS reference

3-D learning engages students in using scientific and engineering practices and applying crosscutting concepts as tools to develop understanding of and solve challenging problems related to disciplinary core ideas.

Science 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**

Disciplinary Core Ideas

Earth and Space Sciences:
ESS1: Earth's Place in the Universe
ESS2: Earth's Systems
ESS3: Earth and Human Activity

Life Sciences:
LS1: From Molecules to Organisms
LS2: Ecosystems
LS3: Heredity
LS4: Biological Evolution

Physical Sciences:
PS1: Matter and its Interactions
PS2: Motion and Stability
PS3: Energy
PS4: Waves and their Applications

Engineering, Technology and the Applications of Science:
ETS1: Engineering Design
ETS2: Links among Engineering Technology, Science and Society

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**

Science Engineering Practices (SEPs)

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

How is literacy embedded in the Amplify Science curriculum?

Exploring an Active Reading Sequence

Directions:

- Navigate to your current unit
- Scroll down to the Unit Guide
- Click Articles in This Unit
- Choose an article
- Fill out this sheet

Unit Title:	Article Title:	
What is the article about?		
First Read		
What is the purpose of this read?	What are students doing as they read? How are they supported?	How does this build on students' unit-level understanding?
Second Read		
What is the purpose of this read?	What are students doing as they read? How are they supported?	How does this build on students' unit-level understanding?
Third Read		
What is the purpose of this read?	What are students doing as they read? How are they supported?	How does this build on students' unit-level understanding?

Analyzing the Purpose of Writing

Unit: _____ Chapter: _____

Directions:

1. Download your unit's Investigation Notebook from Printable Resources in the Unit Guide. Use this to help you identify opportunities for students to write.
2. Analyze the purpose of each writing opportunity in a chapter.
    a. Record the activity and lesson in the first column.
    b. If the purpose of activity is unclear from the Investigation Notebook page, use your Coherence Flowchart, the Lesson Overview Compilation, or navigate to the activity in the Teacher's Guide to learn more about the context.

Activity	**Purpose for the student to write** ● How will the student find this useful?	**Purpose for the teacher** ● How will you find this helpful?

Analyzing the Purpose of Writing, cont.

Activity	**Purpose for the student to write** ● How will the student find this useful?	**Purpose for the teacher** ● How will you find this helpful?

Word bank			
activate argue evidence	explain gather persuade record	reflect remember sense-making	support synthesize thinking understand

Discourse Routines [K-8]

Explanation Language Frames - a gradual release strategy that provides students with a structure to frame their thinking. Ex: Turtles need a _ to survive because_.

Thought Swap - an interactive activity that allows students to practice speaking and listening. Students form two lines facing one another. The teacher poses an open-ended question aligned to the unit/chapter/lesson. The first student responds to the question and the second student repeats what they heard said and then asks a probing/clarifying question. Then the second student adds their thoughts and the first students repeats what they heard them say. Then the students swap partners to respond to another open-ended question or idea.

Think - pair - share (TPS) - is a collaborative learning strategy where students work together to solve a problem or answer a question. This strategy requires students to (1) think individually about a topic or answer to a question; and (2) share ideas with a partner.

Shared Listening - Whole group or small group opportunity for students to listen to someone share ideas or provide an explanation. Shared Listening, similar to Thought Swaps, enlist students to restate (verbally or in writing) what they've heard in order to demonstrate understanding and comprehension.

Partner reading - a cooperative learning strategy to increase comprehension. Partner reading is when students read an assigned text with a partner. The students share the text and take turns reading. They may take turns reading every other sentence, or every other page. The teacher circulates to listen and ask probing questions that enable them to understand student learning.

Science Seminars [6-8] -Typically facilitated in inner-outer circle format, the teacher poses an open-ended question. The questions are designed to elicit multiple perspectives based on the evidence cards sorted in a previous lesson. Students use evidence from multiple sources to support their claim and justify their reasoning, as well as challenge the thinking of others. The teacher is the facilitator and challenges students to evaluate and synthesize their ideas. This discourse opportunity gives students tremendous agency in thinking about content and evidence in order to make convincing oral arguments.

Evidence Circles - sorting activity to match claims, evidence and reasoning, facilitated in whole and small groups. Students use sentence frames and evidence gradients to align evidence that best support their claim.
Word Relationships - a strategy used to help students make connections between concepts based on key characteristics. Routinely making connections gives students the necessary practice with recognizing patterns, identifying relationships, and building upon complex ideas.

Questioning Strategies - In order to engage all learners in the classroom, ensuring everyone has the opportunity to participate in discussions and do the important thinking when a question is posed, teachers use a variety of questioning strategies along Bloom's Taxonomy. Questions are pre-planned prior to the lesson and specifically aligned to the learning objectives and differentiated student needs.

Completed Scientific Argumentation Wall Diagram

Scientific Argumentation

1.3

The purpose of a scientific argument is to convince others, using evidence and reasoning.

1.3

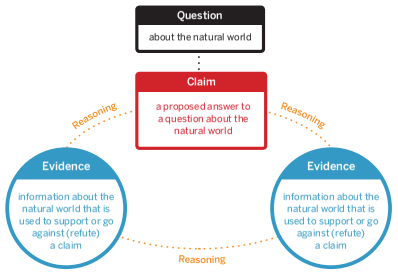
Evaluating Evidence

1.3

Evidence can support or go against a claim.

1.3

Scientific Argument



1.3

Reasoning Tool

Evidence	This matters because . . . (How does this evidence support the claim?)	Therefore, . . . (claim)

3.3

Evidence Gradient

3.1

Example Student Arguments

3.4

A scientific argument . . .

- begins with a question.
- has a claim that proposes an answer to the question.
- has evidence that supports the claim.
- clearly explains how the evidence supports the claim (reasoning).

1.3

Argumentation Sentence Starters

- I think this evidence supports this claim because . . .
- I don't think this evidence supports this claim because . . .
- I agree because . . .
- I disagree because . . .
- Why do you think that?

1.3

Name: _____ Date: _____

Writing a Scientific Argument

Write your scientific argument to the Carson Wilderness Education Center below. As you write remember to:

- Include your strongest, most convincing evidence.
- Use the Scientific Argument Sentence Starters and the Word Bank in Part 2 to help you explain your thinking.

How was Carson Wilderness Education Center destroyed?

- **Claim 1:** The Carson Wilderness Education Center was damaged by one very severe rainstorm.
- **Claim 2:** The Carson Wilderness Education Center was damaged by several moderate rainstorms that happened throughout the month.

Part 1: Before you write your argument supporting Claim 1 or Claim 2, you will need to explain to the people at the Carson Wilderness Education Center what causes a rainstorm. Use the space below to write them an explanation.

- Be sure to tell them about all the factors that can cause a rainstorm (remember, they are not experts in meteorology).
- You will use information from the Evidence Cards to write your argument about what happened to the Carson Wilderness Education Center in Part 2.

Part 2: Write a scientific argument that addresses the question: *How was the Carson Wilderness Education Center damaged?*

- First, state your claim. You may choose to use one of the two claims given in Part 1, or you can create your own.
- Then, use information from your Evidence from May Data Table or the Evidence Cards to support your claim.
- You may want to refer to your writing in Part 1 to help explain why your evidence supports the claim.

Word Bank

air parcel	cloud	condensation	energy	evaporation
temperature	troposphere	water vapor	wind	

Scientific Argument Sentence Starters

Describing evidence:	**Explaining how the evidence supports the claim:**
The evidence that supports my claim is . . . My first piece of evidence is . . . Another piece of evidence is . . . This evidence shows that . . .	If ____, then . . . This change caused . . . This is important because . . . Since, . . . Based on the evidence, I conclude that . . . This claim is stronger because . . .

Notes