

STAC



**SCIENCE & TECHNOLOGY
ADVANCEMENT CENTER**

**Constructing Explanations and Scientific Argumentation
(CER) With AI as a Reasoning Partner**

NSTA AI in Education Pathway

April 2026

Chris Lazzaro, Ph.D., Velma Itamura

About Us

The *Science & Technology Advancement Center (STAC)*, is a nonprofit organization that works with states, districts, and companies to design, develop and implement high quality science programs. We focus on integrating new and emerging technologies in classroom settings to support 3-dimensional learning.

Chris Lazzaro
Executive Director



Velma Itamura
Operations
Director



Session Goals

- Protect Productive Struggle: AI in the supportive role
- Increasing student curiosity by engaging students with AI
- Focus on student critical thinking skills

AI should support SEP-rich work

AI is strongest as a questioning and feedback partner

Students still need to explain, compare, revise, and defend ideas themselves

**The goal is
scientific
thinking.**

What Research Currently Suggests



Independent transfer is less certain



Scaffolded use is more promising than answer-giving use



Productive struggle is important throughout the learning process

Two very different ways AI shows up in class

AI as answer machine

- Give me the lab conclusion.
- What claim can I make?
- What is the evidence of this phenomena?
- Summarize photosynthesis.

AI as reasoning scaffold

- Ask me questions that help me improve my claim.
- Critique my evidence and identify possible misconceptions that I should explore further.
- Compare two student models and identify which better explains the data.

Use AI to Practice Critique and Critical Thinking skills

- Students analyze an AI-generated explanation for scientific accuracy
- Students identify where the model overgeneralizes, omits evidence, or confuses correlation and causation
- Students revise the response and justify each revision

Activity: Using AI as a Thinking Partner

This activity helps students strengthen scientific reasoning by using AI to question their ideas rather than answer for them. It supports deeper sensemaking by prompting students to examine evidence, notice assumptions, revise explanations, and build stronger understanding through reflection and critique.

Activity: Using AI as a Thinking Partner



Activity: Using AI as a Thinking Partner Debrief

- What part of the activity most pushed your thinking beyond your first explanation?
- Which AI question was most effective in helping you revise or strengthen your reasoning?
- How did this experience feel different from using AI to get an answer?
- What made the AI function as a thought partner rather than an answer source?

Activity: Using AI as a Thinking Partner Debrief

- When did you realize the phenomenon was more complex than your initial explanation suggested?
- What did this activity show you about why scientific explanations often need revision, qualification, or multiple interacting causes?
- In what ways did the AI's questions invite you to keep wondering instead of settling too quickly on an answer?

Thank you!

Chris Lazzaro

clazzaro@stac-vernier.org

Velma Itamura

vitamura@stac-vernier.org

Tool Agnostic. Ready to Use.



STAC