



STAC

**SCIENCE & TECHNOLOGY
ADVANCEMENT CENTER**

AI for Scientific Modeling: Helping Students Refine, Compare, and Critique Models

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



Why Scientific Modeling Matters

Scientific models help students:

- Explain observable phenomena
- Represent systems, relationships, and processes
- Test ideas and revise thinking with evidence
- Communicate claims and reasoning

Common challenge:

- Many students can create an initial model, but they struggle to:
 - Revise models meaningfully
 - Compare multiple models
 - Identify gaps or misconceptions
 - Justify changes with evidence



AI can Make Student Thinking Visible

AI can support scientific modeling by generating:

- Initial draft models
- Incomplete models
- Models with embedded misconceptions
- Multiple versions that vary in accuracy or detail
- Alternative representations of the same phenomenon

Students can use AI-generated models to:

- Compare ideas
- Spot errors or missing components
- Revise explanations
- Defend improvements using evidence
- Engage in deeper scientific sensemaking



What This Looks Like in Practice

Example classroom flow:

- Students investigate a phenomenon
- Students develop an initial model
- Teacher introduces 2–3 AI-generated models
- Students compare the models for strengths and weaknesses
- Students identify misconceptions, omissions, and unsupported claims
- Students revise their own model using evidence from the investigation
- Students justify revisions in writing or discussion

The goal is not “Which AI answer is right?”

The goal is “How do we use evidence to evaluate and improve explanations?”

Critique and Revision

- What do you notice in this model?
- What do you wonder about it?
- What should be revised, and why?
- Which model is better supported by evidence?
- What idea in this model is inaccurate or incomplete?
- What evidence challenges it?
- How should the model change?



Refine the Model





Thank you!

Chris Lazzaro

clazzaro@stac-vernier.org

Velma Itamura

vitamura@stac-vernier.org

NSTA Survey Session 10

