



STAC

**SCIENCE & TECHNOLOGY
ADVANCEMENT CENTER**

From Policing to Purpose:

Designing AI-Resilient Science Tasks That Surface Student Thinking

NSTA AI in Education Pathway

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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.

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By the End of the Session

You will be able to:

- identify why some science tasks are vulnerable to AI shortcutting
- explain what makes a task AI-resilient
- use a simple framework to redesign tasks so student reasoning is visible
- apply practical strategies that strengthen sensemaking during phenomenon-based investigations

Leadership for AI-enabled science learning starts with communication, support, and purposeful design.

What AI Can and Cannot Do Reliably

AI can:

- generate plausible explanations
- summarize information
- suggest patterns, variables, or possible mechanisms
- produce polished language quickly

AI cannot reliably:

- determine whether an explanation is supported by evidence
- apply science ideas with full conceptual coherence
- recognize flawed assumptions or incomplete models
- engage in investigation, argumentation, or true model revision on its own

AI can generate scientific language. Students still need to generate understanding.

AI Exposes the Task Design Problem

If AI can complete the task without human reasoning, the task is vulnerable by design.

Common signs:

- product over process
- fluency over evidence
- answer-getting over sensemaking
- no visible reasoning

From Policing to Purpose

The goal is not to prove who used AI.

The goal is to design tasks where student reasoning is indispensable.

- sensemaking over answer-getting
- visible thinking over polished products
- design over enforcement

Why This Approach Matters for Learning

Deep learning requires more than fluent answers.

Students still need:
productive struggle
human interaction
evidence-based reasoning
opportunities to revise and defend ideas

AI-resilient tasks protect those conditions.

What Makes a Task AI-Resilient

A task is more AI-resilient when it requires:

- critique over retrieval
- evidence-driven reasoning
- visible thinking during the process
- revision, justification, or defense of ideas
- AI to function as an imperfect contributor, not an authority

AI Resilient Task Rubric



Your Turn: Evaluate a Task

As a group, choose one science task from your table's curriculum and revise it by asking:

- Task Goal
- Role of AI
- Protection of Productive Struggle
- Visibility of Student Thinking
- SEP Alignment
- Equity

Final Takeaway

The goal is not to police AI.

The goal is to design science tasks where student thinking remains necessary, visible, and central.

AI-resilient tasks:

- reveal reasoning
- strengthen sensemaking
- protect productive struggle
- use the SEPs to focus the learning

**Tool Agnostic. Ready
to Use.**





Thank you!

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