

T. Garcia Science Lesson Plan Series

Order of Lessons

1. Unseen by the Machine: When People and Rocks Are Misread
 2. Voices in the Stone - Science Meets Culture
 3. Teaching the Machine - Classifying Rocks with AI

Instructional Considerations

Academic Supports

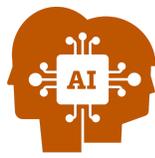
- Provide sentence stems or scaffolding with leading questions.
- Strategic pairing
- Vocabulary cards with visuals/examples
- Allow student choice and input in final assessment
 - Alternative solutions: video, social media post, animation, game

Behavioral/Engagement Support

- Assign team roles and rotate frequently to ensure all students contribute
 - Allow student choice if possible
- Use timed rotations when possible to maintain movement and focus
 - Consider breaks after so many stations or time
- Provide optional challenge prompts for finishers
 - Ex: *“Predict which samples will confuse the AI the most and why.”*
- Provide questions before discussions to allow students time to engage
 - Allow students the choice to skip one *or more* questions if called on.
- Gallery walk at the end is a great way to allow students to show ownership and pride in their work
- Provide cue cards with steps outlined of what is expected during each stage

Additional Resources/Background Information:

- [Document folder on Google Drive](#)
- [Overview of Dr. Joy Buolamwini](#)
- [Algorithmic Justice League](#)



- **Voices in the Stone**
 - Digital Presentation - [Canva](#); [Slides](#); [Powerpoint](#); [PDF](#)
 - [Table](#)
 - Reference sheets(2)
 - [Australian Museum Rock Classification Guide](#)
 - [Nevada Bureau of Mines and Geology Rock Key](#)
- **Teach the Machine: From Outcrop to Output**
 - [Teachable Machine by Google](#) - A beginner-friendly tool where students can train a basic AI model using images, sounds, or poses. This could be used as a follow-up or extension to explore how AI "learns" from data.
 - [Teachable Machine Tutorial](#) - Part 1 of a 3 part series from Google on how to use Teachable Machine.
 - [Sample Training Data](#)
 - An idea of what could be used. Be sure to talk about ethics, data acquisition and consistency for data training. These are of various quality from a google image search. Keep these from year to year. More data is ALWAYS better.
- **The Rock Turing Test**
 - Possible [Data Table](#) for testing known images
- **Assessment**
 - [Potential grading rubric](#)

Time Management:

- Clearly post timing for each station or use a visual timer during rotations.
- Use a visual or auditory signal to keep transitions smooth
- Build in time to troubleshoot for tech issues or discussions that go longer than expected
- Decide in advance if you will run the capstone project as a gallery-walk or short presentations.
- Provide checkpoints for students during the training/testing phase and capstone project.

Prior Knowledge & Skills:

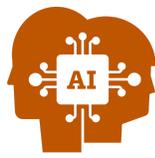
- Physical test methods for geologic samples (streak, carbonate (fizz), luster, magnetism, scratch)
 - Moh's Hardness scale - A quick demonstration/overview would be sufficient
- Ethics/AI Literacy: Introduce key terms early so they can be used naturally in discussion

Differentiation & Accessibility:

- Provide sentence stems for students who need additional scaffolding with written responses
- For students with IEP/504 accommodations: offer small-group support during exploration and consider pairing with peers during the think-pair-share and groupwork phases.

Technology Access:

- Ensure all students can access digital tools



- Ensure all students can work with ZIP files and understand file management or access to a shared file system.
- Provide printed datasets or simulate AI prompts for classrooms with limited devices or restricted AI tool access.
- For students who might need support consider recording a gif/video of the process to share.

Classroom Logistics:

- Organize students into intentional small groups to balance confidence levels and peer support.
- If doing stations:
 - Clean navigable pathways
 - Materials for testing (streak plates, acid droppers, magnifying glasses, glass, penny, nail, etc)
 - Safety equipment (goggles, aprons if students choose, eyewash station/safety shower)
 - First aid kit

Equity & AI Ethics:

- Facilitate thoughtful conversations around how biased or incomplete data can affect real-world decisions made by AI.
- Encourage students to critically evaluate who is impacted when data is missing, skewed, or overly generalized.
- Stress that AI is a tool, not an authority; humans must remain responsible for how AI is interpreted.
- Ensure multiple entry points for participation (oral, writing, drawings)

Optional Extension ideas:

- Exploration #3: Auditing Bias & Fixing Fault Lines
 - Have students go back and choose one of the faults of their model and work to correct it. They would then go through the testing phase again, record changes and later display it as a comparison in the capstone project
- Have students set up a confusion matrix using a set of labeled images they did not test the Teachable Machine on.