

7th Grade Science STEAM Integration

Unit 3: Rock Transformations

Topic: Engineering Design

Time: 2 Days

Standards:

[MS-ESS2-1](#) Develop a model to describe the cycling of Earth's materials & the flow of energy that drives this process.

[MS-ESS2-2](#) Construct an explanation based on evidence for how geoscience processes have changed Earth's surface at varying time and spatial scales

[MS-ESS3-1](#) Construct a scientific explanation based on evidence for how the uneven distributions of Earth's mineral, energy, and groundwater resources are the result of past and current geoscience processes.

Scenario

You've been hired by the National Geology Museum to design a hands-on, physical model that shows how rocks form, transform, and cycle over time. Your model should demonstrate the processes of weathering, erosion, deposition, compaction, cementation, heat, and pressure.

Success Criteria

I can design and build a model that demonstrates the physical processes of the rock cycle and explains how rocks change over time.

Lesson Outline

Day 1: Design and Build

1. Hook (5 min):
 - Watch a quick animation of the rock cycle.
 - Ask: *What forces cause rocks to transform?*
2. Design Challenge Intro (10 min):
 - Teams must model at least 3 transformations (e.g., sedimentary to metamorphic to igneous).
 - Available materials: crayons, clay, aluminum foil, sand, heat sources (hair dryers or warm water), pressure (books or weights).
3. Brainstorm and Sketch (10 min):
 - Groups plan their process pathway.
4. Build Phase 1 (20 min):
 - Create sediment → sedimentary rock (pressure), simulate metamorphism (heat + pressure), simulate melting and cooling.

Day 2: Demonstrate and Explain

1. Complete Builds & Refine (20 min):
 - Test and refine models to clearly show rock transformations.
2. Presentation (20 min):
 - Groups walk through their rock cycle, explaining each process.
3. Exit Reflection (5 min):
 - What part of the cycle was easiest/hardest to model?



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Resources

