

# Lesson 2: Exploring Chemistry and Earth Science

## *Using the National Geographic STEM Science Kit*

This lesson plan uses the **National Geographic STEM Science Kit** to explore real-world chemical reactions, crystal formation, and geology concepts through hands-on experiments.

### Learning Objectives

- Understand basic chemical reactions (volcano eruption and crystal formation).
- Observe and record changes in matter during experiments.
- Explore how heat, saturation, and minerals affect crystal growth.
- Learn to follow procedures, collect data, and reflect on results.

### Preparation & Setup

- 1 Read the included guide to select 2–3 experiments for your lesson.
- 2 Set up a clean, flat surface (tray or old newspaper).
- 3 Have timer, measuring cup, notebook, and camera ready.
- 4 Discuss variables — what changes and what stays constant.

### Activity Plan

- 1 **1. Volcano Reaction:** Combine baking soda and vinegar in the provided model. Observe fizzing, bubbling, and gas production.
- 2 **2. Crystal Growth:** Mix and pour the crystal solution. Observe over several days, recording color and shape changes.
- 3 **3. Gem Dig:** Excavate gemstones from the block and identify them with the included chart.
- 4 **4. Discussion:** Compare fast vs. slow reactions. What factors affected results?

### Reflection Questions

- What did you notice about the speed of different reactions?
- Why do vinegar and baking soda react so quickly?
- How could you make crystals grow larger?
- How are real volcanoes similar to your experiment?

### Extensions & Cross-Subject Links

- Math: Graph crystal growth over 5 days.
- Language Arts: Write a short lab report using full sentences.
- Geography: Locate major volcanoes or crystal mines on a map.

- Art: Sketch your crystal or volcano in detail.

## Parent & Teacher Tips

- Always supervise chemical reactions.
- Encourage predictions before each experiment.
- Use magnifying glasses to observe textures.
- Emphasize patience and careful observation.

*Created for MommySchool Tools — Homeschool Science Series*

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