

Volcano Islands

Collaborative Clay: S.T.E.A.M.

Best suited for elementary/middle school students.

Duration: 2 90-minute sessions, or 1 90-minute session and 2 45-minute sessions

Learning Goal(s): Students will use different handbuilding techniques to construct an ecosystem (volcano island). After the project is complete, students will explore chemical reactions.

Learning Objective(s): Students will combine multiple handbuilding techniques into one clay project; paint a 3-D project using acrylic paint; use their knowledge of chemical reactions to test what happens when combining baking soda and vinegar.



Big Question(s): (1) What is an ecosystem? What components must every ecosystem have? How do those components relate to each other? (2) What handbuilding techniques can be used to create a small landscape with clay? (3) What are alternative ways to finish a ceramic piece besides using glaze?

Skills/Necessary Demos: Session 1 - slab construction, coil building, making pinch pots, slipping and scoring (scratching and attaching); Session 2 - painting, volcano eruption (baking soda + vinegar)

Ceramic Terms ([Claymobile Vocabulary Terms](#)):

- Clay
- Ceramics
- Slip and Score (scratch-and-attach)
- Slab
- Coil
- Pinch Pot
- Cold Finish
- Bisque Fire (bisqueware)

Other Related Terms:

- **Volcano** - a mountain or hill, typically conical, having a crater or vent through which lava, rock fragments, hot vapor, and gas erupt from the earth's crust
- **Island** - a piece of land surrounded by water
- **Ecosystem** - a biological community of interacting organisms and their physical environment
- **Landscape** - (in art) natural scenery such as mountains, valleys, trees, rivers, and forests arranged in a composition
- **Chemical Reaction** - a process that leads to the chemical transformation of one set of chemical substances to another

Variations/Modifications:

- **Warm Up Activity:** Student can brainstorm different animals, plants, and objects they might find on a deserted island and consider their roles on the island as a whole. Who is the predator? Who is the prey? What is the shelter? What are the decomposers?
- Instead of having students work on individual islands, they can work together in groups to make a larger group volcano island.
- There are several options for finishing the project: (1) painting with acrylic paint after bisque firing (i.e. cold finish); (2) glazing with either underglaze and clear glaze, or colored gloss glazes; or, (3) underglazing during the first session and leaving the projects unglazed (i.e. once-fire).

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Variations/Modifications continued:

- Projects can be decorated with mixed media materials such as fabric, sand, glitter, yarn, flocking, etc.
- Project can be extended into multiple session by allowing the components to dry before attaching.
- Project can be adjusted to any kind of landscape: jungle, coral reef, desert, arctic, etc. Project can also be an imaginative exercise by having students create imaginary landscapes, like alien stations in space, fantasy underwater cities, or Jurassic Park.

Cultural/Artistic References:

- [Information on Cold Finishes](#) from Artist and Educator, Shawna N.M. Barnes
- [Information on baking soda and vinegar volcanoes](#) from Science Kids
- [YouTube video](#) of a similar paper mache volcano project from Red Ted Art
- Another [variation on a clay volcano](#) from The Spruce Crafts
- Article: [Plants & Animals Around Volcanoes](#) from Sciencing
- Article: [Equation for the Reaction Between Baking Soda and Vinegar](#) from Thought Co.

Session 1 Materials:	Session 2 Materials:
<ul style="list-style-type: none"> • Clay • Scoring tool (or fork) • Needle tool (or skewer) • Wareboards (or cardboard) • Slip (or water) 	<ul style="list-style-type: none"> • Acrylic paint • Paint brushes • Smocks or aprons (acrylic paint is not washable) • Baking soda • Vinegar dyed with red food coloring • Container to catch the “eruption” (plastic tray, shallow box, etc.)

Construction Process:

Session 1 (90 minutes)

	ACTIVITY	STEPS	DISCUSSION POINTS
1	Make the base	<ol style="list-style-type: none"> 1. Form a slab from a piece of clay. 2. Lightly draw out the shape of the island using a needle tool. 3. Once the shape is drawn, cut it out using the needle tool. 4. Place the base onto a wareboard and set aside the scrap pieces of clay. 	<ul style="list-style-type: none"> • Slab should be about $\frac{1}{3}$ inch thick, or no thinner than a finger. • If a student makes a mistake while drawing out the initial shape, they can erase it and start over by wiping it away with their finger.
2	Map out the island	<ol style="list-style-type: none"> 1. Use the needle tool to lightly sketch out what will go on the island and where it will be located. 	<ul style="list-style-type: none"> • Drawings do not need to be detailed here since they will be covered up, they just need to map out locations.
3	Make the island features	<ol style="list-style-type: none"> 1. Use slabs, coils, and pinch pots to construct the different components of the island. <ul style="list-style-type: none"> • Solid shapes (leaves, boats) can be cut out of slabs • Linear shapes (tree trunks, snakes) can be made from coils • Solid shapes (boulders, turtles) can be made from pinch pots • Large shapes (volcano, hut) can be made by combining techniques (i.e. coiling up a volcano, laying slabs on top of a pinch pot for a hut, etc.) 	<ul style="list-style-type: none"> • Students can also use a needle tool to carve details into the shapes they make.

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4	Connect all the features to the island	<ol style="list-style-type: none"> 1. Arrange all loose components on the island base. 2. Once everything is in place, start to connect each piece to the base one at a time by slipping and scoring where the two clay pieces will be connected. 3. Gently connect each piece and smooth any rough edges and visible scratches. 	<ul style="list-style-type: none"> • Remind students that pieces will fall off the base after firing if they are not slipped and scored. • If a student has an object made from a face-down pinch pot (like a boulder) they should poke a hole through the slab where it is connected to allow air to escape during firing. Air trapped inside, like a balloon, may explode during firing. • Rough edges may be sharp after firing.
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Collect all projects and fire them in the kiln.

**Construction Process:
Session 2 (90 minutes or 2 45-minute sessions)**

	ACTIVITY	STEPS	DISCUSSION POINTS
1	Cold-finish	<ol style="list-style-type: none"> 1. Paint bisque-fired pieces with acrylic paint. 	<ul style="list-style-type: none"> • <i>Modification/Variation: Student can also glaze these pieces and fire them again before erupting.</i> • This second session can be broken into two shorter sessions instead of painting and erupting on the same day.
2	Erupt the volcanoes!	<ol style="list-style-type: none"> 2. Once the paint is dry (acrylic paint will dry quickly, especially on the bisque surface), place the finished volcano inside a shallow container. 3. Sprinkle a spoonful of baking soda into the volcano. 4. Pour red-dyed vinegar into the volcano. 	<ul style="list-style-type: none"> • Students are witnessing a chemical reaction between an acid (vinegar or acetic acid) and base (baking soda or sodium bicarbonate). $\text{NaHCO}_3 + \text{CH}_3\text{COOH} \rightarrow \text{CO}_2 + \text{H}_2\text{O} + \text{Na}^+ + \text{CH}_3\text{COO}^-$

Collect all projects and fire them in the kiln.

National Core Art Standards:

Creating - Conceiving and developing new artistic ideas and work.

Anchor Standard #1. Generate and conceptualize artistic ideas and work.

Anchor Standard #2. Organize and develop artistic ideas and work.

Anchor Standard #3. Refine and complete artistic work.

Presenting - Interpreting and sharing artistic work

Anchor Standard #4. Analyze, interpret, and select artistic work for presentation.

Anchor Standard #5. Develop and refine artistic work for presentation.

Anchor Standard #6. Convey meaning through the presentation of artistic work.

Connecting - Relating artistic ideas and work with meaning and external context

Anchor Standard #10. Synthesize and relate knowledge and personal experiences to make art.

Anchor Standard #11. Relate artistic ideas and works with societal, cultural and historical context to deepen understanding.

Pennsylvania Standards for the Arts and Humanities:

9.1. Production, Performance and Exhibition of Dance, Music, Theatre and Visual Arts

A. Know and use the elements and principles of each art form to create works in the arts and humanities.

B. Recognize, know, use, and demonstrate a variety of appropriate arts elements and principles to produce, review and revise original works in the arts.

C. Know and use fundamental vocabulary within each of the arts forms.

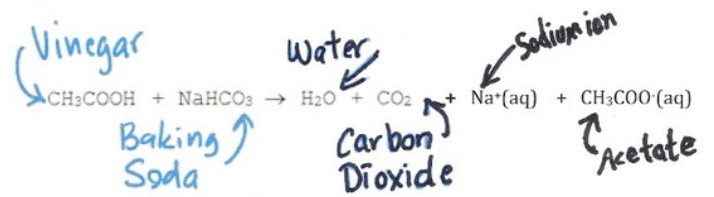
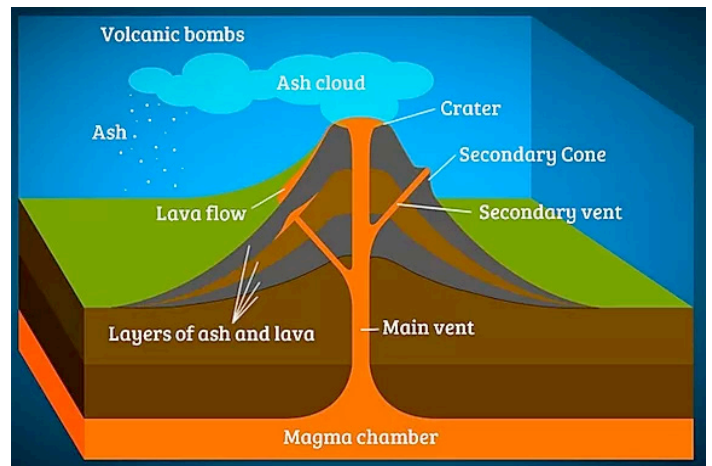
D. Describe and use knowledge of a specific style within each art form through a performance or exhibition of a unique work.

J. Apply traditional and contemporary technologies for producing, performing, and exhibiting works in the arts or the works of others.

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Image Resources



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