

Archaeological Site Formation — in — Miniature

Jessica A. Badner, Mollie S. Toll, and OAS Staff

You will need:

<i>15-20 gallon aquarium (doesn't need to hold water)</i>	<i>Very small seeds (such as poppy or mustard)</i>
<i>1 color of sand or dirt – lots, 2+ gallons</i>	<i>Dryer lint</i>
<i>4 different colors and sizes of sand – 1+ quart each</i>	<i>Spray bottle with water (rain)</i>
<i>Ash (fireplace or barbeque or volcanic) – 1 pint</i>	<i>Sieve for “dusting” dirt into the aquarium</i>
<i>Small charcoal chunks</i>	<i>Length of tubing or straws for blowing dirt around</i>
<i>Lots of small sticks (long but narrow, cut to length)</i>	<i>Tooth picks</i>
<i>Small pebbles and rocks (less than one-half inch)</i>	<i>Spoons, small and large (for excavation)</i>
<i>2-3 small pieces of sandstone (2 inches square)</i>	<i>Small paint brushes for excavation</i>
<i>Small bones (no bigger than chicken wing bones)</i>	<i>Clippers or sturdy scissors for cutting sticks</i>
<i>Large egg shell fragments (to represent pots)</i>	

Students will build a miniature landscape and archaeological site in an aquarium, creating a visual representation of geological strata and site formation processes over time. Strata are visible through the sides of the aquarium.

Students will learn that site formation is complicated; that sequences can be different in different places; that natural and cultural processes can deposit, move, and remove evidence; and that different events can have different visibility in the archaeological record.

Start with a thick layer of dirt (from the 2+ gallon supply) on the bottom of the aquarium, at least 2 inches. To keep students engaged, this exercise works best with only 5 students per aquarium, but having multiple aquaria creates all kinds of possibilities for different landscapes and sequences.

Print or photocopy the list of geomorphic and cultural events. Cut the paper into strips, give one or more “events” to each student, and have the students execute each event in sequence order. Often groups won’t get beyond 15-20 steps, and you can make your own shorter or longer script of things to do as you and your students discover what is fun and what works best with your dirt. Different groups can have different scripts and then trade places before excavating into the finished aquaria.

Archaeological Site Formation

— *in* —

Miniature

SETTING THE STAGE:

- 1) Sculpt and press the top of the thick first layer of dirt into a landscape surface, somewhere between flat and undulating. It rains! Spray down the entire landscape until the dirt surface is just damp.
- 2) A volcano erupts downwind, a volcanic ash cloud blows over the area, and a thin layer of ash is deposited all over the landscape (use the sieve to scatter the ash relatively evenly).
- 3) 500 years pass, and more dirt is deposited over the landscape (about one-quarter inch). It rains! Spray down the entire landscape until the dirt surface is just damp.
- 4) A drainage cuts through the area...dig out a shallow arroyo with the spoon, removing the dirt from the aquarium
- 5) 500 years pass, and more dirt (a different color than before) is deposited over the landscape. It rains! Spray down the entire landscape until the dirt surface is just damp.
- 6) Another layer of dirt...and it rains! Spray down the entire landscape until the dirt surface is just damp.

HUNTERS AND GATHERERS:

- 7) A small group of hunter-gatherers passing through the area and decide to stay for a few days. Build the frame for a small tipi (sticks pressed into the dirt just enough to hold their position), about 3 inches around at the base. Arrange some of the larger pebbles around the base of the tipi as if to hold down the hide cover.
- 8) The group digs a roasting pit for game (such as deer or rabbit). Dig a small pit (2 inch diameter, one-half inch deep) away from the tipi, just moving the dirt aside. Line the hole with small stones and gravel, add some small charcoal and ash, add some bones, then cover with small stones and push the dirt back over the top of the pit.
- 9) Place the sandstone down where you can work around it as if it were a grinding stone (metate). Dribble some of the small seeds over and around the grinding stone. Tamp the earth down around the grinding stone as if people had been standing and working around it.
- 10) Serve dinner: open (dig out) the roasting pit, pushing dirt and gravel and charcoal aside to retrieve the bones. Toss the bones away as trash somewhere around the tipi and metate.

Archaeological Site Formation

— in —

Miniature

11) It's time to move! Pick up the tipi sticks but leave everything else. Make it rain until everything is damp!

12) Time passes ... scatter a thin layer of dirt over everything. Another volcano erupts ... scatter a thin layer of ash over everything. Use the airline tubing to blow the ash around a little. Make it rain until everything is damp!

13) More time passes...scatter another layer of dirt over everything and make it rain.

A FARMING FAMILY MOVES IN:

14) A farming family arrives and decides to stay over the winter. They dig a circular pit house, but build it against the wall of the aquarium so that you can see inside. It should be a little larger than the tipi and an inch or more deep. Move the dirt to one side, it will be needed for the roof. Tamp down the pit house floor into a flat surface, and dig a little hearth in the center of the floor. Put some charcoal and ash into the hearth. Set a pot (egg shell) on the floor of the pit house.

15) Make a roof framework over the pit using sticks. Cover with the dryer lint (brush and grasses) and then cover it all with the dirt from the hole, leaving a hole in the center of the roof (an entry and smoke hole).

16) Pick a spot for an outdoor kitchen, "discover" the piece of sandstone left by the hunter-gatherers for grinding seeds, move it to where you want it, and tamp down the dirt around the work area. Scatter some seeds, and tamp down the dirt again. Set a pot (egg shell) on the surface of the kitchen work area.

17) Build another roasting pit near the kitchen. Dig a small hole (2 inch diameter, one-half inch deep), just moving the dirt aside. Line the hole with small stones and gravel, add some small charcoal and ash, add some bones, then cover with small stones and push the dirt back over the top of the pit.

18) Dig up dinner from the roasting pit, toss the bones aside, and then roast another dinner in the pit (notice how it's getting messy around the pit).

19) Dig a storage pit (2 inches diameter, and an inch deep), line it with lint, and fill it with seeds. Cover with lint and dirt.

20) A generation has passed, and it's time to move (by now it's sort of stinky with all of the garbage around the house)! The sticks that hold up the roof of the pit house are valuable, so take

Archaeological Site Formation

— in —

Miniature

them with you. As you pull out the sticks, the lint and dirt should fall into the pit house hole (you can watch through the side of the aquarium). Crush the pots, both inside the pit house and in the kitchen area. Open the storage pit and recover most of the seeds, taking them with you as well.

21) Time passes...scatter a layer of dirt over everything. Make it rain until everything is damp!

22) More time passes...scatter more dirt, blow some of it around, tamp it down lightly, scatter more dirt, and make it rain.

23) Repeat the dirt accumulation process until the old features are difficult to see, making it rain so that the dirt is damp.

ANOTHER FARMING FAMILY MOVES IN:

24) Another family arrives and decides to stay over the winter. They dig another pit house as if they don't know where the first pit house was (the new pit house doesn't have to be against the wall of the aquarium). If you overlap with the earlier pit house, you may have to be clever to make the new house work without the walls or roof collapsing. You can reinforce a weak pit house wall with sticks, mud, or stones. Build a small hearth, and add a pot or two to the floor.

25) Make a cribbed roof framework over the pit using sticks. Cover with the dryer lint (brush and grasses) and then cover it all with the dirt from the hole, leaving a hole in the center of the roof (ladder entry and smoke hole).

26) Pick a spot for an outdoor kitchen. If the piece of sandstone is visible, "discover" it and move it to where you want it. If the sandstone isn't visible, get a new piece, put it where you want it, and tamp down the dirt around the work area. Add a pot or two. Scatter some seeds, and tamp down the dirt again. Crush a pot and scatter the sherds around.

27) Dig another roasting pit, fill it, empty it, and toss the bones aside.

28) It's time to move! The sticks that hold up the roof of the pit house are valuable, so take them with you. As you pull out the sticks, the lint and dirt should fall into the pit house hole. Be sure that the pot gets crushed.

29) Time passes ... scatter a thin layer of dirt over everything. Make it rain until everything is damp!

Archaeological Site Formation

— in —

Miniature

30) More time passes...scatter more dirt, blow some of it around, tamp it down lightly, scatter more dirt, and make it rain.

31) Another volcano erupts!

32) Repeat the dirt accumulation process until the old features are difficult to see.

HUNTER-GATHERERS RETURN:

33) Another small group of hunter-gatherers passing through the area decides to stay for a few days. Build the frame for a small tipi (sticks pressed into the dirt just enough to hold their position), about 3 inches around at the base. Arrange some of the larger pebbles around the base of the tipi as if to hold down the hide cover.

34) Set up another metate and dig another roasting pit, use it, and toss the bones away.

35) It's time to move! Pick up the tipi sticks but leave everything else. Make it rain until everything is damp!

36) Time passes...scatter a thin layer of dirt over everything. Make it rain until everything is damp.

37) Repeat until only the top halves of the tipi ring rocks are visible.

HERE COMES THE HIGHWAY DEPARTMENT:

38) Put a line of toothpicks along the length of the aquarium, marking the edge of a highway that will be built through the aquarium

39) What does an archaeologist see on the surface that would reveal the presence of a site?

40) Carefully remove the dirt along one side of the highway stakes with the spoon and brushes. Try to leave a clean vertical profile of the unexcavated dirt. What do you find in the dirt? Can you reconstruct what features go with the different occupations? What can you tell from looking at the profile and the features exposed in the profile? Can you write a story from just what you saw while digging up half the aquarium and looking at the profile?