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Fossil Making Lab

S.T.E.M. ON A SHOE STRING

By Brad Fulton
Educator of the Year, 2005
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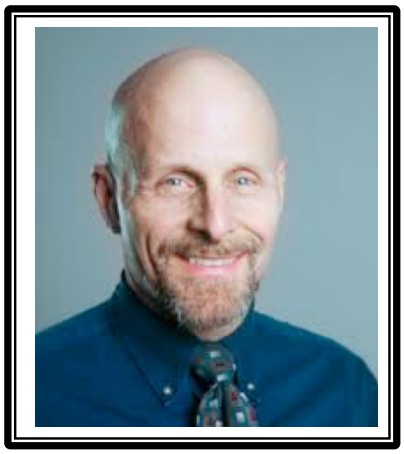
Brad Fulton

Educator of the Year



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- ♦ Consultant
- ♦ Educator
- ♦ Author
- ♦ Keynote presenter
- ♦ Teacher trainer
- ♦ Conference speaker

Known throughout the country for motivating and engaging teachers and students, Brad has co-authored over a dozen books that provide easy-to-teach yet mathematically rich activities for busy teachers while teaching full time for over 30 years. In addition, he has co-authored over 40 teacher training manuals full of activities and ideas that help teachers who believe mathematics must be both meaningful and powerful.

Seminar leader and trainer of mathematics teachers

- ♦ 2005 California League of Middle Schools Educator of the Year
- ♦ 2016 Shasta County Middle School Educator of the Year
- ♦ California Math Council and NCTM national featured presenter
- ♦ Trainer/consultant for district, county, regional, and national workshops

Author and co-author of mathematics curricula

- ♦ Simply Great Math Activities series: six books covering all major strands
- ♦ Angle On Geometry Program: over 400 pages of research-based geometry instruction
- ♦ Math Discoveries series: bringing math alive for students in middle schools
- ♦ Teacher training seminar materials for elementary, middle, and secondary school

Available for workshops, keynote addresses, and conferences

All workshops provide participants with complete, ready-to-use activities that require minimal preparation and give clear and specific directions. Participants also receive journal prompts, homework suggestions, and ideas for extensions and assessment.

Brad's math activities are the best I've seen in 38 years of teaching!
Wayne Dequer, 7th grade math teacher, Arcadia, CA

"I can't begin to tell you how much you have inspired me!"
Sue Bonesteel, Math Dept. Chair, Phoenix, AZ

"Your entire audience was fully involved in math!! When they chatted, they chatted math. Real thinking!"
Brenda McGaffigan, principal, Santa Ana, CA

"Absolutely engaging. I can teach algebra to second graders!"
Lisa Fellers, teacher

References available upon request

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Like me even more? Then please don't make copies for your colleagues. I know it's tempting when they say, "Wow! Groovy activity! Can I have a copy?" But this is how I make my money, and why are they still saying "groovy" anyway?

If we make copies for our friends, can we honestly tell our students not to copy or take things that don't belong to them? (Ouch!)

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Thanks and happy teaching,

Brad

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- **Ongoing because** when you hire new staff, simply hit "play" and the training begins. There's no need to bring back the consultant.

Fossil Making Lab

Overview:

Students will enjoy studying about fossils even more when they can create their own! In this simple and engaging activity, students will learn two ways to make realistic fossils they can keep. Inexpensive and minimal materials make this lesson a winner for all ages. I have taken all the guesswork out of the process and offer you my favorite recipes and tips.

Required Materials:

- ☒ Clay or dough (recipes are below)
- ☒ Leaves, plastic bugs
- ☒ Waxed paper

Optional Materials:

- ☐ Aluminum foil
- ☐ Plaster of Paris
- ☐ Spray cooking oil
- ☐ Toothpicks

Procedure:

1. Begin by having students go on a mini field trip to gather leaves and other objects for their fossils. Thick, highly textured leaves work best for this activity. You can also use small plastic insects or dinosaurs to make animal fossils.
2. Create the dough using one of the recipes below or simply use clay. All of the dough recipes were colored brown to look more like stone. To save work, the students will enjoy making the dough themselves. Just prepare the ingredients ahead of time.
3. Roll a piece of dough the size of a golf ball. Place it on a sheet waxed paper and cover it with another sheet. Press this down to form a disk about the size and thickness of a cookie.
4. Peel away the upper sheet of waxed paper and set it to one side. Place a leaf onto the dough and cover it with the top sheet of waxed paper.
5. Rub the leaf into the dough leaving a definite imprint. Then peel off the top layer of waxed paper and gently peel off the leaf. A toothpick may be helpful here.

6. If you are pressing plastic animals into the dough, you will not need to use the top layer of waxed paper. This was used with leaves to keep fingerprints out of the fossil.
7. Dry the dough to make the fossil harder like a stone. However, unlike real stone, these fossils are brittle and will break if the students drop them. You can air dry them in the sun, or dry them faster in an over at low heat. I set my oven to 200° for about an hour.
8. Students' names can be written on the backs of the dried fossils with a permanent marker.

Option 2: In the previous version, the fossil was represented as an *indented* image. Real fossils are not indentations. They are the actual organism that has been mineralized. Thus true fossils *stick out* rather than stick in. In this second version, I will offer two ways to use the original fossil as a mold to cast an image in bas relief.

If you want a very simple way to do this, simply wait until your fossil dries. Then lightly spray it with some cooking oil. Press a new ball of dough against it. As this second ball is compressed to a cookie-like layer, the original fossil will act as a mold. The new fossil will have a relief image of the original. The cooking oil acts as a release agent allowing you to peel away the new fossil. Dry this fossil as you did previously.

Here is a more advanced way to do this. It is more time-consuming but results in a hardier and more realistic fossil.

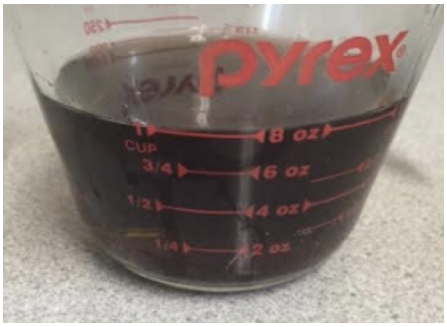
1. You will need the optional materials listed at the start: aluminum foil and Plaster of Paris. Plaster of Paris can be purchased at any store that sells paint.
2. Set the fossil on a small amount of aluminum foil. Wrap the foil around the edges of the fossil so that only the top is exposed as shown.
3. Spray the fossil and foil lightly with cooking oil to act as a releasing agent.
4. Mix the Plaster of Paris according to the directions. This will be about two parts Plaster of Paris to one part water. It should be gooey – thicker than pancake batter, but thinner than school paste.
5. I tried to dye the Plaster of Paris brown with food coloring but it always came out gray. Unless you use a product better suited to coloring the plaster, the easiest option would be to have the students paint them when the it dries.
6. Scoop some of the mixture onto the fossil inside the foil until it is about a centimeter

thick. Allow to dry overnight.

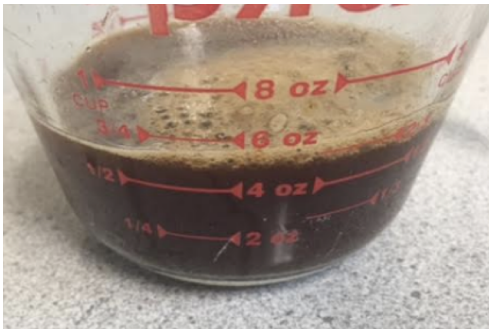
7. Peel off the foil after the Plaster of Paris has dried. This may be a little difficult for very young students. You may wish to have a parent helper or student aide help with this.
8. The fossils look somewhat like stone due to the hardness and whitish-gray color of the plaster. However, you can have students paint these to make them even more realistic. Tempera paints and water colors give very different results.

Dough recipes:

I colored my dough brown to make it look more like stone. First I used whole wheat flour instead of white flour. Then I made an even richer color by adding food coloring or some instant coffee to the water. If found that 3 parts red and 2 parts green resulted in a shade of brown very similar to the coffee.



Food coloring: 3 red + 2 green



Instant coffee

Basic Recipe:

- Materials:
- $1\frac{1}{4}$ cup Flour
- $\frac{1}{2}$ cup Salt
- Approximately $\frac{2}{3}$ cup water

Mix dry ingredients well. Slowly add water while stirring. As the dough begins to form, you can finish mixing it by kneading it with your hands.

Stone-textured dough (shown)

Materials

- Materials:
- 1 cup Flour
- $\frac{1}{4}$ cup cornmeal, sand, or coffee grounds
- $\frac{1}{2}$ cup Salt
- Approximately $\frac{2}{3}$ cup water

Mix dry ingredients well. Slowly add water while stirring. As the dough begins to form, you can finish mixing it by kneading it with your hands. The cornmeal will give the dough a rougher texture similar to stone.

If you liked this activity, you might also like some of the other lessons available in my TeachersPayTeachers store. Simply search for "**Teacher to Teacher Press**".

You can also find many free and inexpensive resources on my personal website, www.tttpress.com. Be sure to subscribe to receive monthly newsletters, blogs, and activities.

Similar activities include:

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- *Quiz Cards: A fun and inexpensive way to study any subject with electronic flash cards you build yourself!*

Feel free to contact me if you have questions or comments or would like to discuss a staff development training or keynote address at your site.

Happy teaching,

Brad