

Making Fossils in a Cup

Materials:

Modeling clay sticks (Play Dough doesn't work)

8 oz paper cups

Baby powder

Plaster of Paris

Water

Ice-cream type bucket

Wisp

Flat end screwdriver

Hammer

Paper towels

Something to make a dinosaur footprint (6" dinosaur toy that you can find at a toy store or the toy section of grocery stores)

Leaves with big veins that aren't bigger than the diameter of the cup

One-side of a shell that looks corrugated (ribbed) on top and cupped on the opposite side (You can usually find them at Roberts or Michaels or some craft store or on Myrtle Beach, Galveston Beach, etc.)

Directions on how to make the Plaster of Paris mix:

(The mix is two parts plaster to one part water.)

Warnings:

- I usually don't let elementary students make this otherwise they usually need safety glasses and gloves.
- The small ratio is 1/2 cup of plaster to 1/4 cup of water = 1 person per layer.
- However, making it for elementary students you need to make it in a large quantity. It is too hard to stir small amounts and it takes too long.
- However, don't make too much at a time because it will harden on you if you don't get it out fast enough. I usually make enough for about 8 people.

If you are doing it with elementary students, follow these directions by making it in a bucket: (Each time it is made, it is for one layer of the fossil cup.)

1. Put in the bucket four cups of plaster to 2 cups of water that is about enough for 8 people. (Put the plaster in first then the water.)
2. Stir it with a wisp. Nothing else works when making large quantities. (But making a small quantity in a cup can be stirred with a craft stick.)
3. The consistency is that of a MacDonalld milk shake—a little runny but still has consistency. You may either need to add more plaster or water to get it right. If it is too thick it will harden too fast on you and is hard to get into the cup. If it is too runny it won't set up very fast in the cup. You may want to practice before you do it.
4. This will be done for each layer.

If you are doing it with middle school students and up, they can make their own in a cup. Here are the directions:

(They may need safety glasses, and tell them not to get it on their hands.)

1. Give each student an 8 oz cup that has 1/2 cup of Plaster of Paris in it.
2. Give each student a small cup that has 1/4-cup water in it.
3. Pour the water into the plaster. (Don't pour the plaster into the water. It doesn't work.)
4. Stir it with a craft stick until creamy.
5. This will be done for each layer.

Directions to making the fossils:

1. Give each person a cup, 1/3 piece modeling clay, leaf, shell and paper towel.
(Have the students do all their work on the paper cup to make cleaning up easy.)
2. Mold the modeling clay so it looks like a hockey puck and the size of the bottom of the cup.
3. Before putting the clay in the cup make a dinosaur footprint in the clay that is at least 1/4" deep.
4. Put the clay in the cup so it fits tightly and is flat against the bottom.
5. Make the first batch of plaster mixture.
6. Pour the plaster mixture in the cup on top of the dinosaur footprint. Tap the cup lightly on the desk so the plaster goes flat.
7. While the plaster is still fresh and liquidy, put the leaf on top and push on it a little so it lays flat on the plaster and it has gone down the plaster a little. Don't push it so hard that the plaster comes up over onto the leaf.
8. After about ten minutes put a light layer of baby powder on the leaf and exposed plaster. This will keep the new plaster from sticking to the existing plaster.
9. Right after you put the baby powder on, make a second batch of plaster mixture.
10. Pour it on top of the leaf. Tap the cup lightly on the desk so the plaster goes flat.
11. While the plaster is still fresh and liquidy, put the shell on the plaster layer with the cup side down and the ribbed side up. The firmness of the plaster should hold the shell from going down into the plaster. (If it goes way down into the plaster, quickly pull it out, wash it off, and put it in again, but you rarely happens). The shell should be in the plaster about 1/8" so that when the plaster is broken apart the cupped part of the shell will stay in the plaster but the ribbed part will be exposed.
12. After about ten minutes put a light layer of baby powder on the top of the shell and the exposed plaster.
13. Right after you put the baby powder on, make a third batch of plaster mixture.
14. Pour it on top of the shell for the final layer.

Directions for breaking it open:

After a month or so (or the next day) you can break it open to see the impressions that have been made by the footprint, leaf, and shell.

1. To break each part open, you should see three thin layers on the plaster object where the baby powder is.
2. Put the end of the screwdriver on the bottom thin line to expose the footprint mold and cast. With a very small tap of the hammer, it should break it open.
3. Examine it and talk about how it could be preserved for millions of years. Tell them where they have been found in Utah and the circumstances that could have made it possible for them to be preserved.
4. Next, put the end of the screwdriver on the center thin line to expose the leaf and the leaf imprint. With a very small tap of the hammer, it should break it open.
5. Examine it and talk about how it could be preserved for millions of years. (If the leaf has been in the plaster for a month or more, you should see some carbon of the leaf on the print from the leaf and the leaf decaying a little. Tell them where they have been found in Utah and the circumstances that could have made it possible for them to be preserved.
6. Lastly, put the end of the screwdriver on the top thin line to expose the shell and the shell mold. With a very small tap of the hammer, it should break it open.
7. Examine it and talk about how it could be preserved for millions of years. Tell them where they have been found in Utah and the circumstances that could have made it possible for them to be preserved.
8. Ask other questions of what scientists could find out about the regions where fossils like these were found—arid, swampy, wet, water, etc.
9. Have them speculate what other things they could find out about the regions they could be found in—types of animals, vegetation, climate, etc.

One last experiment: The Cast Fossil

The shell that is exposed is what made the mold of the shell on the other piece of plaster. After millions of years, the shell decays away and leaves behind a mold in the sediments of what the shell looked like on the outside.

1. Tell the students that they are going to make a cast of the shell.
2. Put some baby powder in the mold of the shell (not too thick) and spread it around with your index finger.
3. Make a little plaster mixture and pour it into the mold so that the mold is completely covered. If the plaster runs over the edge of the mold it is all right.)
4. Let it set up for about 24 hours.
5. After it has set up, with a very thin blade (like that of a knife) pry under the poured plaster where the plaster meets the mold. It should pop right off. This is the cast.
6. Compare the cast with the real shell. Explain that nature does this too. Shells will decay away and leave a space in its place. The sediments walls that the shell was against will have the outside impressions of the shell left on those walls. Later on, wet sediments could run and fill up the space. When the sediments dry, the hard piece of sediments will have the exact impressions on that the shell had on it.