

Sage Cottage Science-Based Play

Materials such as:

Magic Sand

Static Wand

Jelly marbles

Insta-snow

Test tubes

Magnets

Hand Boiler

...

May be purchased at Otowi Station in Los Alamos

or

may be purchased online at:

<http://www.stevespanglerscience.com>

The next several pages are recipes, instructions, and descriptions of activities which can be done with your students

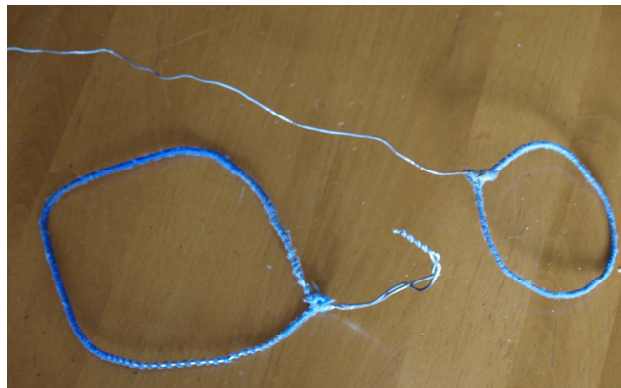
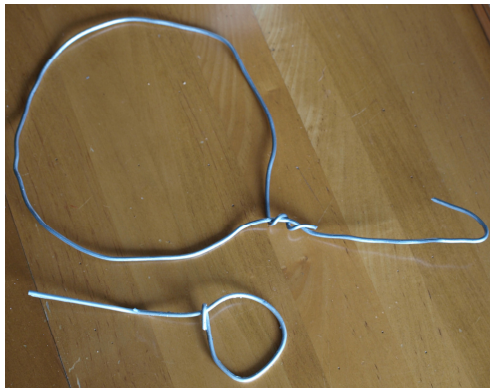
Bubbles

Materials Needed:

- 1 gallon water
- 2/3 cup liquid Dawn dish soap
- 1 Tablespoon glycerine (I use Animed D Glycerine 1 Quart – found on Internet)
- Wire clothes hangers or large aluminum wire

Directions

- Mix water, Dawn and glycerine
- Cut wire and bend into various sizes for wands. If want, can wrap yarn around wand circle for better solution absorption



A bubble is a light, thin-walled sphere of liquid containing air or gas. Soap bubbles are tensile structures. They are like stretched rubber bands that will pull in all directions and will always seek the shortest surface area between their supports. Soap bubbles are supported by air pressure.

If you wet your finger, you can gently poke it through the bubble's surface without bursting it.

Flubber

Materials Needed:

- 4 cups water
- 1.5 cups glue (such as Elmers)
- Liquid food color (optional)



- 4 Tablespoons Borax
(purchase at supermarket or online at amazon.com)

Directions

- Mix 2 cups of water with the 1.5 cups glue in big bowl
- Add food color to substance if desired
- In separate bowl, mix 2 cups water and 4 Tablespoons Borax. Once Borax is completely dissolved, **slowly** add this mixture to the water/glue mixture, mixing with hands or a wooden spoon.

Once the mixture is a consistency you like, stop pouring in the water/Borax

Experiment with the Flubber

- Poke it
- Tear it
- Squeeze it
- Bounce it
- Fold it
- Use a straw to blow a bubble in it
- Stretch it

The flubber may be stored for a few weeks in an airtight container or bag. Cleans off clothes and carpets with vinegar; out of hair with mayonnaise.

Magic Sand

Purchased from: Steve Spangler Science
<http://www.stevespanglerscience.com>

Teaches: Hydrophobic (water-fearing) vs Hydrophilic (water-loving)

Activities:

- Pour sand into container filled with water. Experience the sand properties
- Pour regular sand into a cup and magic sand into another cup. Observe how regular sand sinks and magic sand floats
- Fill bottle with water. Pour in vegetable oil and note how oil is hydrophobic. Add food coloring and note how it is hydrophilic. Discuss what else is hydrophobic (car wax, scotchguard, rain gear, ...)
- Pour some magic sand into a cup of water. Add liquid detergent and stir well. See how the soap breaks down the oil coating on the sand. Sand is no longer “magic”!

Magic sand was originally developed to trap oil from oil tanker spills. Can also be used to bury electric and telephone wires in the very cold Arctic areas. Magic sand stays dry and easy to dig even when regular dirt freezes to hard solid.

Marble Art

Materials Needed:

- Box or container with edges
- Marbles
- Paint (several colors is best)
- Small cups
- Spoons
- Paper or cardboard

Directions

- Put paint in cups and add marbles.
- Place paper or cardboard on the bottom of the box or container with edges. Make sure paper fits snug but you are able to lift the paper out easily.
- Have children spoon the marbles out of the cups of paint and put them into the box on top of the paper.
- Lift the box allowing the marbles to roll around leaving paint tracks.

Teaches a creative way to do a new art project using common items.

Paper can be used to make an invitation or a Mother's Day card, etc.

Think Outside the Box!

Ooblick

Materials Needed:

- Cornstarch
- Water
- Sensory tub (or water table) anything big enough to put hands in
- Food coloring (optional)

Directions

- Mix equal parts of cornstarch and water to create this fun gooey suspension. Add food coloring for color

Cornstarch and water will mix together but will not dissolve. This is a suspension. By definition a suspension is a substance which has the properties of a solid and a liquid at the same time.

Experiment with the Ooblick

- Poke with a finger fast
- Poke with a finger gently
- Squeeze in hand
- Let set in hand and ooze through fingers
- Bounce like a ball

Salt Paint

Materials Needed:

- Water
- Flour
- Salt
- Food coloring
- Empty dish soap bottle or something similar
- Cardboard or cardstock cut into workable pieces
(8" x 11", 8" x 8", ...)

Directions:

- Mix equal parts of water, flour and salt in the bottle. Add a little food coloring and shake.

Pour mixture onto the cardboard to create designs. Let it dry.

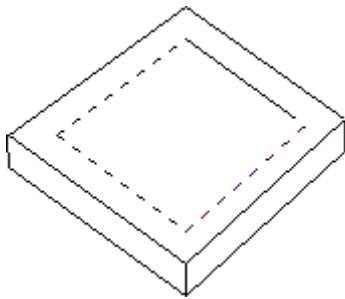
Solar Oven

What You'll Need

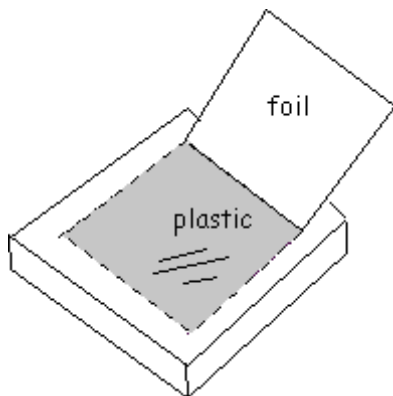
- Pizza box
- Black construction paper
- Aluminum foil
- Clear plastic wrap or plastic laminate
- Tape (possibly glue), scissors, ruler
- Wooden dowel, pencil, or straw

Process

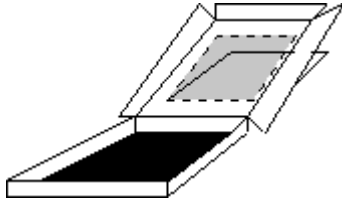
Draw a one inch border on all four sides of the top of the pizza box. Cut along three sides leaving the line along the back of the box uncut.



Form a flap by gently folding back along the uncut line to form a crease. Cut a piece of aluminum foil to fit on the inside of the flap. Smooth out any wrinkles and glue or tape into place. Cut a piece of plastic to fit over the opening in the pizza box. Tape the plastic to the underside of the box top. Be sure the plastic is tightly sealed so that the air cannot escape from the oven interior.

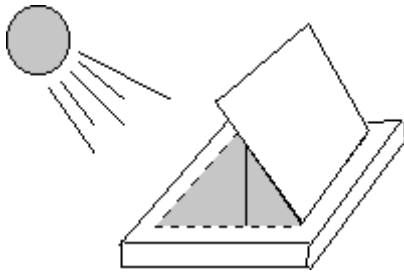


Cut another piece of aluminum foil to line the bottom of the pizza box and tape or glue it into place. Cover the aluminum foil with a piece of black construction paper and tape into place.



Close the pizza box top (window), and prop open the flap of the box with a wooden dowel, pencil, straw, or other device and face towards the sun. Adjust until the aluminum reflects the maximum sunlight through the window into the oven interior.

Your oven is ready! You can try heating s'mores, English muffin pizzas, or hot dogs, or even try baking cookies or biscuits. Test how hot your oven can get using a simple oven thermometer!



Static Wand

Purchased from: Steve Spangler Science
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Teaches: Static electricity

Two negatively charged items repel.

Activities:

- Fun to make mylar tinsel float and do tricks
- Make a static stick
 - rub fur up and down on a plastic tube. Drop tinsel onto tube and observe how it repels
- Make a static balloon
 - Rub balloon on your hair to give it negative static charge. Stick balloon to the wall. It sticks to the positive charge on the wall
- Make hair stand up
 - Run a wool cap on your head. Hair stands up as the positive charge in each strand repels from each other

Hand Boiler



Wrap your hand around the bottom of the boiler and watch the liquid bubble up to the top.

What is happening?

When the liquid is heated with your hand, an increase in temperature creates an increase in pressure which causes the liquid to move up the tube to the top bulb. When enough liquid transfers from the bottom bulb, alcohol vapor is forced up the tube, causing the liquid in the top bulb to appear to "boil."

As liquid in a closed container heats, the pressure increases forcing the liquid up the chamber.

How to Compost in a 5-Gallon Bucket

Step 1

Purchase or obtain a 5-gallon bucket with a cover and handle. Wash the bucket thoroughly with soap and water to remove any residue.

Step 2

Drill $\frac{1}{4}$ " holes around the bottom edge of the bucket for liquid drainage. Drill additional holes randomly around the sides of the bucket for air circulation.

Step 3

Fill the bucket with organic material, starting with a thin layer of broken twigs on the bottom. Fill the bucket with alternating layers of brown and green material in even quantities. Too much green material will cause the compost to smell strong.

Step 4

Add a thin layer of garden soil over every other layer to introduce microorganisms to the compost. Lightly water the soil to moisten it without making it wet.

Step 5

Place the bucket with lid attached in a sunny location that has partial shade in the afternoon. The bucket contents need to warm up without getting too hot. This will initiate decomposition.

Step 6

Check the moisture periodically to make sure the contents do not dry out. Add a small amount of water to moisten if the contents appear dry.

Step 7

Roll the bucket periodically to mix the contents. This will increase air circulation and assist with decomposition.