



## Silicone Rubber -- an overlooked classroom material

by **Thinkenstein** on March 18, 2012

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I'm a refugee from Los Angeles, living in backwoods Puerto Rico for about 35 years now and loving it. I built my own home from discarded nylon fishnet and cement.

### Intro: Silicone Rubber -- an overlooked classroom material

100% RTV Silicone Rubber comes in grease gun cartridges at the hardware store. It is a pasty synthetic material that hardens into flexible rubber after losing acetic acid fumes to the air. The odor is sharp, but if you don't get your nose too close to it, you are OK. Use adequate ventilation. Powdered pigments in a wide range of colors are available online. ( [http://www.dickblick.com/search/?q=powder+pigments&x=26&y=9&sp\\_cs=UTF-8](http://www.dickblick.com/search/?q=powder+pigments&x=26&y=9&sp_cs=UTF-8) )

Silicone rubber has been an overlooked sculpture material for a long time. I would be surprised if I was the first person to think of using it in sculpture, but I'm sure I wasn't the only kid to tickle that sample dab of silicone they used to stick on the display cards and wonder what else it might be good for.

It could be used in schools to make biological and architectural models, art and craft projects, jewelry and other things. Since it also has survival value for things like stopping leaks, and repairing things at home, it is a good material for students to become familiar with as part of their general education.







#### Image Notes

1. This Banana Farmer carrying a raceme of bananas is about 6 inches tall. The base is wood.



### Step 1: Tools

The silicone usually comes with an aluminum foil seal inside the cartridge that you have to break with a stiff wire after cutting the tip of the cartridge.

100% RTV silicone rubber comes in a few basic colors, such as clear, white, black, bronze, and aluminum. You can make your own colors by mixing powdered pigments with clear silicone. Mix the ingredients on a palette with a palette knife. Transfer silicone to plastic tipped hypodermic syringes (pet store) for precise extrusions and fine details.

You can build forms up like a clay coil pot, extruding lines upon lines to build up walls of silicone. Work on a wire armature to build figurines, etc. Spread it on a non-stick flat surface to make sheets of the material. Polyethylene plastic makes a good non-stick work surface. I have a polyethylene plastic kitchen cutting board that is my favorite work surface.

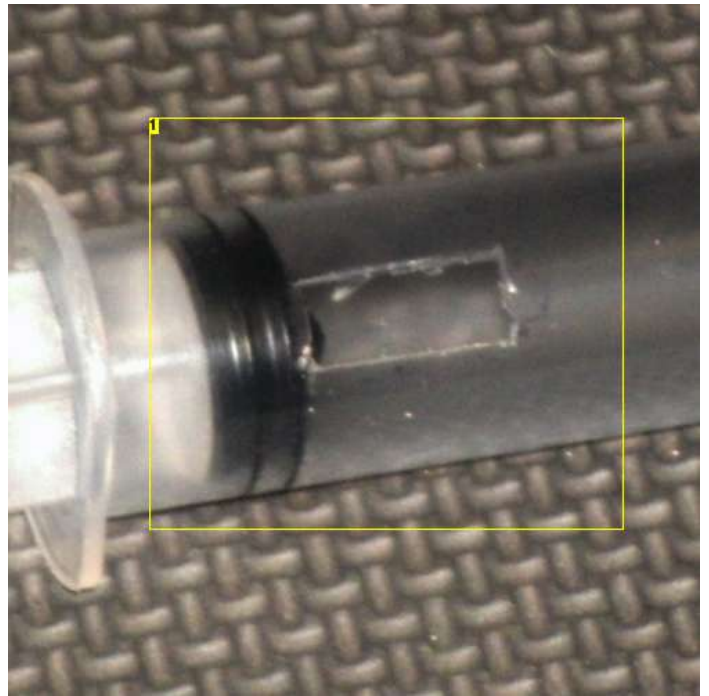
Save your empty cartridges, clean them out, and use them for other things, such as maracas, or for artist's acrylic paint dispensers.



#### Image Notes

1. This is the piston cup that pushes the silicone through the cartridge.





#### Image Notes

1. The filling hole in the side of the syringe.

#### Image Notes

1. A hole is cut in the side of the syringe for packing it with a palette knife. Some air is left at the front of the syringe. The hole is covered with the palette knife and the plunger is pushed forward, expelling the air from the front, while sealing the air out from behind.

## Step 2: Technique: Drawing in Air

The key word in this technique is "gravity". If you extrude a line of silicone rubber from point A to point B in space, the line is going to sag and make an upside-down arch in a vertical plane. If your goal is to have a right-side-up arch, then you have to make it upside-down and then turn it right-side-up when it hardens.

In the process of making a complex sculpture form, you may be wanting to work with the piece on its side, or in any number of other positions for doing the the actual extrusion work. For that, it helps to have a work station with appropriate places to hang your growing work from.

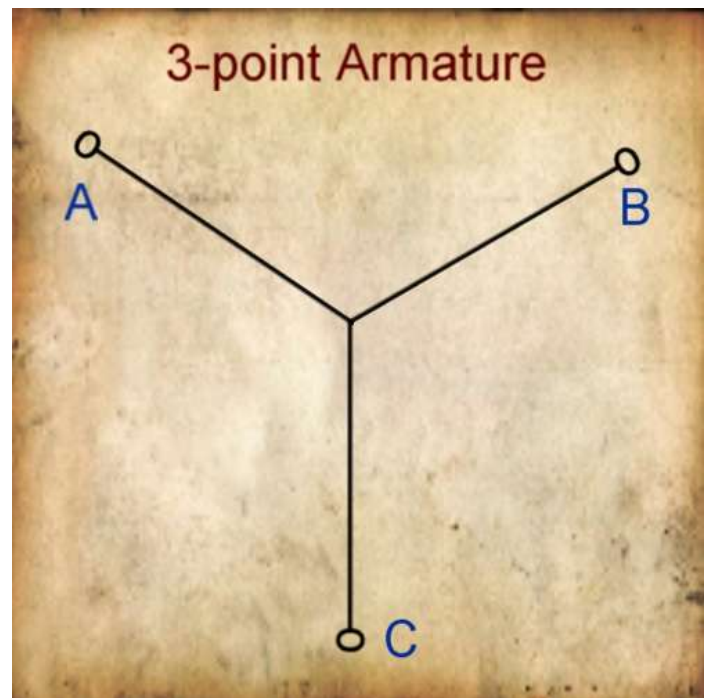
Since three points define a plane, to hang your work (the imaginary plane) in any position it helps to have three attachment points on the armature. The armature can be of a rigid material, such as iron wire, or a flexible material, such as string. If you use string, the whole sculpture will be wobbly, like 100% rubber, and you may need to attach it to a temporary rigid frame to control it. A rigid armature adds rigidity to the sculpture and doesn't need a temporary work frame. As you can see from the photos below, an armature with three attachment points is not an absolute necessity. It's just a useful basic principle.

You can work from any overhead attachment points, but if your work space is not designed with such attachment points in the ceiling, you can use a sort of universal solution; a tripod to suspend work from. I already had some 3/4" EMT electrical metal conduit tubing tripods made for other purposes. They use full lengths of pipe and are 10 ft. tall. If your ceiling limits the use of such a tall tripod, you can shorten the tripod legs. Remember to protect your floor with rubber feet on the tripod legs.

See: <http://www.instructables.com/id/TRIPOD-for-displays-or-painting> for instructions in making the tripods. The tripods have educational display uses, also.





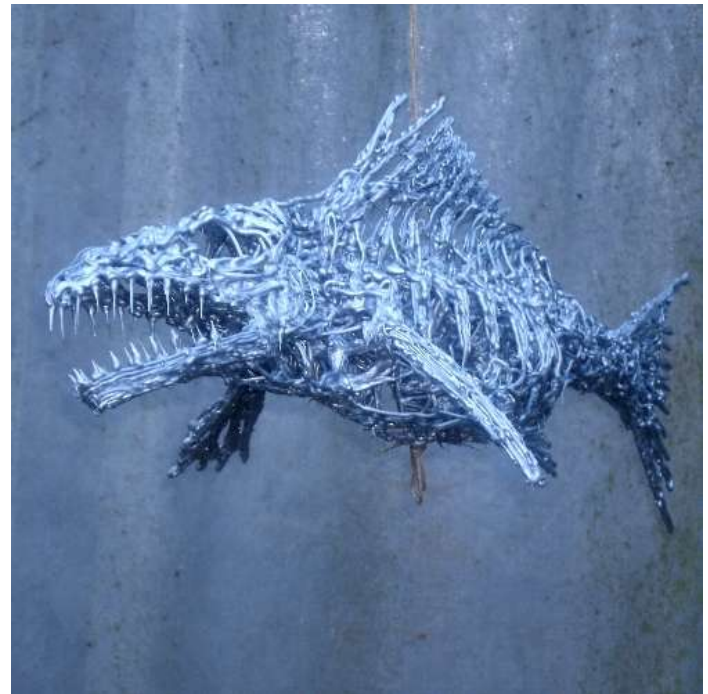


### Step 3: Technique: Drawing on a Flat Non-stick Surface

You can do flat designs, or flat parts for larger designs, by extruding silicone on a flat non-stick surface. Polyethylene plastic is a good material for the flat surface. You can stretch trash bags over a board as a cheap surface to work on. I prefer a rigid polyethylene kitchen cutting board, like this one I got at Sam's Club.

After the silicone hardens, you just peel it right off.

The parts below are mostly fins for a fish sculpture I made.



#### Image Notes

1. You can draw small designs and make jewelry this way, too.

#### Step 4: Technique: Over Clay, then Remove the Clay

This sculpture uses a PVC pipe armature. The forms were then built up with clay over the armature. A layer of silicone covered the clay. When the rubber hardens up, cut the silicone to dig out the clay, patch the silicone and then colorize it. Paint doesn't stick to silicone. You can make a paint substitute by mixing powdered pigments with clear silicone and brushing or rubbing it onto the surface. In this case, I used metallic pigments and clear silicone.



#### Step 5: Technique: Over a Balloon, then Pop the Balloon

This is a honker, like an antique taxi horn, only prettier.

Inflate a balloon, tie a string to the neck and suspend the balloon by the string for covering the surface with silicone rubber. I ran the string through a PVC fitting first, to then add on the PVC neck with a sounding reed inside it. It was then colorized with different colors of silicone. As you can see, one can get very decorative with the extrusions. You can even get into jewelry with multi-colored fine extrusions.

After the silicone on the balloon is hardened up, pop the balloon and extract the pieces with tweezers, chopsticks, etc.







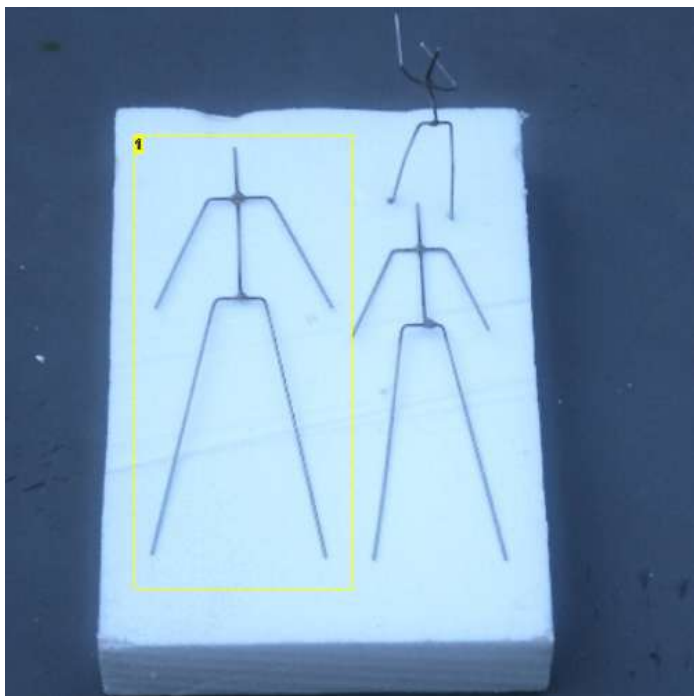
#### Image Notes

1. These are all syringe extrusions. The inlaid "jewels" are clear silicone mixed with glitter. I spread it down on a smooth polyethylene surface. When dry and peeled up, it had a smooth polished surface. The material was easy to cut with scissors and adhere with a syringe and more clear silicone.



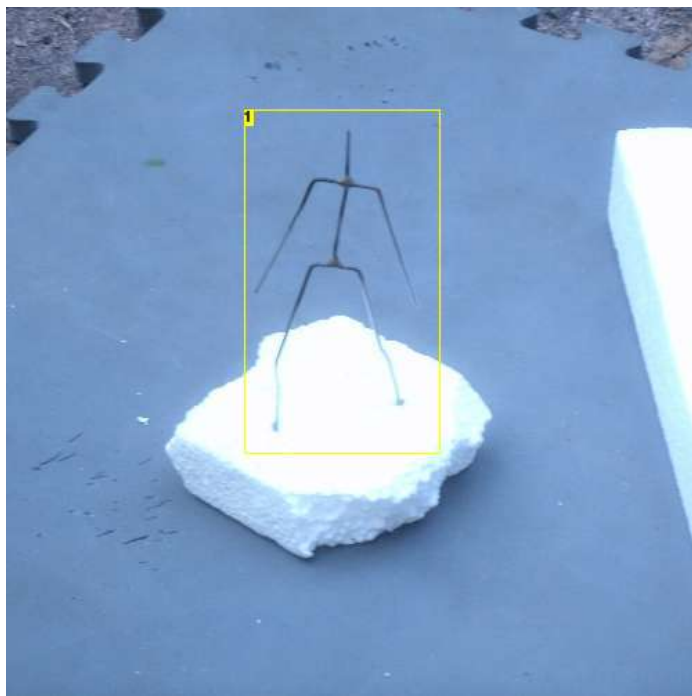
## Step 6: Technique: Wire Armature

My favorite wire armatures for small sculptures use stainless steel welding rod joined with silver solder. Silver solder is stronger than lead solder, but you can still do it with a propane torch. You don't need a welding torch. These armatures should last a lifetime, and more.



### Image Notes

1. Silver soldered stainless steel welding rod is used for the armature.



### Image Notes

1. Bend the armature and set the long leg wires in the base.



### Image Notes

1. Hiker with a driftwood base. The background is a rather ungraceful photoshop job.



### Image Notes

1. Sitting and Thinking. Three armature wires penetrate the base at the seat and the two feet. If you can get three points instead of just two, it is stronger. Because of silicone's light weight, you can usually get by with just the two feet.





#### Image Notes

1. A Hippy Dancer, about 6 inches tall on driftwood.

### Step 7: Silicone Rubber and Fiberglass

<http://www.instructables.com/id/SHOWER-CURTAIN-Silicone-and-Glass-Fiber-Mat>

This silicone rubber and fiberglass mat shower curtain will probably be good for 30 to 50 years outdoors. That's the normal guarantee on the silicone rubber, anyway.

To saturate the mat material, or other cloth material, lay out some non-stick plastic on the floor. I used a big roll of moisture barrier plastic that was bigger than the project. Lay out the mat material, or cloth on the floor and use a palette knife or similar tool to spread and press the silicone through the pores of the material. When it hardens up, peel it off the non-stick plastic, turn it over, and spread out another layer on the back side.

You can get painterly and textural effects with colored silicone, also. How this might tie in with classrooms is hard to say, but if you every need a thin sheet of silicone rubber, here's a way to make it. It's water-proof. As an outdoor canvas for painterly expression, it has possibilities.

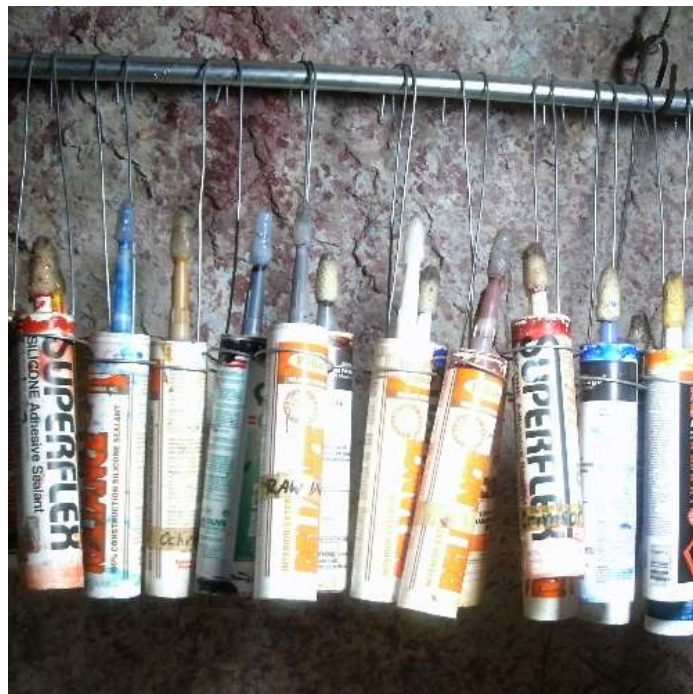


## Step 8: Recycling the Empty Cartridges -- Acrylic Paint Storage

When the silicone rubber cartridges are empty, I push the plunger cup out the back of the cartridge with a piece of 1/4 inch rebar and clean them out.

One use for the cartridges is as paint dispensers. I buy bulk acrylic paints in jars, because it is cheaper that way. Opening and closing jars to take out little dabs of paint all the time results in drying and a lot of waste paint. I solve the drying problem by packing it into empty silicone cartridges. I make non-stick silicone rubber caps that just pop on and off the end of the cartridge to air seal the paint. There are never any stuck-on screw tops to deal with. Use a grease gun to squeeze out the paint you need.

The empty cartridges are also good for making musical maracas, using two plunger cups to position the seeds in the end area of the cartridge. The maracas look just like the silicone cartridges, so there's not much point in showing a photo of the maracas. You've seen the cartridges.



### Image Notes

1. A little silicone mixing bowl, made over a tuna fish can, I think, with mold-release wax on it so the silicone wouldn't stick permanently.
2. This little mixing bowl has a base of silicone-saturated cloth, with an extruded silicone ring on top of it.





#### Image Notes

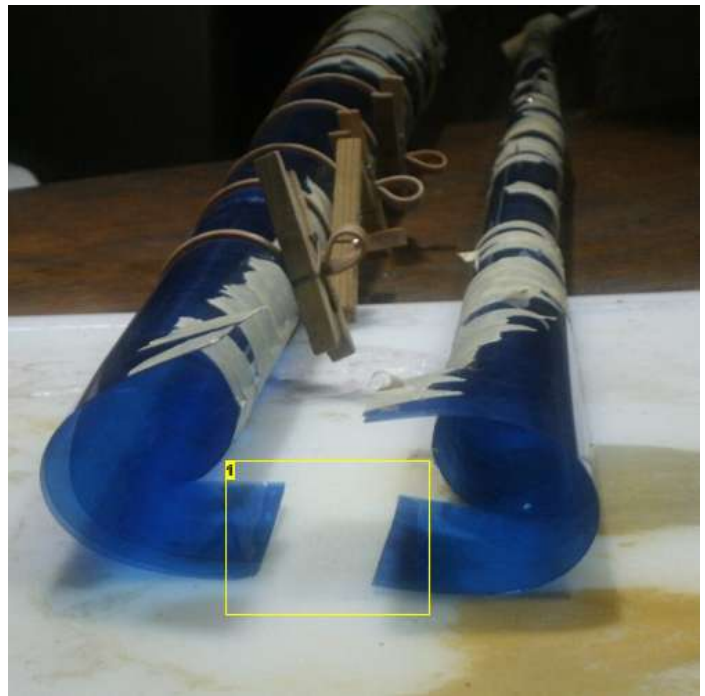
1. Silicone rubber cap -- formed over the uncut tip of a new cartridge.

### Step 9: Silicone in the Music Department

Silicone rubber is a good material for sticking together this beautiful blue plastic material I get after cleaning the images off of x-ray film. I get the rejected x-rays free from our hospital. I fill plastic-tipped hypodermic syringes from the pet store with silicone for precise application of the silicone.

I also use silicone to make drum head material; sometimes cloth-reinforced, and sometimes over a layer of x-ray film material. The sound is different; no better, no worse, just different.

Really, your school is missing out on a great material if you ignore this one!



#### Image Notes

1. The flaps made by the "T" cut spring outward and are joined to make a big oval .



#### Image Notes

1. These plastic-tipped syringes are available at pet stores. The washer helps one exert more pressure by making a bigger finger rest.



#### Related Instructables



**Silicone Rubber Fish Sculpture**  
by Thinkenstein



**Silicone Rubber Sculpture Techniques** by Thinkenstein



**The Amazing yet Simple Rubber Band Attack** by iselingier



**Convenient Paint Storage** by Thinkenstein



**TRIPOD for displays or painting** by Thinkenstein



**Livingroom Car Seats with Silicone Rubber Feet** by Thinkenstein



