

Lifecasting - hands

by [stienman](#) on May 26, 2007

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Intro: Lifecasting - hands

One of the engineers I work with was fascinated by a hand casting booth at the 2005 Ann Arbor Art Fairs. The operator would, for a nominal fee, mix a container of goop into which the customer would insert their hand, or occasionally couples would insert their clasped hand. A smaller container was used for children's hands.

After a few minutes, they would wriggle their hands free, and the operator of the booth would pour a plaster compound into the mold, and have the customer return in 30 minutes for the finished piece.

My coworker didn't pay to have his hand cast, but instead did a little research online, and for Christmas obtained all the materials and did casts for all his nieces and nephews.

Since that time I've wanted to do it for my children, but for various reasons never did so. I decided I would try this out for mother's day - if I make four molds, one for each child, then make three castings from each mold I would have enough for a complete set of four for their mother and each grandmother.

This is a Mother's day present I can really sink my hands into!



step 1: Requirements and Preparation

Materials

Alginate

This molding compound forms a rubbery elastomer within minutes of mixing with water. Captures impressive detail, while being flexible enough to prevent entrapment of the hand. It dries and shrinks over time, so it's not suitable for more than a few castings. I used ALG-390 from Special Effect Supply Corporation, which is a 3 minute set alginate.

Casting Plaster

Many plasters are available for casting, you can even use the inexpensive local plaster you find in any hardware store. I used a particular formula called Hydrostone which features high strength, and high detail. This also came from FX Supply, as item HYD, and is a 20 minute set plaster.

Mold containers

I used 1/2 gallon jugs, 1/2 gallon juice bottles, and 2 liter pop bottles. The only difference was that when I needed to cut away the mold, the plastic juice bottle and 2 liter bottles were a little harder to cut.

Hot water

A cold mold is uncomfortable, so start with hot water. By the time you get it mixed it should be at a comfortably warm temperature.

Machine screws and nuts

If you don't want to break the mold, you have to have something sticking out of the casting once it's hardened in order to pull it out. Can also be used to mount the finished piece onto another project.

Small pieces of cardboard

Used to hold the screws in place while the casting cures.

Tools

Mixer

I used a cordless drill and one egg beater. A regular mixer should work, and for large batches a jiffy mixer (paint mixing drill attachment) is recommended. Don't plan on mixing this by hand as there isn't enough time. Also note that the plaster is abrasive and may damage the beater.

Scale

These materials settle and compress so they should be mixed by weight. However, the working range of the mixture is pretty good, and in a crunch I believe suitable result can be obtained from volume measurements which will be detailed below. I'm using a postal scale that can measure in tenths of ounces up to 10 pounds, which is

<http://www.instructables.com/id/Lifecasting---hands/>

the range needed for small hand molds and casts.

Containers & cups

You'll want to stage your materials, measuring both the water and powder into separate containers, and then mix them together. Therefore you'll need containers suitable for holding the pre-measured materials. The cups are useful for scooping powder out of the supply buckets.

Watch or Timer

You'll need to time the molding process fairly carefully to obtain good results, so keep a timer handy. When you're elbow deep in any project it can be hard to accurately judge time.

Box knife

Used to cut the molding container top off, and later cut the container away from the mold when you want to break the mold.

Long sharp knife

I found it necessary to cut and level the top of the mold so the cardboard holding the screws was level. A knife long enough to cut all the way through prevents tearing the mold.

Scissors

Used to cut the top off the molding container, and is more convenient than the box cutter for some containers once the cut is started.

Pocket multi-tool

Used for a variety of tasks, depending on your skill and the tool it may replace several of the other tools.

Plastic forks, paper towels

Not necessary, but you may want them on hand for various tasks, such as scraping hardened molding and casting materials off various surfaces, cleaning spills, etc.

Please note that while the materials are not generally toxic (check with your supplier), you should not use any of these tools for food later.

Workspace

Tool/Material layout

You'll need a full table for your first time. It can be done in a smaller space, but room to work is helpful as you may be worried about time during the molding stage, and looking for a spot to set the water pitcher is a distraction.

A chair for the person whose hand is being molded is nice. People tend to shift their weight frequently when standing, which can cause a mold to be damaged while setting.

A utility sink is useful for later cleanup.

Assistants: This can be done alone, though in my case I had four eager assistants helping me by taking pictures, holding containers during mixing, and providing opportunities to practice my collision avoidance and balance during the process.



Image Notes

1. Mold containers
2. Materials staging containers, scooping cups
3. Scale
4. Mixing tool
5. Alginate (Molding compound)
6. Hydrostone (casting compound)

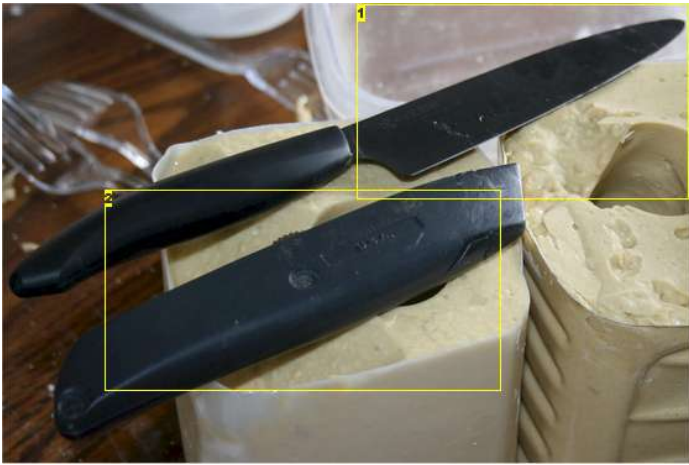


Image Notes

- 1. Ceramic knife. Very nice! Doesn't cut plastic as well as fingers, though.
- 2. Typical box cutter



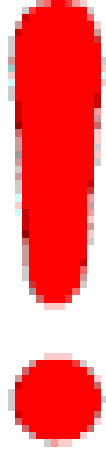
Image Notes

- 1. 45 seconds is actually a pretty long time to mix...

step 2: Caution/Warning

Read through all instructions and understand that some steps require quick multiple step actions that will not leave you time to read the instructions. The materials are non-toxic, but the powder should not be inhaled (think about what happens when molding or casting compound comes into your moist lungs), and any skin that comes into contact with the materials should be thoroughly washed afterwards. Don't use tools and containers that will be used for food preparation afterwards. Also keep in mind that many, if not most, molding and casting compounds are exothermic when they react with water, they can generate significant heat which can result in burns if not handled with care.

Also follow general project safety rules. Handle knives and other sharp objects with care - prepare so you don't have to use them in the presence of children, animals, and skittish spouses that have seen you work before. Wear safety goggles when appropriate.



step 3: Glossary - Definition of terms

Alginate

A material found in algae, seaweed, and some bacteria. Most alginates used for molding are made from seaweed. When mixed with water they cross-link (similar to plastic) and trap the water into a moist, rubbery material. Over time the water evaporates and the material shrinks, hardens, and deforms.

Casting

Used as both a verb and noun. Casting, verb, describes the process of making a casting from a mold. Casting, noun, refers to the part pulled from the mold once the casting compound has cured. The part pulled from the mold is generally a "positive" part, exactly duplicating the original part molded.

Hydrostone

A form of gypsum plaster, when mixed with water cures into a long-lasting, hard material without shrinking. This is slow setting, and pours well.

Model

The person and/or object being molded.

Mold

The form for the casting, formed as a "negative" out of a molding compound which cured around the original.

Setting/curing

Used interchangeably in this instructable to describe the process a molding or casting compound goes through to harden.



step 4: Process summary

The entire process goes as follows:

1. Measure water and Alginate for mold
2. Mix water and alginate in molding container for no more than 45 to 60 seconds
3. Place object to the molded into alginate mixture
4. Hold object still for 3-5 minutes
5. Gently wiggle object free from mold
6. Measure water and plaster for casting
7. Mix water and plaster
8. Pour mixture into mold
9. Place bolt or other fastener into casting
10. When cured (20-30 minutes) remove casting from mold
11. Allow casting to cure for additional 24 hours before working on it or painting it.

1...

2...

3...

step 5: Prepare for mold

The molding process goes very quickly, so you'll want to have everything, including the model, ready. In my case this included instructions to the young models to place their hands into the molding compound open, with fingers spread apart, wiggle their fingers and twist their hand a little, then closing their hand (or holding whatever position they chose). I had them go through the motions a few times with their eyes closed - they rely a lot on hand eye coordination, and they won't be able to see their hand inside the molding compound.

I did not instruct my children to wash their hands before molding. The natural oils act as an ok mold release compound, although clean hands should make a better impression of fingerprints and tiny features. They should certainly be instructed to wash their hands afterwards.



step 6: Measure molding compound and water

The alginate I used (ALG-390) has a 3 parts water to 1 part alginate ratio by weight. Do not mix this 3:1 water:powder by volume, as the alginate is very light. For those who choose to forego the scale and tempt fate with volume measurements, it appears that a 1:1 mixture by volume was suitable for loosely packed powder, and would result in a total volume of about 1.5. So four cups of water with four cups of alginate yields about 6 cups of molding compound.

You'll see later that due to the containers I chose, some molding powder never mixed with water, so I often ended up with a mixture that was low on powder. It worked fine, so there is some working room.

Measure the powder in the molding container, and the water into a separate container, and plan on adding water to the powder, rather than powder to the water. My first attempt I added the powder to the water, and it didn't mix into the water as quickly as I needed - a lot of powder ended up on the table.

Use warm or hot water to make the model more comfortable. 90F to 100F (32C to 37C) was suitable. Having warm water is especially important for sleeping babies.



Image Notes

1. Add the powder into the molding container. The water will be mixed into the powder in here.



Image Notes

1. Taking notes about weight
2. Measuring water into a separate container - will add this to the powder when needed. Don't add powder into the water unless you have a big container, or want a big mess.

step 7: Mix molding compound

Place the beater into the powder in the molding container, and add water while mixing. You'll need to be holding the container during the mixing as it is fairly viscous, so you may need an assistant, or stop the mixer while adding water.

Try to keep the beaters below the surface of the water to avoid adding more air to the mixture as this will result in bubbles in your mold.

Also do not beat the mixture for more than 45 seconds or so. Remember that this is a 3 minute cure molding compound. If you mix for too long you'll end up with a bad mold. Don't worry if the mixture still looks lumpy and not completely mixed.

If you have a vacuum chamber you can remove some of the bubbles from the molding compound by pulling a light vacuum from it. It may foam up, so be prepared with a large container, or a willingness to clean up a mess.

Alternately, firmly rapping the container against the table should bring up many bubbles as well.



Image Notes

1. 45 seconds is actually a pretty long time to mix...

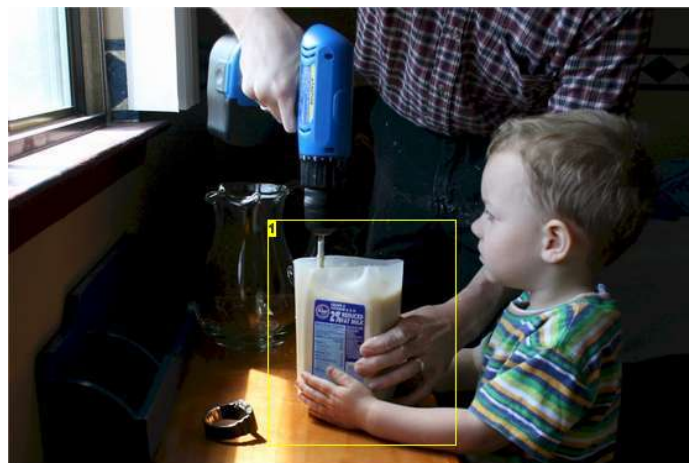


Image Notes

1. It gets firmer as more powder mixes with the water, and you may need a stronger grip than the average 2 year old can provide.

step 8: Place model in molding compound, wait for cure

The alginate I used does not heat appreciably when curing, so I didn't need to worry about possible discomfort or burns.

I earlier instructed the model to place their hand into the molding compound in an open position, then move and wiggle for several seconds before settling into the final position. This helps adhere the alginate to the hand, preventing bubbles from settling near the skin and in the crevices between fingers.

While the hands were in the mold I held the wrist firmly. This serves two functions:

1. You can help them hold the hand steady to prevent large movements from tearing the mold before it cures
2. You can feel the tendons in their wrist move as they work their fingers. This will help you know when to remind them not to wiggle, as children will often work the unfamiliar, squishy, warm material in their hands if not monitored.

Babies are especially prone to hand movement, so often it is best to do this while they sleep. Make sure the molding compound is warm to the touch, but not hot, and make sure the baby is in a comfortable position for the mold. As you can see in the picture, our youngest child woke up during the process, but was still laying comfortably and only required a little singing to prevent wiggling and worrying. As you can't easily instruct the baby to wiggle their fingers or move their hand in the beginning you'll have to move it around by the wrist when you insert the hand. In this case I pushed the hand in, moved it side to side to side to side, then partially removed and re-inserted it.

I usually wait about 5 minutes from the beginning of mixing until I attempt to pull the model from the mold.

Short hair is not typically a problem, it pulls easily from the mold, but if the model has long hair or thick hair on the part to be molded you may consider using a mold release compound to prevent discomfort and mold tearing, such as a little petroleum jelly. Children and most adult hands won't have this issue, but keep it in mind. Also note that rings are duplicated, but some rings will tear the mold during removal. You might try having the child hold an object (ball, toy block) or molding with a ring, but leaving the ring in the mold. These objects may either be removed from the mold and be replicated by the casting compound, or you may leave them in the mold to become part of the casting, as rings and balls can be difficult to put into place on a hardened casting.

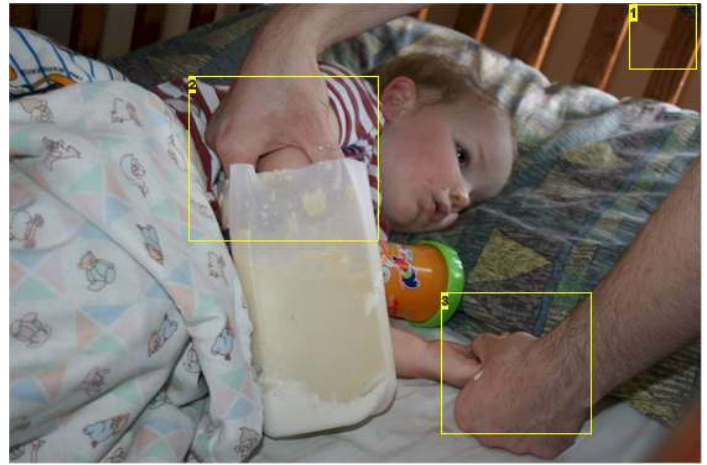
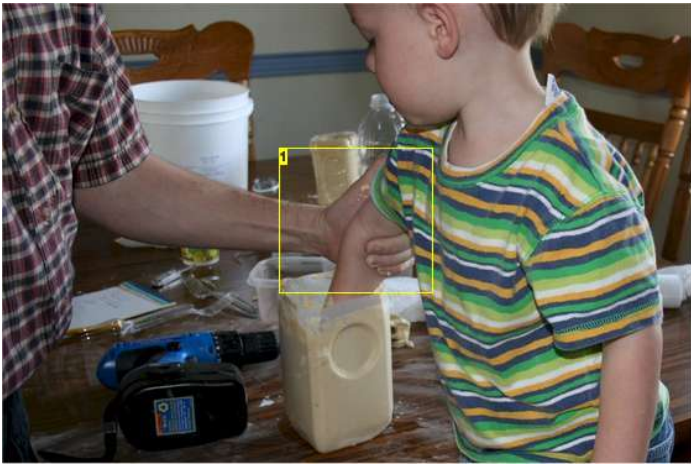


Image Notes

1. Since you are watching the clock, you could also take a pulse to make sure they're not zombies and you just never noticed.

Image Notes

1. Singing... Teach me to walk in the light of His love, teach me to pray to my Father above, teach me to know of the things that are right, teach me, teach me, to walk in the Light...
 2. Not a zombie either.
 3. Gently rubbing other hand

step 9: Remove model from mold

Once the mold has cured, about 5 minutes, carefully push the wrist towards each side of the container to pull the mold away from the skin. Instruct the model to wiggle their fingers a little bit while gently pulling out. If they formed a fist, tell them to try to uncurl their fingers as they pull out so the molding compound inside the fist stays attached to the mold. Don't worry if they pull it out, though, it'll hardly be noticed in the casting later, and can be fixed.

The mold is flexible and will open as they remove their hand. Occasionally pushing the wrist and then the hand away from one or the other side of the mold will allow air to enter the mold, which will make it easier to remove the hand.

Rub excess molding compound from the arms and hands of the model. While they are small and non toxic, pieces of molding compound still pose a danger to small air passages.

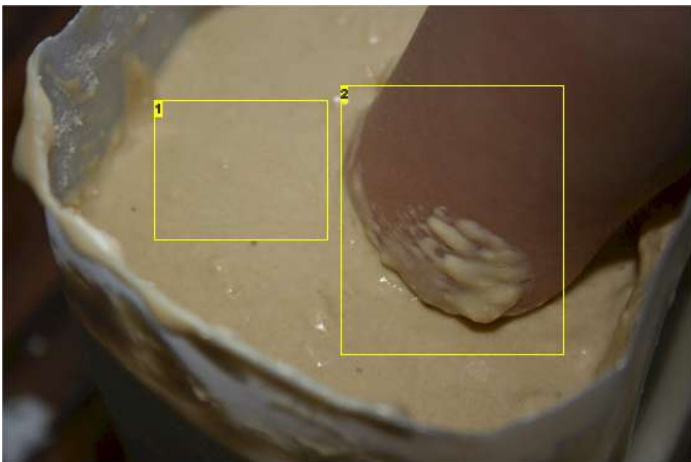


Image Notes

1. Shiny, slick, rubbery, thick.
 2. Is your hand hiding from you!

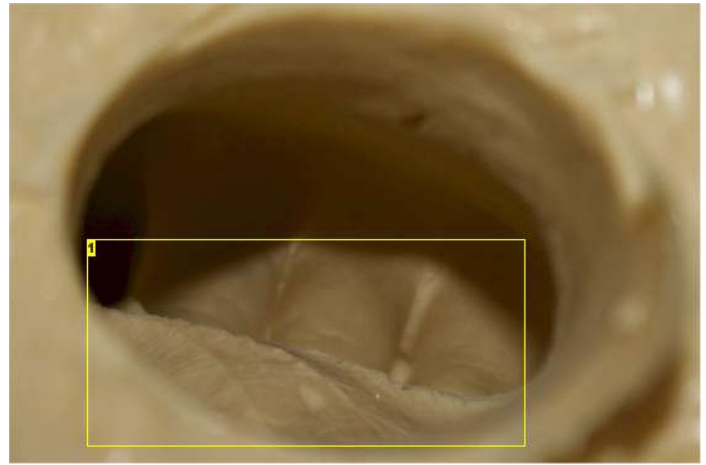


Image Notes

1. Don't steal my child's palmprints! The detail is that good. I expect that if one made gelatin molds from this, one could reasonably expect to fool many fingerprint scanners.

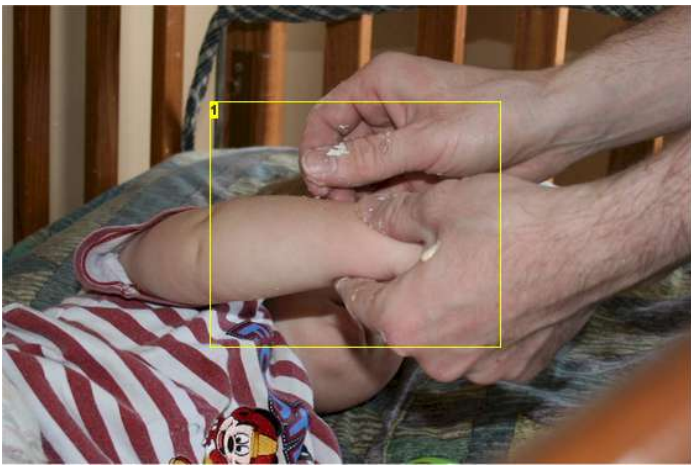


Image Notes

1. Remove bits of molding compound

step 10: Prepare for casting

Inspect the mold. There may be water pooling inside the mold, which will need to be drained. Also, you may want to level the top of the mold for easier fastener attachment.

Note if the mold has any overhangs that will form air pockets when the casting compound is poured.

Prepare the fasteners to be held in place during curing. In my case I chose to embed the nut into the casting, so I attached a screw and pushed it through a piece of cardboard which would rest on the mold during curing. If you insert a dowel into the casting you will be able to use wood screws to attach the casting, or chip the wood out later and use epoxy in the hole left behind.



Image Notes

1. The beater doesn't reach all the corners, so the material isn't thoroughly mixed.



Image Notes

1. Draining excess water

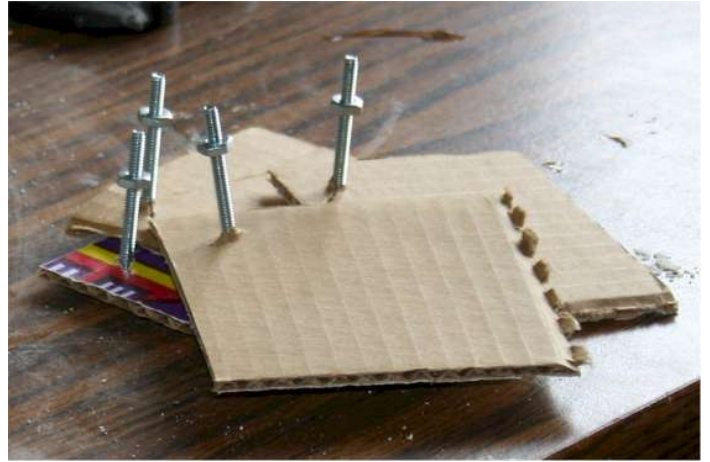


Image Notes

1. Cut and level tops.

step 11: Measure and mix casting compound

The casting compound I used expects to be mixed at a ratio of 32:100 water:powder by weight. Rather than wonder why they didn't round it off to 1:3, I went ahead and rounded it myself. Keep in mind that this is the opposite ratio to the alginate.

For those who wish to measure by volume, I found that loose Hydrostone powder can be mixed as a 1:3 water:powder by volume, and would result in about a 2.5 volume mixture. So 1 cup of water (about 9oz) mixes with 3 cups (about 27oz) of Hydrostone to make about 2.5 cups of plaster mixture.

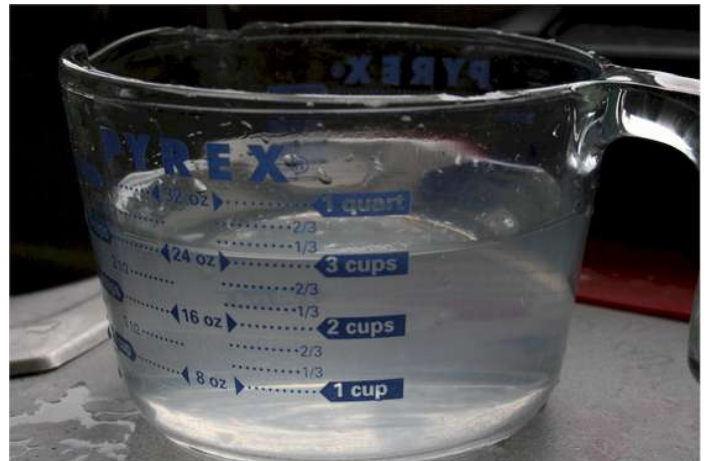
Do not use hot water. The compound is exothermic and releases heat as it cures. Further, the compound cures faster with warmer water.

As there is no significant time factor here, you can take your time mixing the water and casting compound together. Note that the resulting volume is more than the water volume but less than the casting compound. For this reason I also mixed the water into the powder.

Try to avoid letting air mix into the compound, but mix it thoroughly.

If you let it sit for more than a minute after mixing, consider mixing it again before pouring as it will settle and result in a thinner mixture being poured.

My 7 year old's hand has a volume near 2/3 of a cup, so for four hands this size and smaller, 2.5 to 3 cups should be sufficient.



step 12: Pour casts

Make sure the mold is free of debris and water, and then fill it with casting compound. If you intend to pull more than one casting from this mold, or do not want to break the mold to remove the casting, consider using a mold release spray inside the mold before pouring.

While twisting the mold around, pour the compound back into the casting mixture. By pouring it out, small bubbles that form against the mold are popped, and a thin layer of casting compound adheres to the mold. This will also help you find air pockets in the mold that may require extra attention by observing how the liquid pours.

If the mold has overhangs, they may form air pockets that will prevent the mold from completely filling. You have to pour a small amount of casting compound into the mold, and then tilt it so the air bubbles out from under the overhang and traps casting compound under it, then add more and repeat the tilting until full. This is not fool-proof. If you anticipate an overhang, you may consider adding a straw to the mold during the molding process, or before casting so the air can escape. This will add an easily detached rod to the casting.

If I had a vacuum chamber, I would pull a vacuum on it to reduce bubbles in the casting compound. Instead I picked up the filled mold, and struck it against the table several times to encourage bubbles to the surface.

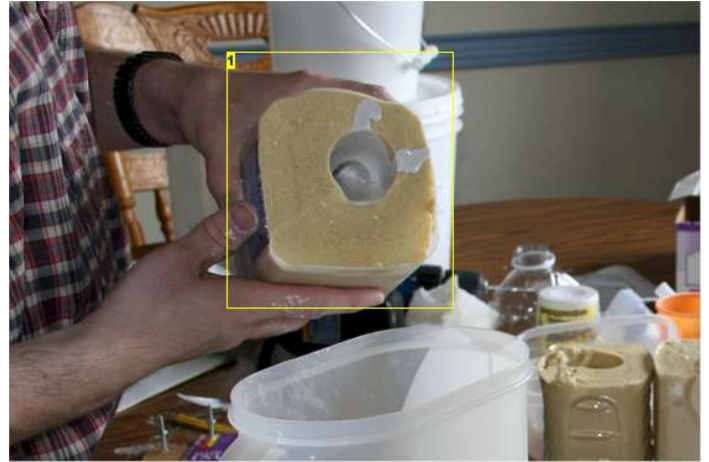


Image Notes

1. Tilt and twirl to coat interior and fill pockets



Image Notes

1. Pour out so bubbles on interior surface pop, and observe how the plaster flows out. If a sudden gush comes out when you twist it, there is likely an overhang or pocket that will need careful attention.

step 13: Place fasteners into compound, wait for cure

Suspend the fastener in the molding compound. I used a square of cardboard resting on the mold. If you have a stable surface you could suspend something using a string or wire.

If you made too much plaster (!) you have time to mix another batch of molding compound and mold something else. I chose instead to wet down the sand box and make a few sand castings (faster and cheaper than an alginate mold). If you live in an area frequented by wild animals you can make castings of their footprints by placing a paper ring around the footprint, packing a little dirt just inside the ring to prevent leaks, and pouring the plaster inside the paper form.

Wait for plaster to cure. This will take at least 20 minutes, but I generally waited 30 or more minutes.

Maybe use the time to catch up on some important reading.



Image Notes

1. Notice that the nut is embedded, not the screw head. The screw can be removed later if no fastener is needed, or a longer or shorter screw can be used to mount it.

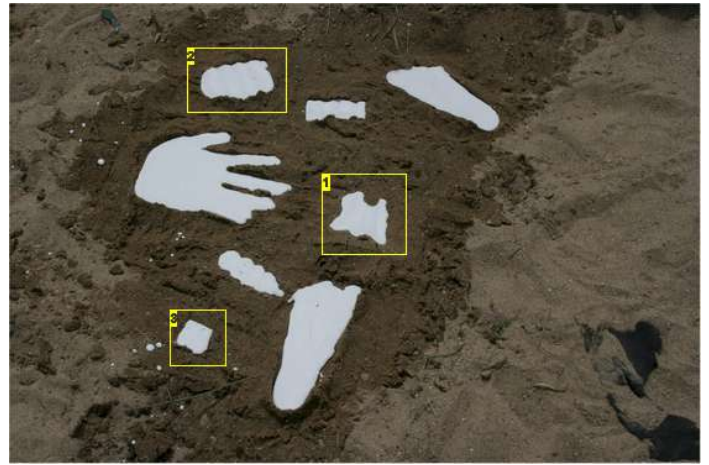


Image Notes

1. Butterfly
2. Fist
3. Mega block

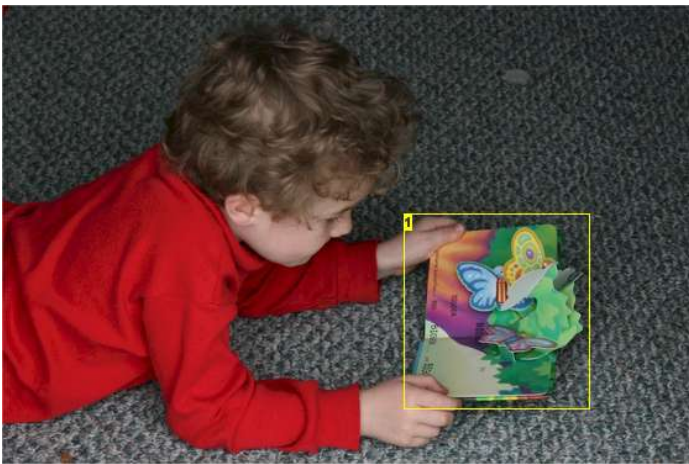


Image Notes

1. big... Bigger... BIGGEST

step 14: Remove part or break mold

The part may be removable from the mold without tearing or breaking the mold, in which case gently pull the casting out while pushing the mold away from it at the sides. Hopefully you used a mold release agent earlier, which should make this easier.

I knew by this time that I wouldn't be able to remove the hands without tearing the mold or damaging the hands. Further, the movement of the plaster inside the mold may damage some of the fine details of the casting, so I chose instead to make cuts in the mold and tear it apart in order to remove the casting.

If you don't mind damaging this casting, and you have a very good idea of where inside the mold the casting is you may be able to turn it into a two part reusable mold. Cut carefully along the edge of the mold until you reach the casting inside. Add a few irregular cuts so it will be easy to re-align the mold again during the next pour. The knife will cut the casting a little bit, and future castings will have a part line where the mold was cut. Make sure you can remove one side from the other without tearing, and pull the two halves of the mold apart. Remove the casting, and inspect and clean the mold for the next casting. You'll have to support the mold externally (another bottle, or perhaps strips of fabric or tape that won't cut into the mold). Keep in mind that the mold is going to dry and shrink significantly over the next 24 hours, so it won't last for long, and each casting will damage it a little more.

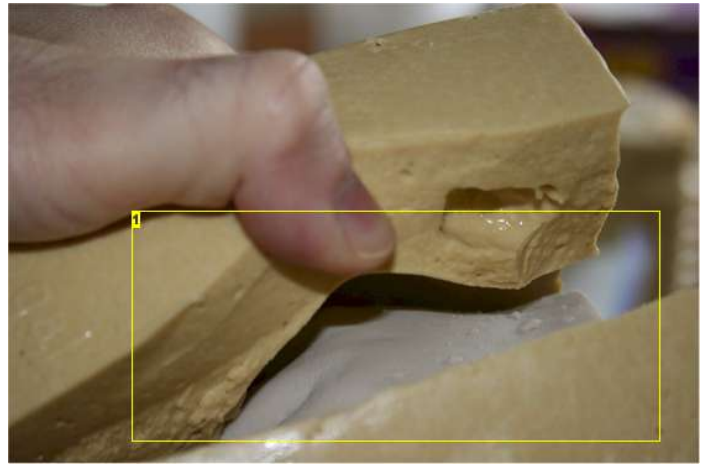


Image Notes

1. Removing the part from the mold evokes a very odd feeling of familiarity. The saying, "I know ... like the back of my hand" has a real psychological meaning, and this evokes quite a strange sense of wonder.

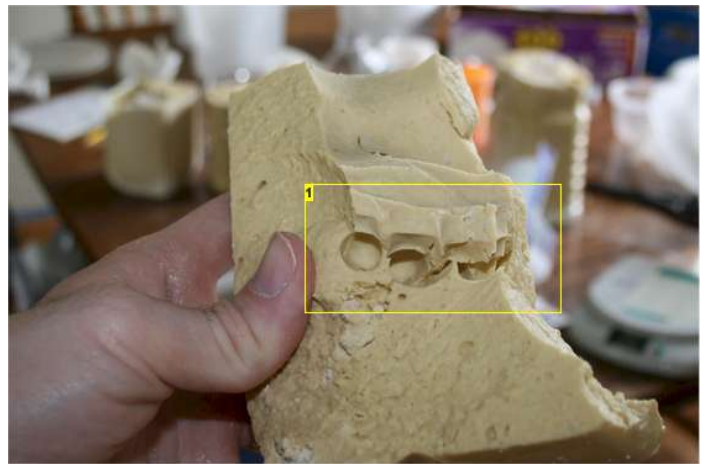


Image Notes

1. This overhang prevents me from removing the part without damaging or breaking the mold.

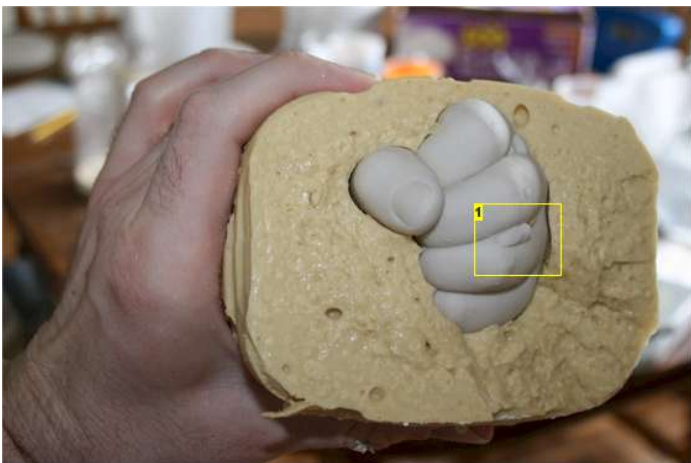


Image Notes

1. Aaaahhhh! A bubble!

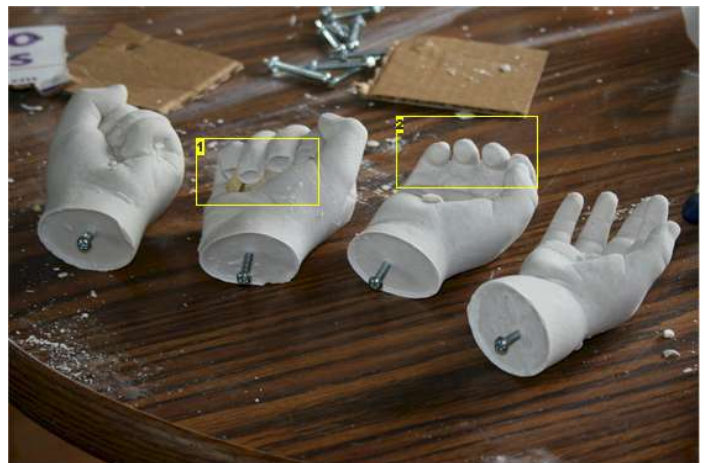


Image Notes

1. I didn't get casting compound into this overhang
2. I got casting compound into this overhang just fine.

step 15: Inspect parts - common problems

Inspect the parts. Common problems are shown below:

Air bubbles in the mold show up as bumps in the casting. This could have been reduced by mixing the molding compound carefully to avoid introducing more air, pulling a vacuum on the compound to bring bubbles to the surface (it will foam, so make sure you're prepared for a mess), and having the model move around so the compound adheres to the object, causing any bubbles to form away from the model, rather than next to it. I removed the larger of these from the casting simply by pinching them with a set of pliers. A file, sandpaper, or rotary tool with a burr would work as well though you lose detail the more material you remove. This is by far the most common issue, and one of the easiest to fix. Still, make sure they wriggle their fingers and move their hand around a lot before holding the pose during molding.

Air bubbles in the casting show up as voids and holes in the casting. This could be reduced using methods similar to those mentioned above for the molding compound. Also, as the compound is fairly liquid and takes some time to cure, a vibration table may also work well. These could be filled in with a variety of materials after the casting has cured.

Incomplete casting. If you expect a large air pocket due to an overhang, consider drilling or cutting a hole through the mold into the overhang to allow air to escape. I haven't done this myself and can't offer much advice, but I expect a sharpened metal tube could cut through the mold. Alternately, set tubes in the mold during the molding process. You may be able to fill the void by tilting and turning the mold during the casting process. There isn't much you can do here post process without a lot of work. Depending on the model you may instead remove more of the material so it appears as though it were suppose to look that way. If you still have the portion of the mold that didn't cast, you might try pouring a smaller section again and then carefully grafting it all together.

I've re-done the hand with missing fingers, but I'm leaving the rest of them alone for now - I want to preserve the detail that was captured, in spite of the flaws that were introduced.

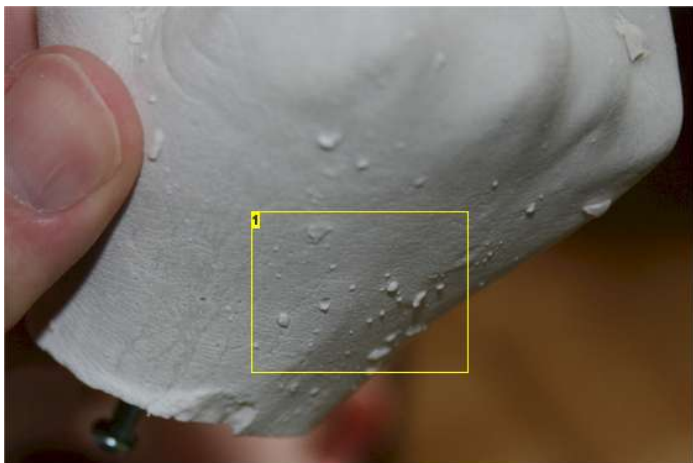


Image Notes

1. Air bubbles in the mold. May be prevented by moving the hand around a bit more before the mold sets. If I were to remove these, I'd also lose a lot of the skin texture in sanding.



Image Notes

1. Air bubbles in the casting compound.

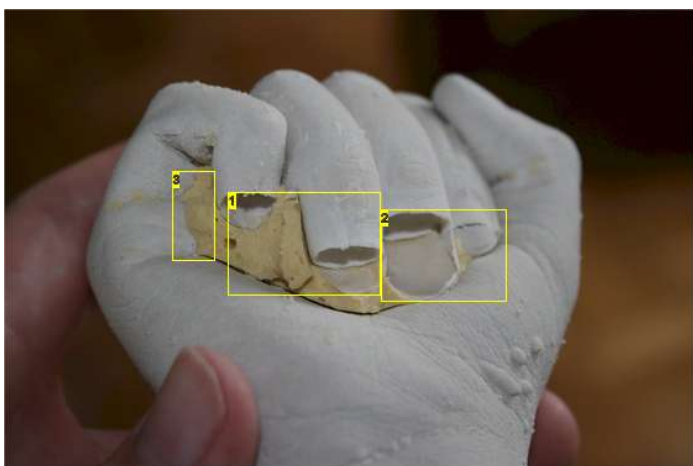


Image Notes

1. Big air bubbles in casting compound due to inadequately filled overhang.
2. The twisting and turning did coat the mold, there are thin shells of casting compound here. Slip casting uses this technique with a thicker mixture, and repeatedly coats and empties the mold to build up the shell. The finished piece is hollow, which saves a lot of materials and weight.
3. Molding compound - remove with tweezers before it dries. It's very difficult to remove once hardened without scratching the casting.

step 16: Hide the parts, avoid suspicion

Hide the parts so they are not readily stumbled upon by the recipient. You might consider camping to distance yourself from the scene of the crime... er, project...

Clean up, but don't clean up so well that *questions* are asked.



step 17: Presently present presents

I prepared a card for my wife for Mother's day from a poem I found online, as well as a generic border. I have not found out who the original author was, the poem seems to have appeared in many variations over the years, but if you have any clue as to who might have written the original or this particular variant, please comment.

Carefully wrapping the castings, I then had each child present them to their mother, youngest to oldest, and then gave the poem last.

As I expected, and as the poem alludes to, my mother-in-law was much more impressed by the gift than my wife. When you can hold the hands each day you tend not to need reminders. Over time the gifts will become more precious.

It occurred to me later that the gift might have even more impact if given several years after it was made. Perhaps when the nest is empty, or when you have your first grandchild.

This is also a great interactive gift. Consider bringing enough materials to a family gathering, maybe this next fall holiday season, to do this for nieces, nephews, and new couples. It requires more material and coordination, but a mold can be made of a couple holding hands.



But if you stop and think a while
You'll see I'm growing fast,
Those tiny hand prints disappear,
You can't bring back what's past.
So here's a small reminder,
To keep, not wipe away,
Of tiny hands and how they looked,
To make you smile some day.

step 18: Mount parts

I ran out of time, so I presented the parts pre-mounted. My plan is to mount them individually, and vertically on boards, pre-stained with routed edges. They will be mounted near one side, and the poem mounted towards the front of the board. Behind the poem will have an upright plastic 4x6 picture frame for a photograph of the child taken near the time of the casting.

Prepare the casting for mounting by sanding the mounting surface of the casting flat, and ideally parallel to the fastener. Scratch name and date of the casting into this surface where it will be hidden from view but accessible if needed later to resolve inevitable fights over who's hand it really is later.

There are many engraving companies that will engrave a simple metal plaque with the poem, child's name, and date online as well as near you. Look in the phone book for trophy places, or jewelry shops.

As there are many other opportunities and methods for mounting the finished work, I will leave this for another instructable to come. Some suggestions:

Clearcoat the casting with paint or epoxy and use it as a paperweight.

Mount it to a board, then hang the board on the wall using the castings as coat hooks.

Make a mobile out of them - make certain they are secure, each hand weighs over a pound and will hurt if they fall on you.

Have the children form sign language words and letters, then mount them in series to a longer board.

Plan ahead to do this each year or two, and make a mount that shows growth over time, including pictures in front of a height measure of some sort.

Keep in mind that while the parts are made of fairly tough plaster, it is still easy to scratch and damage. Clearcoating, or painting, is recommended for long term durability. As the part is heavy and cold (high thermal mass), a bronze or other metallic paint will cause many to wonder if it is really metal.

Make sure the part is carefully secured to the mounting board. Any looseness in the mounting will, over time, cause the fastener to work loose from the plaster. Compatible epoxy will also hold an unfastened casting to most materials.

Keepsake

step 19: How much do I need?

Quick disclaimer: The following numbers are what I experienced with my particular use of these compounds. Packing, humidity, the fact that not all the alginate mixed with the water, and my method of mixing allowed quite a bit of air to be entrapped are all factors that prevent the following information from being exact and precise. Please use it as a general guideline, and weigh your materials if at all possible.

This is the information I couldn't find when I started the project, and had to guess at, measure, and ask about before embarking on this project. These materials are sold by weight, and I could only find oblique references to possible volume. I ended up calling the company I planned on purchasing from for tips, and they suggested that 5 pounds of alginate and 10 pounds of hydrostone would be more than adequate to give me at least 5 small hand molds, and 12 or more castings. I purchased according to their recommendation, and you can see that the volume of the plaster powder in a 1 gallon tub is significantly less than the volume of the molding compound in a 2 gallon tub. I'll re-summarize my findings here:

Alginate

Mix 3 parts water to one part alginate by weight. For loosely packed material this is 1 part water to 1 part alginate to get 1.5 parts molding compound by volume, including some air entrapped in the compound. This means that for each cup of mixed molding compound you need 2/3 cup of alginate, which corresponds to about 3oz of alginate. A 5 pound tub of alginate will make somewhere in the vicinity of 48 cups of molding compound, or 3 gallons. Note that the mixture volume is greater than the volume of the powder - 1 part of powder properly mixed with the water yields 1.5 parts of molding compound.

The bottom line here is that 3 ounces (weight) of this alginate makes about one cup of molding material once mixed. So if you need four cups to make your mold, you should purchase at least 3/4 pound (12 ounces) of alginate powder.

Hydrostone Plaster

Mix 1 part water to 3 parts hydrostone by weight. For loosely packed material this is 1 part water to 3 parts hydrostone to get 2.5 parts casting compound by volume. This means that if you need 1 cup of mixed casting compound, you'll need 1.2 cups of hydrostone powder, or about 9oz of hydrostone powder. The ten pounds of hydrostone that I purchased makes close to 15 cups of casting compound, which is just under a gallon. The volume decreases when water is added - 1 cup of hydrostone, mixed properly, yields .83 cups of casting compound.

The bottom line here is that 9 ounces (weight) of this alginate makes about one cup of mixed casting material.

How much I used

I tended to make more than needed, as I would rather waste a little now for a lower chance of making a mistake than mix less now for a higher chance of having to do it over again wasting even more time and material. Now that I've done it once, though, I expect I'll be more frugal in the future.

For the 6 molds I made (re-did the eldest's mold due to missing fingers in the casting, and did the neighbor's child when he visited as payment to keep the secret) the most alginate I used was 15oz, which made over 5 cups.

The smallest amount of alginate I used was 10oz, which made just over 3 cups of molding compound. In total the six molds took about 4.5 pounds of alginate.

Each time I made more hydrostone than needed - each hand needed less than a cup. I used nearly 5 pounds of hydrostone on two pours, one for 4 hands, and one for 2 hands. In both cases I ended up with enough extra to make several sand castings.

Cost

I spent about \$85 after shipping for the materials. I have twice as much plaster as I need, and enough molding compound for another hand or two. Assuming I simply throw them away, each hand cost me about \$14. I would consider this an upper-limit for the expense.

<http://www.instructables.com/id/Lifecasting---hands/>

However, to save money, next time I would plan more carefully and do the following for each hand:

Find/prepare molding containers that suit the hand volume better.

Use about 8oz (5 cups mixed) alginate, which costs about \$5

Use about 10oz (Just under one cup mixed) hydrostone, costing about \$1

So the lower limit for a child's hand would be \$6 each, not including shipping of materials. In the future I expect that I'll probably still use more than needed, and will simply round each hand to costing about \$10, which is half what carnival and art fair hand casting booths seem to charge in this area.



step 20: What went right, what went wrong, what I will do differently next time

Well, my wife was pleased to receive the hands, and the poem made it much more significant than it would have been otherwise. Her mother's reaction was even greater, with heavy hints that such a gift would mean a lot to her as well, should I choose to do so later.

As you can see, I had two fists, one open hand, and one slightly closed hand. Most who saw these indicated that the semi-closed hand was the favorite, partially for the reason that an adult finger would fit inside just right, and the fingers could be felt separately.

I did not fully meet my goal. I wanted to pull several hands from each mold, but did not carefully consider the problem of overhangs, and the fact that the fist and hand are larger than the wrist. With suitable mold release compound one might still succeed to some limited extent, but I expect a 2 part mold would work better, and I will attempt that in the future.

The project was a lot of fun, and very satisfying. I expect I'll be using these methods to mold other objects in the future, and trying out other casting compounds such as latex and epoxy. I fully expect to do something similar for creating parts of my Halloween costume, and perhaps decorations, in the fall. The hydrostone would make excellent shards of skull or bone, and latex works great for hands, fingers, and masks.



Related Instructables



Body Casting and Chocolate Molding by MissChiff



Piggy Baby by jessiep



Shrunken head, no headhunting required! Costs under \$25. by lamedust



Kefir Kombucha Hybrid by TimAnderson



Make your own bones for Halloween by Cthulu



Make teeth mold for Halloween Teeth by MastaAzumarek



How To Cast a Face in Plaster by rachel



Make Tree Limb Coasters by modhomeecteache

Comments

[37 comments](#) [Add Comment](#)



vandal1138 says:

For some reason that hand looks kinfa freaky like that.....

Sep 13, 2009. 10:08 PM [REPLY](#)



vandal1138 says:

You can never be too sure about those pesky toddler zombies. They scream "NO!" as they climb on the table and attempt to eat your brains. Unless Yo Gabba Gabba is on. Then they behave.

Sep 13, 2009. 10:05 PM [REPLY](#)



cartola says:

Wow, I've made more with liquid silicon. Much better than plaster. Children can play with them without being afraid of breaking. And you can also try to use the same mold to do more than one copy, as the silicon is flexible and the hand gets out of the mold without breaking it.

Jul 16, 2009. 6:49 AM [REPLY](#)



cartola says:

Very cool, here is my experiment pic!

The bigger is mine, the medium is from my 4 years son and the smaller is from my 2 years son.

Jul 6, 2009. 7:31 AM [REPLY](#)



antipoda says:

Alginate is actually the best compound to use for molds with children as models. I had my hands and arms cast in plaster - at art college - and trust me, it hurts. It hurt enough for an adult to be very uncomfortable, so with children it would be even more difficult. Alginate does not warm up a lot and does not expand, the expansion of the molding material causes joint pains, from the pressure and it heats up enough to be close to painful. Alginate is also more gentle on the skin.

Jun 14, 2009. 6:40 AM [REPLY](#)

To make a mold for more copies, it might be better to plan better the poses, and to do the mold in two or more parts, not just cut up a mold. Then you can see trouble before it happens. Since alginate is slightly pliable, it's more forgiving than plaster.

I molds of both my arms above the elbow made, and we copied them in resin - the same stuff used to make surfboards - with some marble powder mixed in. It was a lengthy process, over an hour for each mold - making barriers, to make sure I could remove my hand without breaking the mold and after curing the resin we did have to break the mold. One copy took maybe five hours for a team of three adults to make. Lots of work.



tshirtnjeans says:

May 10, 2009. 11:12 PM [REPLY](#)

To ensure fine detail in the plaster pouring stage make a thinned out plaster slip. Pour a small amount in the mold and rotate. Remove excess and repeat 2 to 3 times, then do your final fill. You can also hollow at this point by filling a balloon to take up space or some other filler. Be sure to coat with petroleum jelly or silicone spray to remove.



seeem says:

Nov 6, 2008. 4:27 PM [REPLY](#)

Air, is your enemy in both alginate and the 2 plaster stages.

Alginate + plaster - you can't help put air in to, as you need to mix them both with water to start the chemical reaction.

Both alginate and plaster, you can bang in containers, to try to get the bubbles to rise (mind splashes) but one thing you can do to help your final cast immensely, is to fill the alginate mold with water, then tip the water out, gently swill a small amount of plaster around the mold, turning it upside down and everything, then carefully pour more plaster inside your mold, always tapping the mold on a surface.

Don't just pour plaster in, and think it will be ok- air is the mold makers arch enemy!!!

You can experiment with making a one peice mold, and cutting it down the middle, fill both sides then stick em together- although I reckon you'll get flash lines.

And the correct term for "Overhangs" is Undercut :)

Happy molding - make a candle :D



seeem says:

Nov 6, 2008. 4:30 PM [REPLY](#)

Oh! I forgot to say- the air bubbles, before you put the hand in the alginate, paint the awaiting mixed alginate on to the hand, THEN put it in the mix, this helps make a skin of alginate which will join the rest of the alginate in the tub.

It's not always 100% but it helps.



alhuitt says:

Sep 10, 2008. 1:53 PM [REPLY](#)

You have seen those life size plaster paris decorative hands that are made for a way of hanging your jewelry? You could make one of your own hand and give it to a friend as a gift.



guitarman63mm says:

Aug 29, 2008. 10:09 PM [REPLY](#)

I was just thinking, I'm going to make one of this, and get a small threaded rod, and stick my semi-open cast into my wall! And I shall hang my keys, or hat from it.

Stellar instructable!



rhondalicious says:

May 18, 2008. 7:25 PM [REPLY](#)

I do these, but I cast the hands in acrylic resin instead of plaster - you can get pretty much any color, and if you feel creative you can use plain clear resin and toss in glitter, sprinkles, anything interesting...



amnartist says:

Aug 10, 2008. 7:06 PM [REPLY](#)

You cast the hands in acrylic resin? Do you use the same molding material? I was wondering if the wetness of the mold messes with the resin. I cast hands and would love to do some in acrylic. Also, how do you fix all the imperfections? Some of my hands <http://www.photobucket.com/marylouart>



rhondalicious says:

Aug 11, 2008. 6:51 AM [REPLY](#)

Yeah, I've used plain old dental alginate as the mold material, and then the 2 part resin mix from the craft store. I've only ever done baby hands, but an adult hand would be pretty much the same (it would just take a LOT longer to dry).

The way I do it is to stick the hand in the mold, wait for it to set, remove the hand, and then I let the mold sit for another minute or so. Pour the liquid acrylic in, and very gently tap the bottom of the mold against the table (although if you have access to an agitator, they work really well - my father in law owns a dental lab, so I can use his agitators whenever I want. They aren't really necessary, though).

Surprisingly there aren't too many imperfections, mostly because babies pretty much only have closed fists. For adult hands, if you don't mind a frosted look, you can use a dremel with a felt bit to smooth the whole hand. If you don't mind extra work, you can also hand buff the acrylic with those 4 sided nail buffing bars. It doesn't get it as shiny as newly poured acrylic, but it looks good with colored acrylics.



amnartist says:

Aug 11, 2008. 6:06 PM [REPLY](#)


Thanks rhondalicious, great info.





=SMART= says:

Jul 3, 2008. 12:01 PM [REPLY](#)


wow, very good,
so much detail and techniques described and a fantastic outcome, a very original present :D


 **reluctant_paladin** says: Jun 4, 2008. 12:27 PM [REPLY](#)
This is one of the best Instructables I've read yet! In the lobby of Baylor Hospital in Dallas, there is a display case filled with many "life casts" of people's hands (both famous and everyday). I thought it was creepy the first time I saw it, but I think having casts of family members would be wonderful. Particularly as time passes and kids grow up/old folks pass on.
Excellent job!


 **tinker000** says: Jun 3, 2008. 6:09 PM [REPLY](#)
Another way to do this would be to use warm paraffin like that goofy warm wax arthritis thing. Just dip your hand into the wax and then cold water making sure to make the wax mold fairly thick (dipping it a few times). When you think the mold is thick enough and while it's still warm gently remove hand and allow to cool. After filling and allowing fill to harden put hand in the freezer for 1 hour. then carefully break wax away from casting.


 **curious_wanderer** says: Apr 7, 2008. 11:25 PM [REPLY](#)
A tip!for larger hands and longer arm reach (up to your elbow) use a pvc tube! just cut it in two halves vertically (with a dremmel) and then just put them together again with duct tape, and duct tape too the hole in the bottom , now your vessel is reusable! and if something goes wrong (like you cant pull out your arm) all you have to do is remove the duct tape open the tube, and remove the alginate!


 **j_larson** says: Mar 5, 2008. 6:34 AM [REPLY](#)
the poem is the best part! =>

 **Shifrin** says: Jan 13, 2008. 12:14 PM [REPLY](#)
An idea...
My father and my sister did an awesome molding project like this once, they wanted to make a billiard cue holder for themselves... they molded my fathers hand in the correct position to hold a cue and it did not turn out to well, maybe this one would work, also it would be cool to make like a cup holder, camera holder etc.
Good luck!
~ Ale Shifrin

 **Aburame Shino** says: Nov 25, 2007. 12:31 PM [REPLY](#)
Wow. Simply Marvelous. You are a great example to fathers/husbands/son-in-laws everywhere. =P Great Instructable.


 **Gnome** says: Nov 25, 2007. 8:57 AM [REPLY](#)
What an instructable! Very detailed!


 **hcold** says: Nov 21, 2007. 10:00 PM [REPLY](#)
The hand in the box of lights really freaked me out as it took me a while to see them.
Great instructable though, I'm still curious about making the mold. When the hand is taken out, is it still slightly malleable but it returns to the hand shape?

 **stienman** says: Nov 22, 2007. 4:47 PM [REPLY](#)
It is like a very thick jello - rubbery, feels wet, and is squishy and moves, but keeps its shape when there's no force.
-Adam

 **captain Jack** says: Nov 15, 2007. 5:04 PM [REPLY](#)
i like!


 **altomic** says: Aug 9, 2007. 8:36 AM [REPLY](#)
I tried to do a mold of my friends head.
see you in 25 years
18 if I am good.


 **tachikomati** says: Oct 27, 2007. 5:17 PM [REPLY](#)
Actually, a face casting isn't too hard to do. Just mix up a mould making compound kinda thick, and do the top of someones face, then have them put a straw up each nostril, and cover the bottom of their face. Lubing their face with some really greasy lotion or Vaseline is a very, *very* good idea, as well as letting your mould making material sit for a minute to reduce the cure time on it once it is on the face. I suppose the same principle applies to a whole head cast, just with a skull cap or something on, or some crazy hair oil action...


 **adidame** says: Jul 20, 2007. 7:40 PM [REPLY](#)
I am a dental student and we work with alginate and various types of stone all of the time. You can only use alginate once to get a good impression. If you would like an impression that you can pour the cast multiple times, try PVS (polyvinylsiloxane), but it is expensive. You can get the positives off of your cast with a blunt knife (they are called blebs). If you want to get the bubbles out we use a vibrating machine (and a vacuum) to vibrate them out. Using the mixer introduces air. I would use a spatula and a bowl. Ask your local dentist for a demo on how to mix, there is a sweet technique.


 **Spl1nt3rC3ll** says: Jul 9, 2007. 1:02 AM [REPLY](#)
<http://www.instructables.com/forum/TERUXT1F3SYTLW3/>

 **Spl1nt3rC3ll** says: Jul 9, 2007. 12:57 AM [REPLY](#)
These are mine, I sculpted them from clay.
<http://www.smithartwork.com/hands.html>


 **FunkLiberationFront** says: Jun 27, 2007. 2:16 PM [REPLY](#)
That picture of the girl holding the mold looks a lot like my cousin Cory.

 **CameronSS** says: Jun 21, 2007. 5:44 PM [REPLY](#)
Great attention to detail! Reminds me of when my dad poured concrete into cinderblocks around the woodstove, and my sister and I left our handprints and footprints in it (yes, with permission), which unfortunately had to stay with the house when we moved. Also reminds me or second? third? grade, when a classmate's dad, an orthodontist, came in and helped the entire class make casts of our thumbs, which were made into checkers and sold at the school auction.


 **papa-g** says: Jun 4, 2007. 9:58 PM [REPLY](#)
Very detailed instructable. Good stuff here. A lot of this applies to simple casting, so I think I will be coming back to this one in the near future.

 **royalestel** says: Jun 4, 2007. 2:17 PM [REPLY](#)
Hiding the hands in the CFL drawer is cute and clever! I'm saving that pic.

 **Zujus** says: Jun 4, 2007. 1:34 PM [REPLY](#)
Great tutorial! ;)

 **Spokehedz** says: Jun 4, 2007. 12:29 PM [REPLY](#)
A couple of things to note: A thin coating of mold release (don't use WD-40, but a veg oil would be ok) would let you re-use molds on both the hands and the positives. Also, cutting them open from one side to get the item to be molded out would let you do things that are odd-shaped like hands.

The other trick would be to use compressed air to blow air around the edges of the mold to release it more easily. the air will let the object/subject move out easily. Same with the positive, when the casting material is hard.

 **II.13** says: Jun 4, 2007. 8:43 AM [REPLY](#)
Very cool!!
