

CARBONATURE CLASSROOM



Always use an appropriate dust mask when working with Charcoal.

- Preparation of Ground Charcoal

Grinding Charcoal:

- **Garden Mulcher Method:**

- Grind the charcoal in a garden mulcher.
- Attach a seed bag around the mulcher chute and secure it to collect the ground charcoal.
- **Warning:** Step away and wear a dust particle mask while loading the mulcher. The carbon dust cloud will be intense. Stand upwind or use a fan to blow the dust away from your work area.

- **Sledge Hammer Method:**

- Use a small sledge hammer to smash the charcoal into bits in a steel or aluminum pot. Wear a dust particle mask.
- To separate the particles, use a screen. Optimal particle size is about 10 mm or ¼ inch.
- A steel mesh, like a hot food rack, works well as a large sieve.
- A large plastic bowl or container with 10-20 drill holes can also serve as a good sieve.

- **Importance of Fines:**

- The fines or dust created during the process are important as they act as a filler and binder between the larger charcoal particles.



- **Equipment Tips:**
- If you have many participants, consider borrowing or buying a garden mulcher. You can find them in second-hand stores or on FB Marketplace.

Materials or tools required: **Wear safety glasses for eye protection from the glue.**

Appropriate safety mask for charcoal dust, charcoal is Carcinogenic if breathed in.

PVA glue, preferably waterproof

Large plastic mixing bowl

Spatula

Rubber or latex gloves

Food wrap

Board or large tray for filled work

Bucket of water for cleaning up utensils or gloves

Polyvinyl acetate (PVA) is a common adhesive used in various applications. Here's some safety information about PVA:

1. *Biodegradability: PVA glue is biodegradable, which means that natural microorganisms, such as bacteria, can break it down into water, natural gases, and acetic acid. This property makes it safe for the environment.*
2. *Safety for Humans and Pets: PVA glue is safe for children and pets. It emits hazardous fumes only when burned. When used appropriately, it serves as a safe adhesive that won't harm our surroundings. (Copilot)*

(Carbonature accepts no responsibility for the products we endorse for use)

PVA glue is considered non toxic but caution should be applied with any foreign element please.

Glue Selection:

- Use waterproof PVA glue for any sculpture build. It is preferred due to its superior strength and resistance to breakdown when wet. The best option we have found is Titebond, which, although expensive, hardens to a resin-like strength.
- **Safety Precautions:**
- Always wear rubber or nitrile gloves when mixing charcoal with the PVA glue.
- **Mixing Ratio:**
- The optimal mix ratio resembles a wet porridge. If you can form the mix into a ball (like a snowball) without squeezing too hard, it should be a good mix.
- If the mixture crumbles after curing, this indicates insufficient glue was used.
- **Mixing Process:**
- Use a large stiff spatula for the initial mix to distribute the glue evenly throughout the charcoal.
- Use your gloved hands to mix the charcoal thoroughly, aiming for an even consistency. The process is similar to kneading bread, where your fingers help to evenly distribute the glue.

- **Storage Tips:** If you prepare the mix in advance, always cover it with plastic, pressing the plastic down onto the mix to expel air. The glue is activated by air and heat.
- Store the covered mix in a cool place, such as on a cement floor, away from sunlight.
- **Before Casting:**
- If you do not use the glue immediately after mixing, some glue may migrate to the bottom. Stir or mix by hand to re-wet the entire mixture before casting.
- If the wet mix can retain a ball shape in your hand this is a good indication about the right glue to charcoal ratio.



Preparing the Mold:

- Place the plaster mask into the cloth or paper nest.
- Lay food wrap into the mask as a mold release. This step is very important.
- Press the food wrap into the nose first to avoid creating a flat spot on your face.
- **Applying the Charcoal Mixture:**
- Place the first handful of charcoal into the mold and spread it evenly across the bottom. This thin layer at the nose allows you to push the mixture into the end of the nose. Apply only enough pressure to get the mix into the nose and slightly pack it in.
- Once the nose is evenly filled, start gently patting the mixture around the mouth. It's important to pack the mix into the lip area before starting up the sides of the face. Generally, use three fingers to pat the charcoal bits together.

- If the charcoal is not compressed evenly into the mold, it may not glue properly. Take your time; it's easy.
- Follow the same procedure for the eyes. Place a thin layer (approximately 20 mm or ½ inch) over the eyes and pack it against the mold evenly.

Adding Additional Layers:

- Add another layer over the entire lower portion of the mold, making it about 50 mm or 2 inches thick. Pack it into the bottom layer. Ensure the mold is not pressing down onto the table and deforming.



Filling the Sides:

- Once the bottom is packed, start filling the sides, including the cheeks, bottom of the chin, and eyebrows.
- Follow the same procedure as before with a 20 mm layer, then thicken it to 50 mm.

Filling to the Edge:

- Once you have a ¾ filled mold, it's time to fill it up to the edge.
- After adding 20 mm or ½ inch layer, press it against the wall of the mold. You can use your thumb inside the mold to squeeze it on.
- Apply the final layer and use your fist to pack it into place. Be firm but careful not to deform the mold. Check again to ensure the mold is safely surrounded by your nest.

Setting the Mold:

- A thick skin around the inside of the mold allows air and heat to set it up more quickly than if it were completely full.

Hollow Interior and Final Fixing:

- By leaving the inside hollow, you can fill it with the glue mixture after curing when fixing it into position on your chosen surface. This extra mix will fall out towards the edge of the face as you twist the face onto the surface, providing material to fill the gap between the face and the surface.

Drying the Mold:

- Once packed, place the mold in a location to dry, keeping it within the nest if possible.
- The PVA glue sets with heat and exposure to air.
- Note: Some experience handling casts will be beneficial at this stage.

- **Avoid Overfilling:**

- Do not fill your mold completely with the mixture as it will not dry thoroughly deep into the mold. Allow a hollow middle area with a wall of mixture which is about 50mm or 2 inches.

- **Removing the Sculpture:**

- When removing the sculpture from the mold, the end of the nose may still be wet with uncured glue, even with a 2-inch skin. Curing time and temperature are crucial at this stage.
- As the mixture sets on the back side of the mold, it creates a barrier to air and heat, which can slow curing.

- **Extracting the Sculpture:**

- Turn the mold over to extract the sculpture; it may fall out onto the table. If it doesn't, gently pull at the food wrap until it comes away.
- If the sculpture is stuck, it means the crease between the model's nostrils and cheek is stopping it from dropping out. Or there may be a whole in the food wrap if it was not treated properly when placed in the mold. If this is the case you have a problem to solve.
- Be cautious, as the nose is very soft with the wet glue. Excessive force can pull or flatten the nose. If the nose starts to break up, leave the food wrap in place and gently pat the nose back together.
- If the nose is very wet, heat a pin and make pin pricks around the top of the nose to allow air to continue the curing process.
- Gently pull back the food wrap from the cheek and forehead areas to allow air to set these areas.

- **Food Wrap Removal:**

- Do not leave the mask in its protective food wrap for more than about 5 days, depending on the temperature. The food wrap will stick to the charcoal glue mix if left too long, making it difficult to remove.
- If this happens, use a gas torch to burn off the small bits and pieces of food wrap after removing the bulk off the surface. The food wrap will create a dark brown residue when torched. Avoid heating to the point that the glue burns, as it will weaken the mixture.
- If damage occurs, make a mix of fine charcoal particles and apply it with a palette knife to the damaged surface.



- Image shows plaster molds filled with Charcoal encased in food wrap.



- These Charcoal Carbonature masks are the end results of this tutorial including the face molding tutorial.

- As you might see it can be difficult to recognise the model. We have found that the model always seems to know who they are.

Carbonature, Kim Perrier ©