



Glass Bead Making

Objective: The student will learn how to safely create glass beads of various colors utilizing an oxygen/propane torch, mandrels, glass rod, rake, tweezers, pick, mashers, and other assorted tools. Students will learn how to make a symmetrical round bead first. Students will then learn a variety of decorative techniques including making stringers, forming dots, reducing colors, stripes, swirls, and raking. Students will select and utilize the appropriate techniques to create beads of their own design. They will learn the reasons for annealing glass. They leave with several beads of assorted colors.



Glass Bead Making Safety

1. Always wear cotton clothes.
2. Long pants are STRONGLY recommended!
3. Keep long hair tied back.
4. Sleeves should be rolled up or wear short sleeves.
5. ALWAYS place the hot end of the glass on a tool rest when you are not using it. Make sure the hot end is pointing away from you.
6. ALWAYS place hot tools on the tool rest when you are not using them. Make sure the hot end is pointing away from you.
7. Wear glasses specifically designed for glass bead making. We use didymium glasses with side guards. They block out sodium flare and UV rays, allow the bead maker to see what he/she is doing in the flame, and prevent injuries to the eyes.
8. Wear closed-toe shoes. Leather shoes are recommended!
9. Work area should be well-ventilated.
10. Keep tools on either side of the torch - never in back of the torch.
11. NEVER REACH THROUGH THE FLAME! KEEP ALL PARTS OF YOU OUT OF THE FLAME!!!!

Supplies - per student unless noted

- 1 Nortel Major/Minor burner (torch)
- 1 pair of tweezers
- 1 bead rake
- 1 tool rest
- 1 bead masher
- 1 pair of Didymium glasses
- 1 marver
- 8 mandrels
- 3-inch x 3-inch x 1-inch piece of oil clay to hold mandrels upright
- 1 16 oz jar bead release per 64 students
- 1 heat resistant metal container half full of water
- 1 250 cc oxygen cylinder per class of 9
- 1 25 lb propane tank per 36 students
- 1 Paragon bead annealing kiln with a Sentry Express 4.0 programmable controller
- Hoses, clamps to connect torches with oxygen and propane. Oxygen and propane gauges to control pressure
- 1 bead reamer per 3 students
- 1 pair flat nose pliers
- 6 12-inch assorted color pieces of 90 COE glass rod
- 5 3-ft x 6-ft tables with heat resistant tops, chair for each student

Vocabulary

Anneal - cool the glass slowly to avoid thermal shock.

Annealing kiln - an oven/furnace used to gradually cool glass or clay.

Bead release - clay-like mixture that coats the mandrel and prevents the glass from sticking

Bench burner - torch used in glass bead making. A Minor Burner used a mixture of oxygen and propane as the fuel to heat the glass.

Didymium glasses - coated with a special filter to protect your eyes from sodium flare, infrared and ultraviolet light.

Mandrel - steel rod around which the glass is wrapped when creating a bead.

Marver - flat or textured surface made from graphite or steel used to shape hot glass.

Moretti - colored glass rod used in glass bead making. Has a relatively low melting point.

Oxygen regulator - gauge that controls the amount of oxygen flowing through the torch head.

Propane regulator - gauge that controls the amount of propane flowing through to the torch head.

Rake - pointed or tapered steel tool pulled through the hot glass to create patterns.

Tool rest - long, angle-shaped, heat-resistant piece of metal used to place hot tools and glass.

Tweezers - metal tool used to pinch or pluck pieces of glass or color from the surface of the hot glass.

A Brief History / Background of Glass Beads

Humans have been making glass beads for many thousands of years. Beads have been used a currency as well as an art form. Glass itself was devised by the Egyptians and Romans. It is made of silica sand, soda or potash, and lime. When warm, glass can be molded into all sorts of shapes, including glass beads.

Beads have been made of glass for over 5,000 years. The discovery of fire was the essential step in glass bead making. Evidence exists as early as 2340-2180 B.C. in Mesopotamia of a method known as "core-forming" where glass was melted in a hot flame onto a metal mandrel to form a bead or ornament.

These early beads were considered valuable and were preserved in burial tombs. In Nuzi (130 miles north of Baghdad) beads were discovered that date to 1400 B.C. Even today, we make beads by holding glass rods over a flame then gradually winding the molten glass over the mandrel.

Resources:

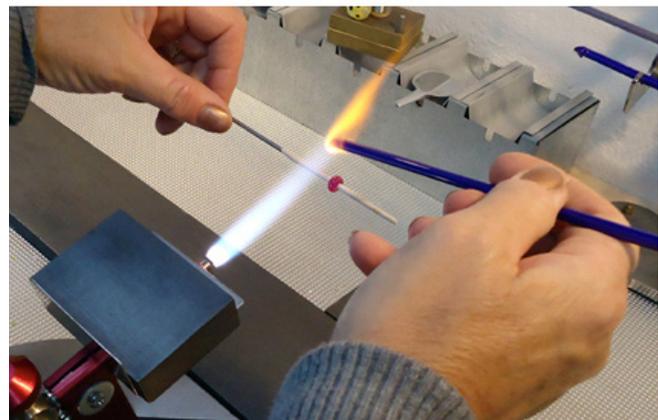
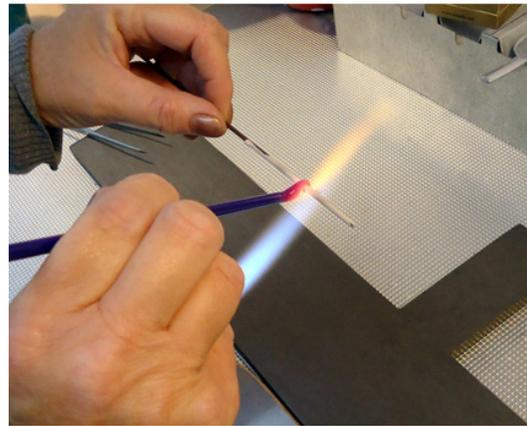
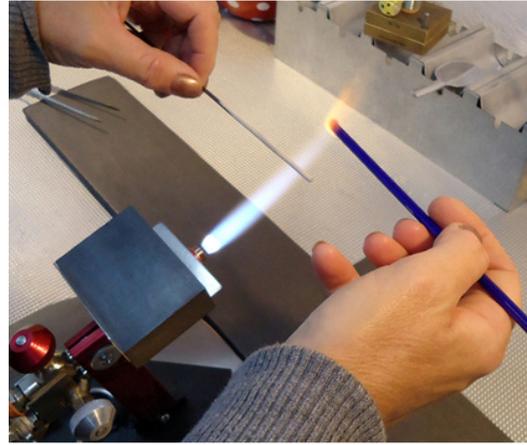
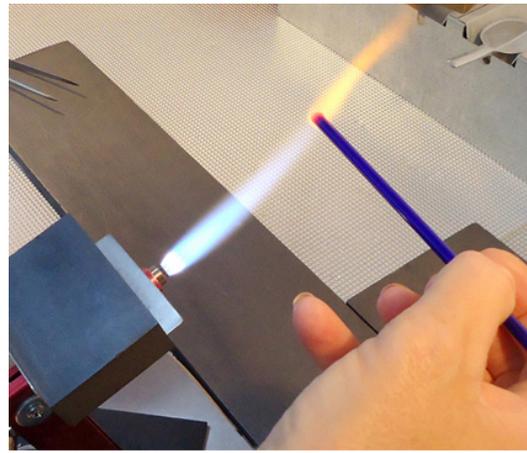
Delphi Glass - www.delphiglass.com - glass rods, bead making supplies, torches,
Mountain Glass Arts - mountainglass.com - glass rods, bead making supplies, torches,
gauges, annealers, etc.
Hobby Lobby - glass rods, limited supplies, simple start-up kits.

Directions: Forming a Bead -

Students will:

1. Heat the tip of the glass rod slowly by passing it in and out of the flame. If the rod keeps popping, try working higher in the flame or turning down the gas.
2. Leave your glass in the flame longer and longer. The rod will glow orange when it is warm enough to remain in the flame continuously. Once you see this glow, you can leave about 1/2 to 3/8 inch of the rod in the flame - keep rotating the rod so that the glass does not droop or sag off center.
3. Hold your hand slightly lower than the flame so that the hot end of the rod does not stretch. This allows the molten glass to thicken and ball up on the end.
4. When the ball of glass on the end of the rod has a consistent orange glow all the way through, start heating the coated part of your mandrel.
5. Hold the mandrel in the flame above the glowing glass ball for approximately 10 seconds. Be sure not to overheat the mandrel - it doesn't need to glow orange. Keep the glass hot at the same time.
6. Press the front end of the glowing glass ball onto the mandrel in about the middle of the bead release. Start rolling the mandrel away from you. Stay in the flame during this entire process.
7. Roll the mandrel until you have wound off as much hot glass as available on the end of the glass rod. Do not keep winding into the cold part of the rod. Stay in the flame and allow the glass to soften to that you can finish winding off as much as you wish. Keep the flame aimed at the cold rod just below the bead.
8. Keep rolling the mandrel away from you during wind off to prevent a long stringer from forming.
9. After you have wound off the molten glass, set the hot glass rod in your tool rest.
10. Round up your bead by keeping it in the flame and rotating the mandrel until the bead softens and pulls into a round shape. Keep everything level at this point to keep the bead from sagging.
11. Bring the bead out of the flame and let the glow wear off. Keep the mandrel rotating. When the glow disappears, wave the bead back and forth through the flame several times to even out the heat in the bead. When the bead begins to glow throughout, bring it out of the flame and wait for the glow to disappear.
12. Place the bead and mandrel in the annealing kiln.
13. Keep the bead in the annealer until cool.
14. When the bead is cold, remove it from the mandrel, clean out the bead release and use it to make jewelry.

Images and directions reprinted with permission from www.bigbeadlittlebead.com/



TENNESSEE
ARTS
COMMISSION
Cultivate. Create. Participate.

This Project is funded under a Grant
Contract with the State of Tennessee.