

Introduction

Introduction

The goal of this guide is to give you a basic understanding of the principles of glass cutting and instruction to begin cutting glass yourself. Cutting glass is a skill useful to both hobbyists, do-it-yourselfers, and professionals. Making stained glass windows and repairing a broken window pane all require glass to be cut. This guide will instruct you on the basics of glass cutting. These basic steps are easy to learn and can be applied to both small and large pieces of glass. It does not cover cutting laminated and tempered glass, nor industrial methods of glass cutting.

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Tools and Setup

Tools

Few tools are needed to cut glass, and the essentials are shown in the adjacent figure. All tools can be bought at hobbyist stores. These were purchased at Hobby Lobby.

NOTE : Glass cutters can be bought with either a steel or tungsten carbide wheel, but I recommend the later. A tungsten carbide wheel will cost slightly more but will greatly increase the lifespan of the cutter.

Setup and Workspace

A flat cutting surface is necessary. It should be as large or larger than the piece of glass to be cut. Anything that can scratch or apply pressure to the underside of the glass must be removed from the table surface before the glass is placed on it.

A waste basket will be needed to dispose of glass shards that will break off.

An ideal workspace is well lit from many angles. This will reduce shadows making it easier to see the line you are cutting.

Safety

Working with glass has its dangers, but most are avoided with common sense. Glass gloves will protect your hands from being cut. These can be bought at most hardware stores for about 12\$ and are essential when working with large heavy pieces of glass. For hobbyists, gloves are not always necessary, but they will protect you from being cut.

When moving large sheets of glass, use a suction cup or two, and two people may be needed to maneuver the glass.

Clean up all shards of glass that break off and dispose of them in a box, this will prevent any tears in garbage bags. Break down any large pieces of glass before disposal.

Essential Glass Cutting Tools

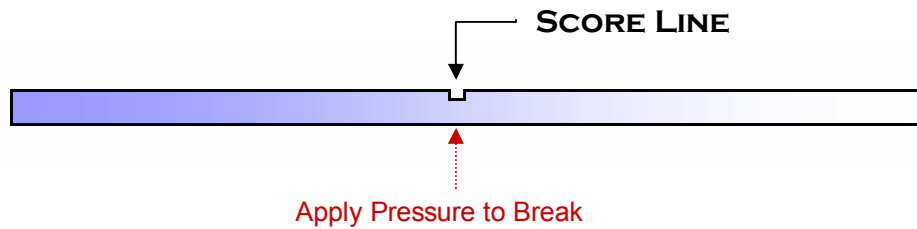


Dealing with Glass

Glass Properties

Cutting glass is much different than cutting wood or paper. Glass has no grain—it is actually classified as a very hard liquid—so the direction of the cut does not matter. It is also very brittle and easy to shatter so it can not be cut with a saw or scissors.

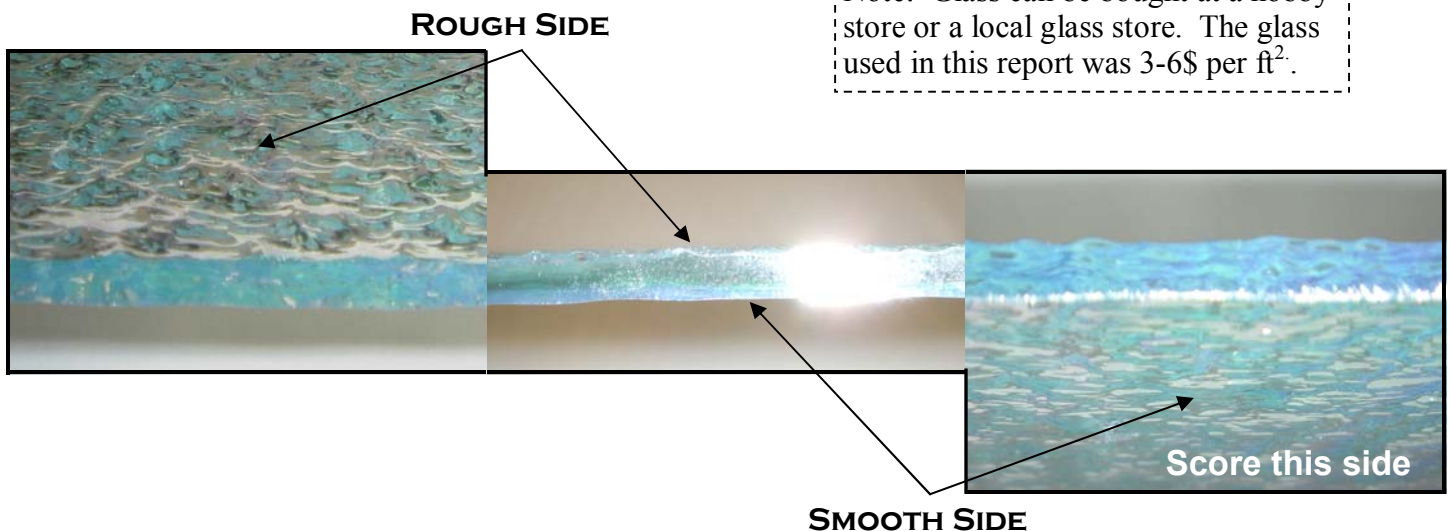
The wheel of the glass cutter scores the glass—a score is the furrow that the glass cutter makes as you press the wheel across the surface of the glass. When pressure is applied beneath the score line, the glass will break along that line.



Surfaces

Most glass is smooth on both sides—plate glass. However, if you are cutting textured glass, first feel both sides of the glass and determine which is smoother. This is the side that you will score.

A side by side look at Textured Glass

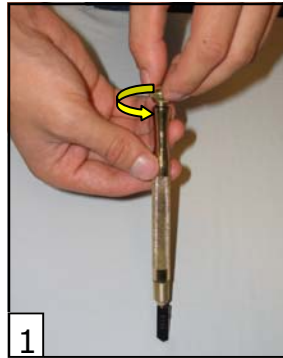


Straight Cuts - Scoring

Filling the Glass Cutter with Oil

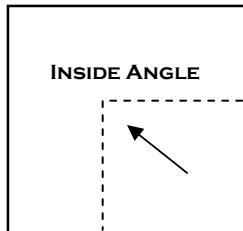
Using an oil fed cutter will keep your cutter sharper longer, which will lead to cleaner cuts. The oil lubricates the wheel as it scores the glass and protects the cutting wheel from abrasion. See Figures 1 and 2 for a visual demonstration.

- Unscrew the back end of the glass cutter, this opens the oil reservoir.
- Fill the glass cutter with oil and screw the cap back on.



Scoring the Glass

Straight cuts work best when the score is made from edge to edge, it is not wise to try and cut an inside angle into the glass with a glass cutter. Inside angled cuts require drilling and these instructions do not cover it.



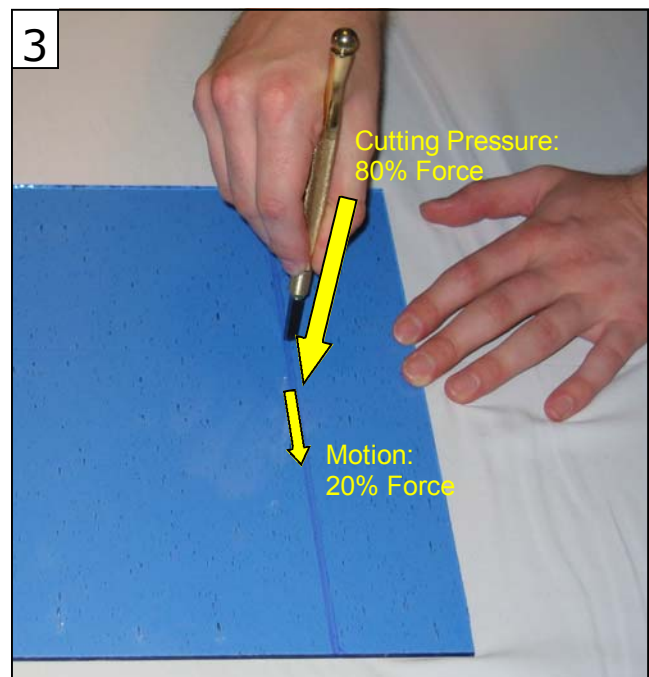
It is important to have a consistent speed and force while cutting the glass. About 80% of the force will be pressed into the glass creating the score with the cutting wheel. The other 20% of force should push the wheel along the line—see Figure 3.

NEVER STOP a score once it has been started—this will cause an inconsistent score line and can cause the glass to shatter or break poorly at that point.

- Trace line to be scored with a dry erase marker.
- Grip the glass cutter like a pencil.
- Place the wheel at the edge of the glass.
- Score along the line with an even force and speed until the other edge is reached.
- A tearing sound should be heard while scoring.

Note : This sound will probably not occur when scoring opaque glass.

**CAUTION: Glass edges are sharp!
Glass gloves are recommended**

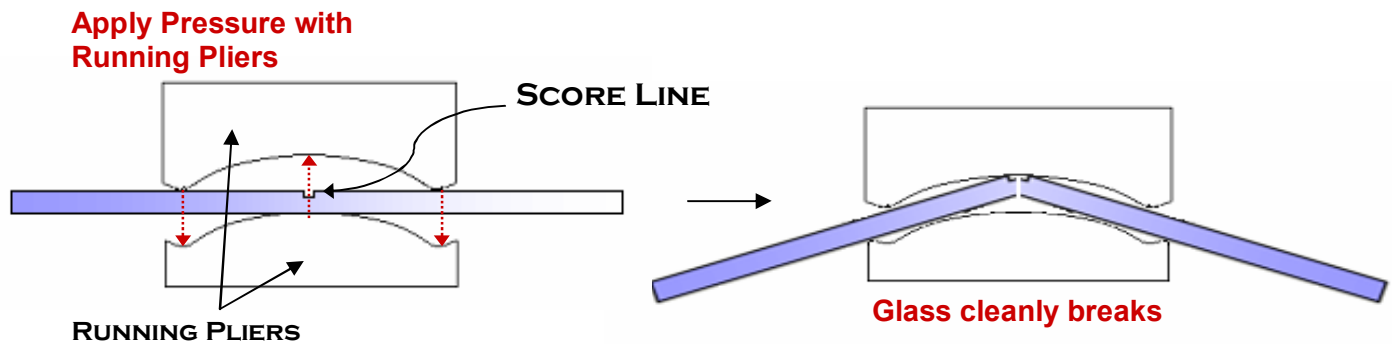


Straight Cuts - Breaking

Using Running Pliers

A run is the separation or “cut” that occurs when pressure causes the glass to break along the score line.

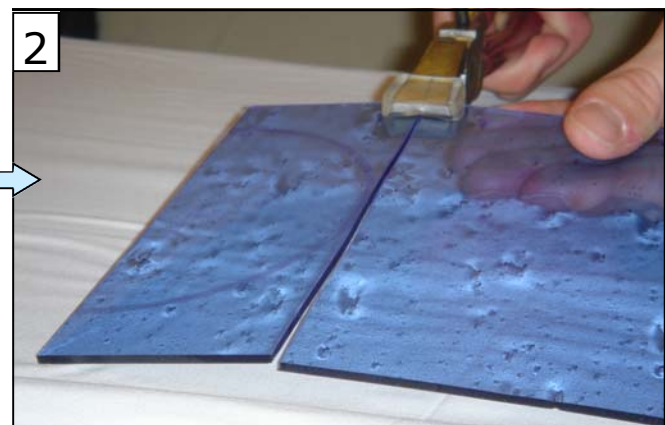
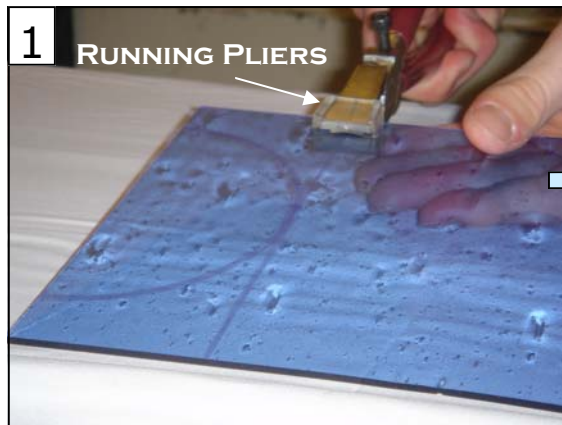
Running pliers evenly apply pressure to the score line giving a quick and clean break. They are best used for straight cuts and for starting long, gradually curving cuts. See the figures below for a visual explanation.



Breaking the Glass along a Straight Score Line

The best way to break a straight cut is with running pliers—see Figures 1 and 2.

- Place the concave side of the pliers head directly over the score line.
- Slowly apply pressure with the pliers until the glass breaks along the score line.
- Straight cuts are usually very clean but sweep any shards of glass created by the break into the trash before setting the glass down to avoid scratches.



Basic Curves - Cutting

Scoring the Glass

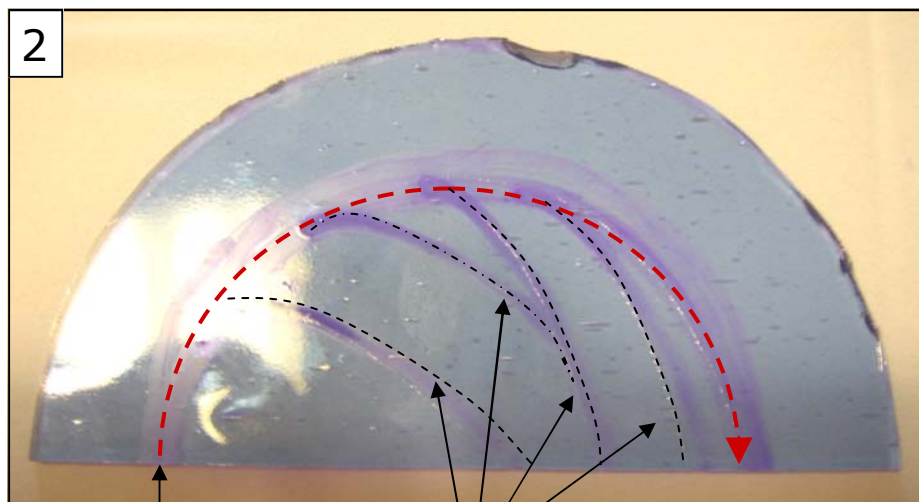
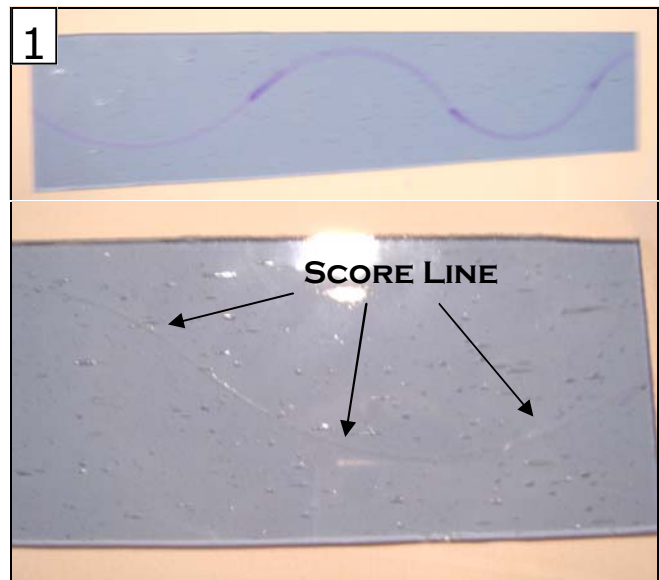
When scoring a curve the cutter will resist turning so move slower and pay close attention. Remember not to stop the cut—even if the cut goes slightly off of the line.

There is usually some room for error when cutting glass as the edges will most likely be covered by some sort of lead or framing metal.

If planning to cut an inside curve—see Figure 2. Draw relief lines into the piece being cut out, and cut the relief lines after the main score line has been made. The relief lines should flow off of the main line, so that if the glass does break off of the main score line, it will more likely run into the portion of glass to be discarded.

Planning and Scoring a Curve

- Trace line to be scored with a dry erase marker.
- If planning an inside curve, relief lines should be drawn—see Figure 2.
- Score the main line first.
- Maintain consistent pressure and speed with the same pressure as you would use for a straight cut.
- Cut with an even force and speed until the other edge is reached.
- Cut relief lines if necessary and stop them on the main score line.



MAIN SCORE LINE
BEGINS HERE

RELIEF LINES

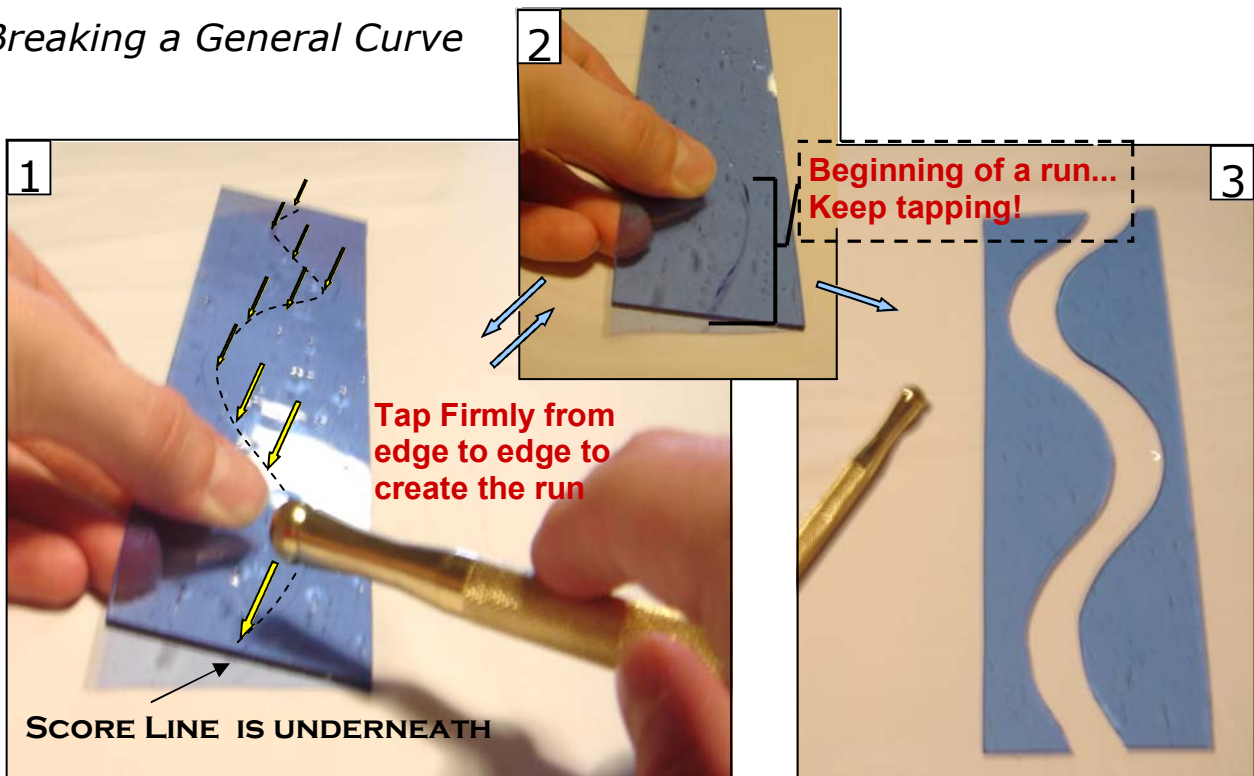
Basic Curves - Breaking

Breaking the Glass along a Curved Score Line

When breaking a curve, it is best to create the run by tapping on the underside of the glass with the brass end of the glass cutter.

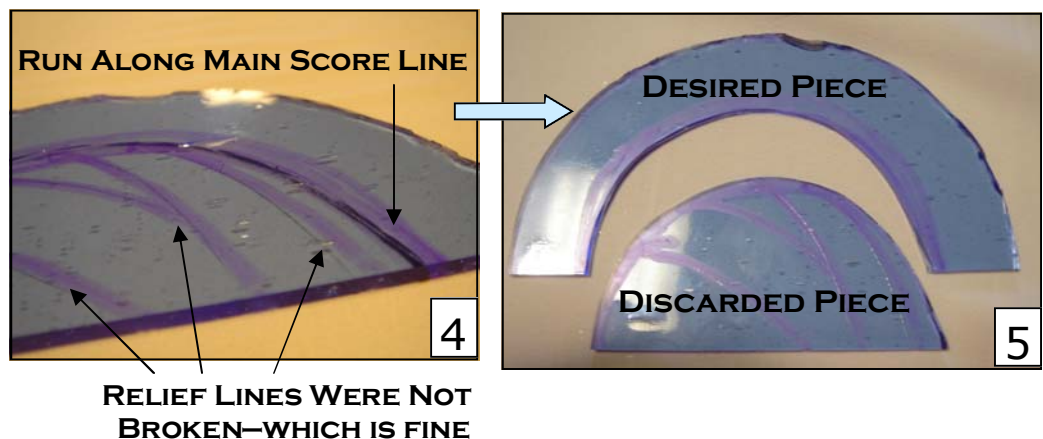
First flip the glass so that the score line is underneath and hold it securely. Begin tapping firmly on the top of the glass above the score line until a run is started—see Figures 1 and 2. Continue tapping along the score line until the run reaches both edges of the glass. It should then break and the two pieces will separate.

Breaking a General Curve



Breaking an Inside Curve

Follow the same procedure as breaking a general curve, but if any relief lines run, follow them to the edge of the glass until that piece breaks off and then begin tapping on the main score line again.

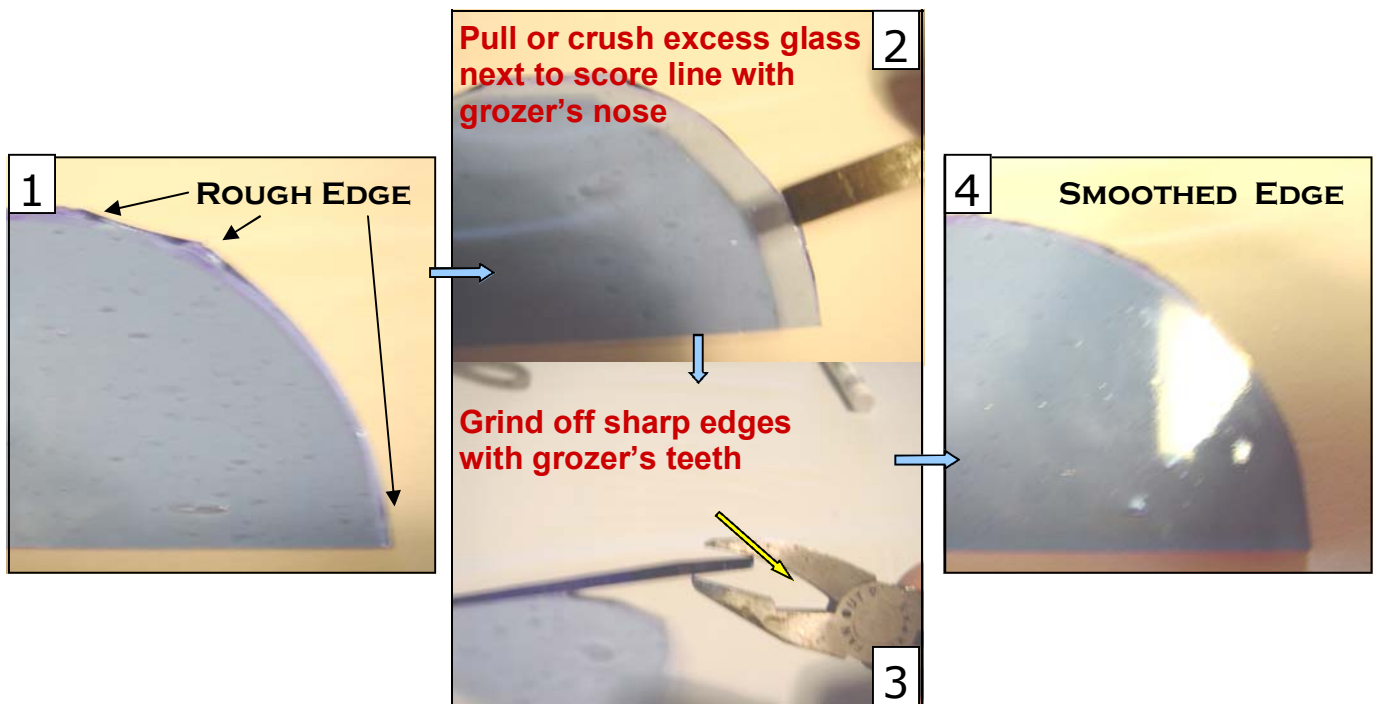


Basic Curves - Grozing

Smoothing the edges using grozing pliers

Rough edges and small leftover chunks of glass along the score line will frequently occur when cutting curves—see Figure 1. Grozing pliers—grozers—are used to remove unwanted glass and create a smooth edge—see Figure 4.

- To remove small chunks of glass next to the score line, grip the leftover glass with the grozers and try and break it off. If the piece does not break off try crushing it—see Figure 2.
- Grind any leftover rough or sharp edge with the teeth of the grozers until they are smooth or the glass is removed up to the desired score line—see Figure 3.
- Clean work area of any glass shards created by grozing.

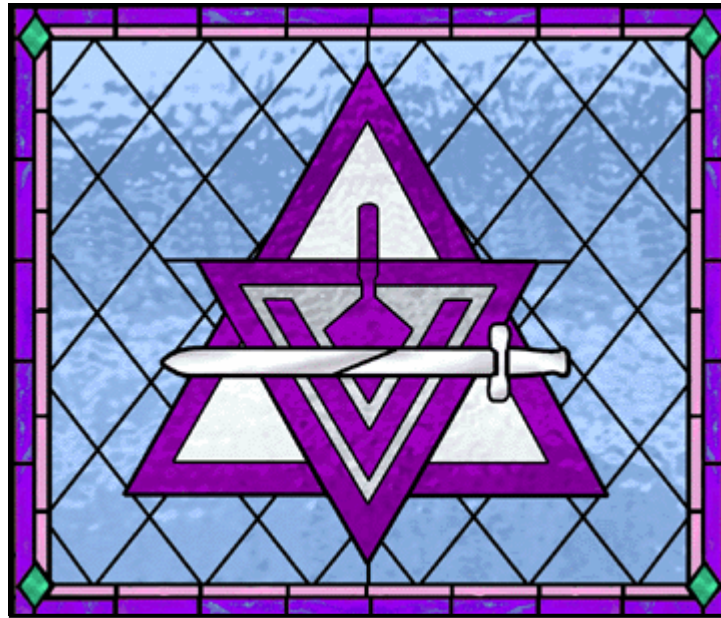


Your glass is now ready to be used. Take care in handling the finished piece and good luck in whatever project it is for.

Conclusion

Glass cutting is an easy skill to learn but there are many aspects of this skill that can only be mastered by experience. Many hobbyist glass shops offer classes in stained glass which cover the skills needed to cut glass well. Now its time to go get some supplies and plan your next project involving glass—knowing that you have the skills to get the job done.

How To



Cut Glass

A guide of the best methods for scoring and breaking both straight and curved cuts in plate and textured glass.