Instructions:
How to Teach Glass Cutting Skills

Use this exercise to practice and learn proper glass cutting techniques.

Materials:

Item #	Description
M3901	Double Strength Clear Glass - medium pieces (cut into ½ sheet per student)
5100	Pistol Grip Super Cutter *or*
5104	Dry Wheel Super Cutter
5066	Breaker/Grozer Pliers
5068	Running Pliers
5163	Safety Glasses

Hand Tools - Emphasize how and when to use each hand tool.

Cutters

Show the different kinds of cutters available and encourage students to try each kind before purchasing one. Discuss some of the differences in the cutters. Any of the pencil grips require finger strength. The pistol grip uses more hand strength. Point out that cutter heads are made to move. The movement allows the student to feel the curve that may be on the glass.

Running Pliers

Spend time looking at the tools before using them. First the running pliers, ask the students to look at the running pliers and tell you what they notice. They have coated tips that are used on glass. These tips are important to successful breaking of the glass. There is a small screw on the topside. This has to be adjusted to the thickness of the glass. Each type of glass varies in thickness.

To determine the setting for the glass, put the piece of glass in the pliers. Carefully, turn the screw until the end of the screw touches the inside of the other handle and then back off 1/4 turn. Check the setting each time you change the type of glass being cut. Looking straight at the end of the pliers, you can see that they curve down. When using the running pliers, the screw must be facing up. The pliers have a center mark that must be lined up with the score. It should look like the score continues up on the pliers. Apply light pressure to the glass. The score will start to run and then break apart. Emphasize

that glass does not like to be "strong-armed." The student will be more successful if he or she is gentle.

Breaker/Grozer Pliers

Notice the jaws of the pliers are different. One jaw is flat and the other is curved. This difference allows for the pliers to be used in two ways. Curved jaw on top: the grozing jaw and is used to nibble away at the edge of the glass. This is useful when a little burr or shard protrudes on the edge of your glass. Flat jaw on top: the breaking jaw is used to "break" or "snap" the glass at the score line. By positioning the flat jaw near the score line and holding the other side with your hand, break the glass using a downward motion.

Scoring and Cutting Glass

Don't focus on making straight cuts. Allow the students to become familiar with the tools and how they work. When choosing which side of the glass to make the score, look for the shiny side. If there is no shiny side, choose the smooth side. When making a score, the wheel should be perpendicular to the glass. Three to five (3 – 5) pounds of pressure are needed to score the glass. When the tip is pushed, that is all the pressure that is needed. A score should look like a strand of hair – not grains of sand. You are only required to break the surface tension. When the surface tension is broken, then the glass will run.

Provide the student with a very simple pattern. A practice sheet is attached.

Using the Practice Sheet

Start the score at the edge of the piece of glass and stop at another edge of the glass. Do not stop in the middle of a piece of glass or make a score that turns a corner. Allow students to attempt to make the first score (#1 on the practice sheet). This score divides the glass into 1/3 on one side and 2/3 on the other side. Set the large piece to the side. They have now used the cutter and the running pliers. Running pliers can be used when ¾ of the tip will fit on the glass.

Allow student to attempt to make the second score (#2 on the practice sheet). Show them that the running pliers do not fit on the glass. Then demonstrate the use of the breaker/grozers. Tell them to place the breaker/grozers next to the score, but not on it. Then gently apply slight downward pressure as they move the breaker/grozers from one end of the score to the other. Show them how they should be dropping their elbow slightly as they use the breaker/grozers. Tell them that as the run continues, it will break off. They may have to apply the breaker/grozers several times before the glass breaks.

Explain to them that glass likes to break straight. You can coax it to make gentle curves.

Notice that there is about ¾" from the top and bottom edge. That adds support to the score. Allow students to attempt to make the third score (#3 on the practice sheet). Tell them to apply light pressure to one end. When they hear a crack, turn and go to the other end of the score and do the same thing. As the two runs meet, the glass will break. Explain to them that the longer the score, the more important it is to apply gentle pressure to one end and then to the other. It may be necessary to go back and forth a few times. Allow student to do another score the same way by scoring #4 on the practice sheet.

Allow students to score #5. Explain to them that this is the hardest break to achieve. What is important to remember is that inside curves are done first and they should put as much glass as possible around it for support and strength. Using the practice sheet, show them that there is about ¾" to 1" on each side of the curve at the bottom of the glass. There is about 5" above the score. That is the secret…strength on three sides. Tell them that they will have to stand to make the score. When they stand, they have the ability to shift their body weight to make the score in one continuous motion. Have them do an imaginary score in front of them to see if they have the room to complete the score. Then make the actual score. Using the running pliers, apply gentle pressure to the score. When they hear a crack, go to the other end and do the same thing. Be gentle. Go back and forth and it will come out. To show your students another method of making inside curves, direct them to score #6. It is preferable that they have a rectangular shape. Show them how to make small arches and use the breakers to pull it out. Apply the breakers next to the score (not on it) and pull. Pull straight out from in front of you to the side of you. You have to try this. I am successful if I pull an arch that is less than ¼" at the top.

Cutting Practice Sheet