The Morton System
Don't Do Glass Without It!
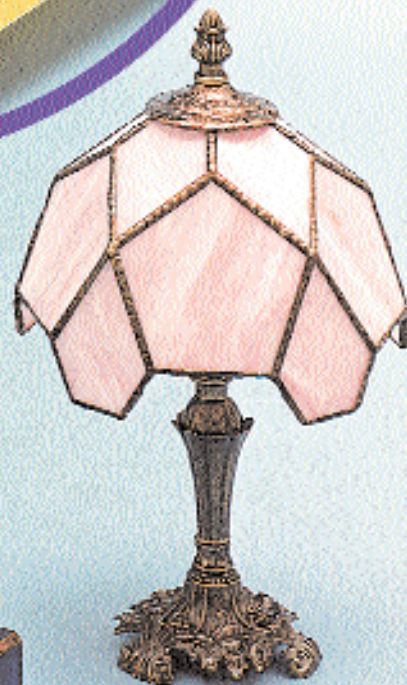
Eight projects with step-by step instructions included.

GS Assembly Tray *(PG05)*

Holds the angle for tack soldering.

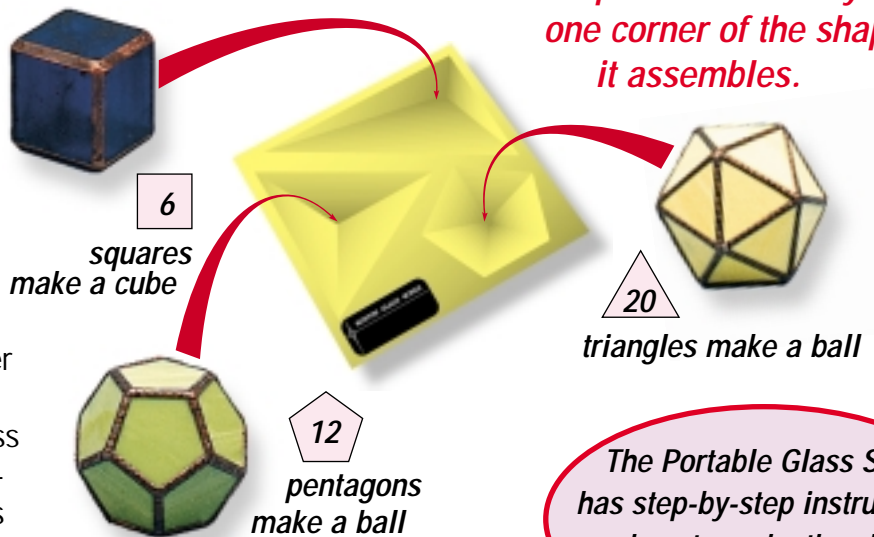Suggested Retail **$19.**^{95}

GS Assembly Tray
user instructions

The three basic geometric shapes and their many variations are assembled in the tray by aligning corners rather than sides. With the triangle and pentagon shapes you need only the tray's pocket for alignment... with the cube you will need spacer rods. The *spacer rods are important*... the diameter of the spacer is determined by the thickness of the glass... the spacers position the three glass pieces so only the inside edges are touching... this perfect alignment of the corners insures a perfectly aligned cube or jewelry box. Spacer rods are not included with the tray because thickness varies and the spacers must be the same as the thickness of the glass.
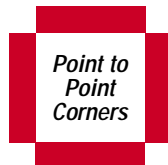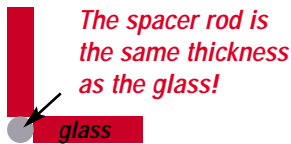
The spacer rod is the same thickness as the glass!
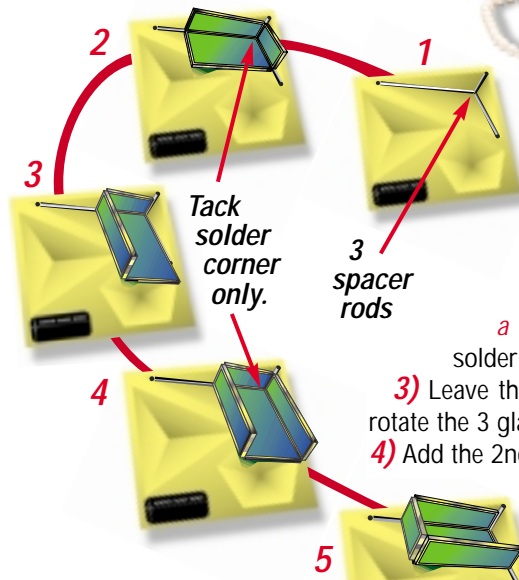
glass

Point to Point Corners

Square Corner…

Six squares make a cube... but *because glass has thickness*, to make the cube, you must align all inside edges of each square to the square it touches. We call this a *point-to-point* corner and it is the best corner for making jewelry boxes. Spacers can be wood, paper or metal. Just about anything will work if it is round and the same size as the foiled glass is thick. A few examples are wood shish kebab sticks, electrical wire *with the plastic coating left on* or coat hanger wire and masking tape wrapped to glass size.

Paperweight Cube

1) Make 6 squares from a 1¾″ glass strip *(glass with refective or iridescent surface is a good choice)*.

2) Assemble 5 foiled squares into a box *(use the jewelry box steps as your assembly example)*.

3) Remove the cube from the tray and rough solder the inside of the cube.

4) Fill the cube with dry silica sand *(make the sand level with the top of the cube)*.

5) Add the 6th square to the cube *(rough solder around the entire square to seal the sand in)*.

6) Finish soldering your cube *(the sand will make soldering the cube easy and is a great way to practice your soldering techniques)*.

6 squares make a cube

Each pocket of the tray forms one corner of the shape it assembles.

20 triangles make a ball

12 pentagons make a ball

The Portable Glass Shop has step-by-step instructions on how to make the shapes used in the projects.

Jewelry Box

Our jewelry box bottom is a 3⅝″ by 7″ rectangle... 2 ends are 1″ by 3⅝″... 2 sides are 1″ by 7″... the top is 4″ by 7⅜″.

Tack solder corner only.

3 spacer rods

1) Place 3 spacer rods in the tray. *(size equal to the foiled glass thickness)*.

2) Place the bottom into tray *(rods space it away from the tray's sides)*... add a side and end *(you now have a point-to-point corner)*. Tack solder the corner *(use small tack)*.

3) Leave the spacer rods as they are and rotate the 3 glass pieces.

4) Add the 2nd side... tack solder the corner.

5) Rotate the 4 glass pieces *(leave wires in the starting position)*.

Tack solder corner only.

6) Add the 2nd end piece and tack solder the corner.

7) Leaving the spacer rods in the starting position... rotate the box and tack solder the corner.

Important: After tack soldering the last corner, remove the box from the tray. *DO NOT FINISH SOLDER IN THE TRAY!*

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Pentagon Corner...

12 pentagons can be joined to make a ball. The twelve faced ball (*dodecahedron)* has twenty corners. The tray aligns the pentagons to be joined in the same manner as the square corner. **Note:** *Spacers are not needed with the pentagon corner.*

Tack solder corner.

Small tacks allow movement and make the next corner easier to line up.

Keep adding pentagons until you have one left!

Add the 5th pentagon by shifting the 4 pentagons to the side and tack solder.

Add the 4th pentagon by shifting the 3 pentagons to the side and tack solder.

IMPORTANT: *The tray is not used to add the 12th pentagon... DO NOT use the tray for finish soldering!*

As you add more pentagons tack all corners of three before adding more pentagons.

Pentagon Ball

Candle Dish

Make 11

Make 5
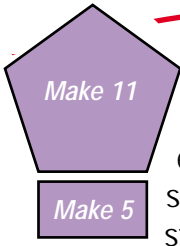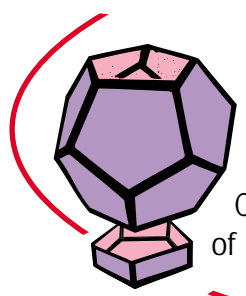
The candle dish is only a small modification of the pentagon ball. Cut eleven pentagons... we started with 2¼″ wide strips of textured cathedral glass to make the 2″ high pentagons. Cut 5 rectangles... we used a 1″ wide strip of opalescent glass *(make the rectangles length match a pentagon side)*. Start the assembly by first making the ball from 10 of the 11 pentagons... *leave out the bottom pentagon...* next make a cup from the remaining pentagon and five rectangles... finish soldering inside the cup before attaching it to the ball.

Base Cup
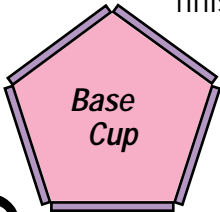
Hanging Planter

Select a glass that is translucent and reflective *(iridescent glass works well)*... the 2¾″ pentagons are made from a 3″ strip... the 3 triangles are made from the 4th pentagon... the trapezoids are made from a 6″ wide strip *(base size same as pentagon... top size is ¼″)*... the wire hook was made by twisting two #14 copper wires together.
1) Start the assembly by connecting the 3 pentagons and 3 triangles... *IMPORTANT:* **Tray not used for remaining steps.**
2) Use masking tape to hold the 3 trapezoids and hook in place for tack soldering. **3)** Finish soldering the planter. **4)** Decorate the planter with silk flowers.
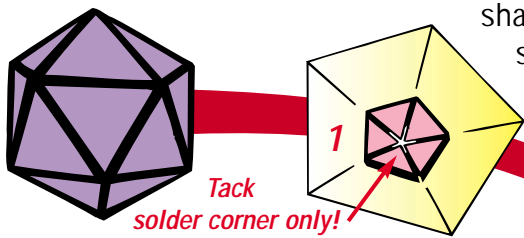
Make 3

Make 4

2
3
1

2
3
1
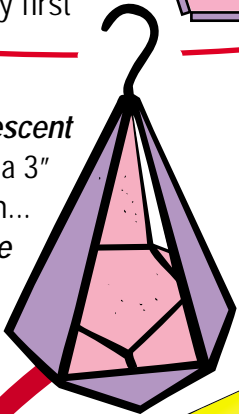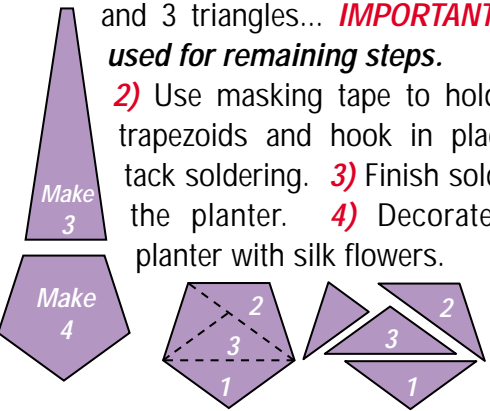
Add the 3rd triangle... *remove the pentagons from the tray... attach the 3 trapezoids.*

Tack solder corner only!

DO NOT use the tray for finish soldering!

3

Triangle Corner

The tray positions five equal triangles to make one corner of the icosahedron *(20 -triangle shape)*. There are ten of these corners that make up the 20-triangle ball. The equal triangle has three equal sides and your Glass Shop instructions will show you how to make this shape from glass strips. The ball and the pencil

Tack solder corner only!

1) Align 5 copper foiled triangles in the tray *(no spacer wires needed)*. Tack solder the five points together *(a small tack is best)*.

2) Shift the 5 pieces from step 1 so you can add 3 more triangles and tack solder the points as in step 1.

3) Shift the 8 pieces and add 3 more triangles... tack solder.

4) Shift the 11 pieces and add 3 more triangles... tack solder.

5) Shift the 14 pieces so you can add the 15th triangle... tack solder as before *(your shape should now look like step 6)*.

6) Remove the 15 pieces from the tray and complete any soldering needed on the inside of the ball.

7a) Repeat step 1 with the 5 remaining triangles.

7b) Align the 5 trapezoids in the tray and make a small solder tack at all 5 joints.

8a) Fit the top to the body and tack solder.

8b) Remove the trapezoid ring from the tray and set it on your work surface... from a hardware store buy 6 #16 brass plated finishing washers... arrange the washers *(be sure they are upside down)* inside the trapezoid ring and tack them in place *(finish soldering anything on the inside before fitting the ring to the body)*.

9b) Fit the top to the body and tack solder.

Triangle Ball

holder are the same except for the modification of the five triangles in the final step. For the ball, make 20 equal triangles *(we started with 1¾" wide strips of glass)*. For the pencil holder make 15 triangles of one color *(we started with 2" wide strips of glass)*. Using the same setup on the Glass Shop, make 5 more triangles using a narrower glass strip *(we used a ⅝" wide strip of glass of a different color)*... because of the narrower strips the 5 pieces will be trapezoids with the same angle and base size of the 15 triangles.
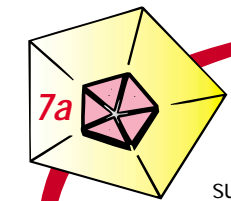
Pentagon Lamp

Make 10 "A" pieces from 2-inch strips by first making 10 diamonds using a 60° angle... next convert the diamonds to irregular pentagons using the hexagon setup on the Glass Shop... make just one score and you will have the "A" piece *(save the triangle scrap)*. From a 3¾-inch strip make the 5 "B" pentagons... make the sides of the pentagon the same as the long side of the "A" piece. Copper foil the 15 glass pieces... use narrow foil for narrow solder joints.
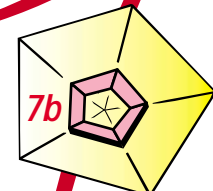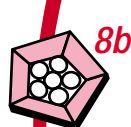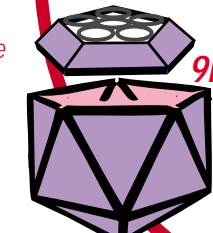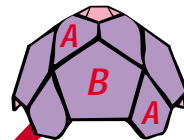
1) Place 5 non-foiled scrap triangles in the tray.

2) Place 5 of the "A" pieces in the tray *(triangles act as spacers)*. Solder pieces together to make a starting ring.
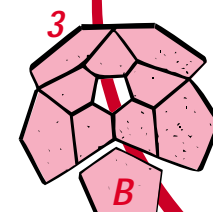
3) Remove ring from the tray... with "B" piece flat on table, tip the ring to the "B" piece... match the "A" pieces to the "B" piece... tack solder... repeat for all "B" pieces.

4) With "A" piece flat on the table... tip the shade until the "B" pieces match the "A" piece... tack solder... repeat for all "A" pieces.
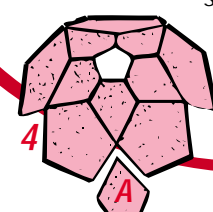
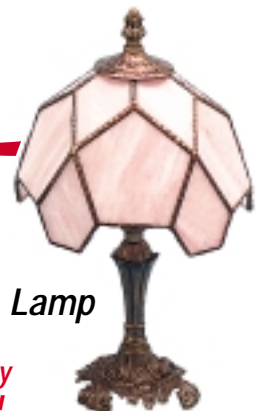**5)** Add the vase cap and finish soldering the shade.

Pencil Holder
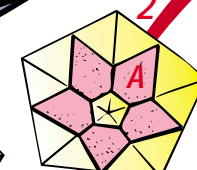
Pentagon Lamp

DO NOT use the tray for finish soldering!