

# Sun Catchers

By: Berit Johnston



Nasir Al-Mulk Mosque; Shiraz, Iran 19th century

This project is inspired by the beauty and mystique of an **Ancient Craft** that is truly timeless. Creating stained glass is a complicated and intricate skill and art form that embodies the **Middle Ages**, yet has origins even **older in the Middle East**. Using the sun's light, stained glass illuminates images from **religious motifs, geometry, nature and daily life scenes**.

Stained glass uses this natural source, **THE SUN**, to bring life to dark interior spaces. Despite periods in which it fell out of popularity and was even **destroyed**, Modern, Geometric Stained Glass is making a glorious comeback in modern design.

What is Stained Glass and how is it made?

Stained Glass is a form of Line Art/Design using lead tracks to secure intricate patterns of colored glass.

Stained glass begins with a "**cartoon**" or line drawing which serves as the blueprint. Glass is blown into cylinders, then scored, and molded into flat sheets. Metal oxides added to sand during the melting process color the glass.

The sheets are  $\frac{1}{8}$ " thin and hot tools were used to score and cut the glass to fit the shapes on the line drawings. Then, the glass panels are painted for details and sometimes silver oxide is brushed on. The glass is then fired in a kiln to adhere the paint into an enamel coating. The silver oxide is wiped off staining the glass with a tint in the range of lemon yellow to amber orange, and is where the term "stained glass" came from. After all the pieces are fired, the artist

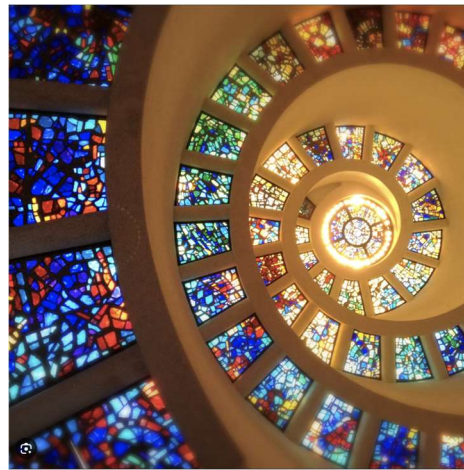
will assemble them like a puzzle using strips of lead called “comes”. The comes have an H shaped channel in which the glass fits.



Once the puzzle is assembled, the joints are soldered together and any gaps are filled with an *\*epoxy like substance\** (cement) and then coated in chalk to make the windows airtight.



The process for making stained glass remarkably has stayed relatively the same over 1,000s of years. Some modern advances have been made in tools, such as using diamond blades to cut the glass shapes instead of heated scoring tools.



Thanks-Giving Square (Dallas, Texas) 1977

## HISTORY OF STAINED GLASS

### Earliest records of stained glass

Many histories of stained glass begin with Pliny’s tale of the accidental discovery of glass by Phoenician sailors. The legend recounts shipwrecked sailors who set their cooking pots on blocks of natron (soda) from their cargo then built a fire under it on the beach. In the morning, the fire’s heat had melted the sand and soda mixture. The resultant mass had cooled and hardened into glass. Today, though, it is thought that Pliny — though energetic in collecting material — was not very scientifically reliable.

It is more likely that Egyptian or Mesopotamian potters accidentally discovered glass when firing their vessels. The earliest known manmade glass is in the form of Egyptian beads from between 2750 and 2625 BC. Artisans made these beads by winding a thin string of molten glass around a removable clay core.

In the first century AD, the Romans glazed glass into windows. One of the oldest known examples of multiple pieces of colored glass used in a window was unearthed at St. Paul's Monastery in Jarrow, England, founded in 686 AD.



"Oldest piece of stained glass"

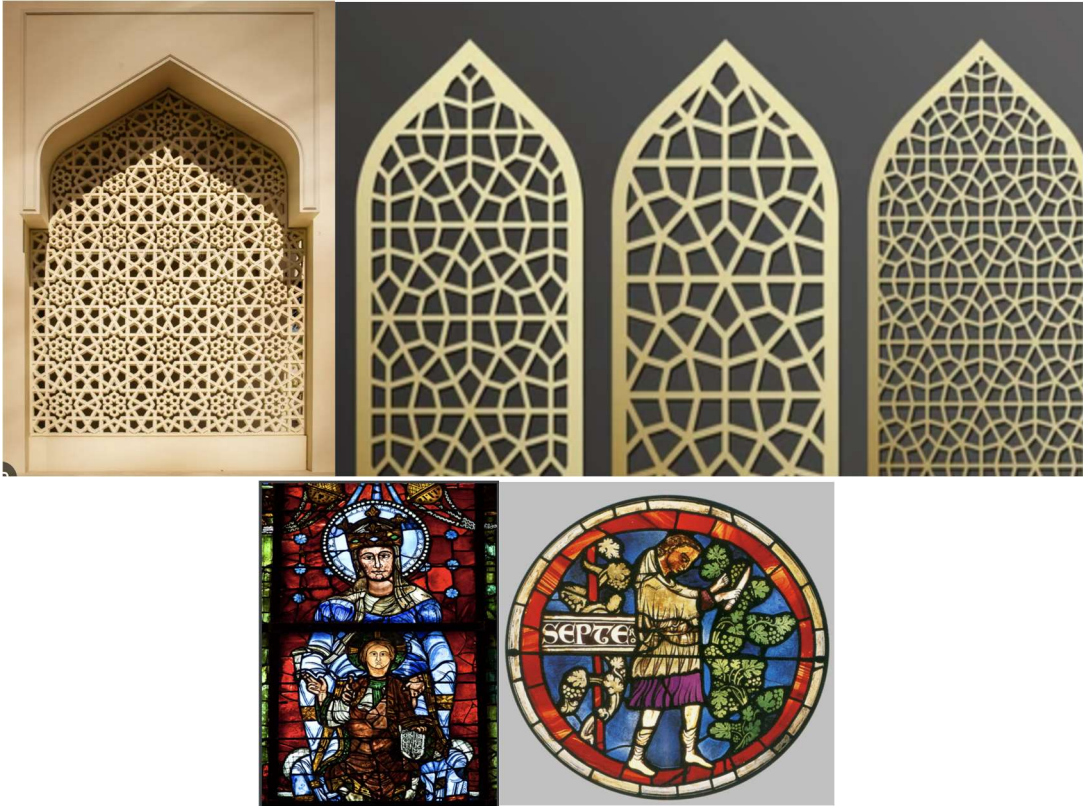


### **The Inspiration for Stained Glass**

Arabian filigree, intricately carved wooden windows, moved into Europe when the Moors entered Spain. As the fashion moved farther north into colder areas, covering became necessary. This covering first came in the form of slices of alabaster, but later small pieces of glass were attached using lead.

Arabian glass windows likely didn't appear until the second half of the thirteenth century.

Stained glass is a beautiful example of merging Eastern and Western Culture dating back centuries.



(Left Romanesque Cathedral of Bishop Fulbert of Chartres, France, Right Swiss 1170 Cathedral Lausanne)

**Middle Ages:**

Stained glass popularity, prevalence and detail grew during the Gothic period, expanding from simple figures to complex iconography. Guilds of workmen formed traveling studios. Grand architecture and religious icon imagery became popular during this time when the church held immense wealth and power over the common man. Churches with colorful stained glass became a place of light and beauty to escape the drudgery and darkness of daily life. Architectural advancements including buttresses allowed for windows to grow to a massive scale in these structures. This was definitely the defining style period most associated with stained glass



Unknown, Troyes Cathedral, Chartres Cathedral, Sainte-Chapelle

### Renaissance:

Stained glass was used in secular (non-religious) buildings during the Renaissance period. Historic scenes were placed in town halls and small panels (usually silver stain and paint on white glass) were incorporated into clear glass windows in homes. The labors of the seasons are a favorite theme during this period.

The way stained glass craftsmen worked also changed. Artists drew cartoons on paper and were able to carry those cartoons to different clients. Sample books of patterns were also transported. Finished windows were shipped to customers at a distance. Studios joined together in corporations or guilds. While religious themes were still present, images more often reflected fashion of the day.



17th, 18th century

## The Low Ebb

Stained glass reached a low ebb sometime between the late medieval age and the nineteenth century. Why did stained glass fall from favor? The new Protestants were hostile to elaborate art and decoration.

By 1640 colored glass was very scarce. This necessitated painting on white glass with enamels. The little decorative glass that was produced was mostly small panels for city halls and private homes. Stained glass that had been so popular just a few years before was no longer in demand. The glass craftsmen were in great misery, pushing their wheelbarrows from place to place in search of work.

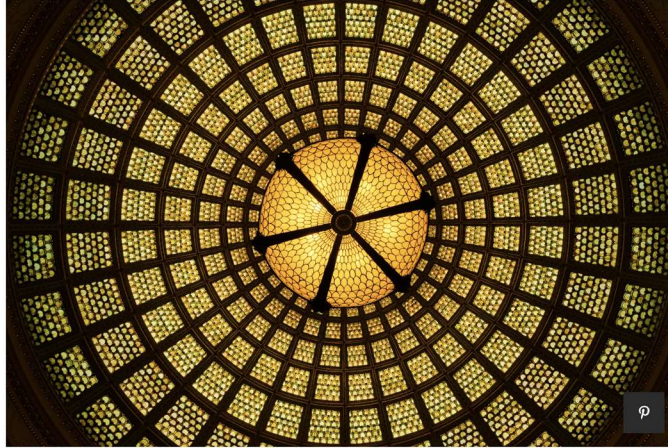
The Puritans were so fervent in their views that they smashed much of the existing stained glass windows. (Some fragments of early glass remain in higher tracteries, as they could not be easily reached.) The cost of replacing stained glass with clear glass finally stopped the destruction.

### Featured Artist: Tiffany Glass in America late 1800's early 1900's

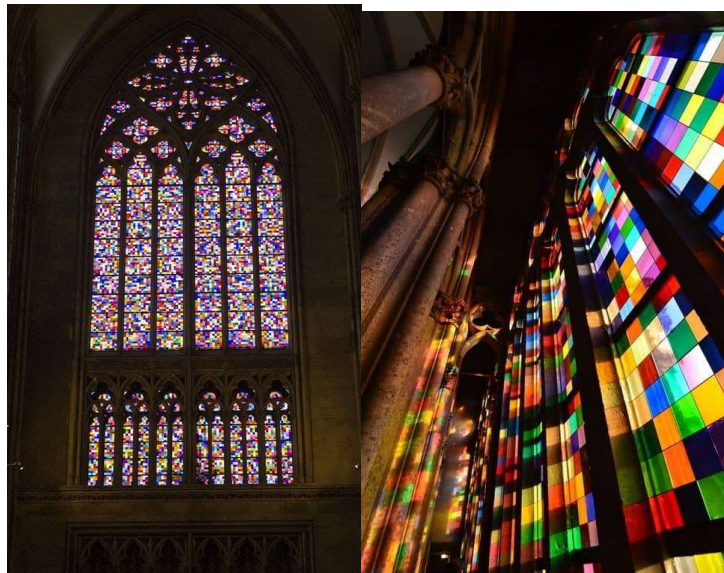


**Louis C. Tiffany** was an American Artist and painter. He was the son of Charles Lewis Tiffany, of Tiffany & Co. Jewelers. His travels and exposure to stained glass abroad inspired him to go into design. His commissions for Mark Twain, Cornelius Vanderbilt and the White House under President Arthur earned him an international reputation and great success. Many of these designs included stained glass. The first Tiffany lamp is said to have been produced and exhibited in 1893. A **Tiffany lamp** has a lead came glass shade designed by Louis Comfort Tiffany or colleagues and are considered part of the **Art Nouveau movement**.

The principal characteristic of the Art Nouveau style is its sinuous line. The principal subject is nature, whether stylized or realistic. These lamps fell out of fashion before being rediscovered and coveted by art collectors in the 1950s. Today they represent an important piece of American Modern stained glass history.



The Louis Comfort Tiffany dome at the Chicago Cultural Center measures 38 feet in diameter, making it one of the largest stained glass domes in the world. Held together by an ornate cast-iron frame that features some 30,000 pieces of glass shaped like fish scales, the dome was finished in 1897.



German artist Gerhard Richter (man without a brush), Cologne Cathedral 1932

The artist accidentally placed a template for a gothic window commission on top of one of his color grid paintings inspiring him to fill these windows with approximately 11,500 little squares in 72 colors in a pattern determined by a mathematical formula.

References: <https://www.stainedglass.org/learning-resources/history-stained-glass>  
<https://magazine.artland.com/11-artists-who-worked-with-stained-glass/>  
[https://www.wga.hu/html\\_m/zgothic/stained/12c/2/09rounde.html](https://www.wga.hu/html_m/zgothic/stained/12c/2/09rounde.html)  
<https://www.architecturaldigest.com/gallery/beautiful-stained-glass-windows>  
<https://www.tiffanyshades.com/history-tiffany-lamps.html>



Sagrada Família, Gaudi, Barcelona



### **Sun Catchers:**

Materials:

5x7 Sheet of Acrylic

.75 oz of Black Air Dry Clay (slightly larger than a ping pong ball)

12-20 pieces of Colored Glass in various shapes

15" of string

Suction cup to take home



#### Step 1:

Trace the 5x7 sheet of acrylic on a piece of scratch paper. Remove plastic backing from both sides of acrylic and set acrylic aside. Arrange approximately 15 pieces of glass inside the rectangle on the sheet of paper. Leave a small gap between each piece for the “Lead Comes” which will be represented by the Air Dry Clay. Like fitting together a puzzle.

(If you are not using a piece of glass place it back in the center. Use gloves for this step and remove once glass is selected)

#### Step 2:

Slide the paper aside, and begin rolling some clay into 2-3 snakes approximately ¼” thick about the length of a pencil. These will be our Comes. Measure one of these comes the length of the shorter 5” edge of the acrylic and break it off. Flatten the rolled clay, place the end of the string down the center of the flattened clay and fold the clay to contain the string. Remold into a snake.

#### Step 3:

Place the rolled clay with string inside along the 5” left edge of the acrylic sheet. Leave the end of the string free for now. Then, place a 7” clay roll along the top edge of the acrylic. You will begin working left to right and top to bottom.

#### Step 4:

Next locate the glass on your scratch paper at the top left. press the left and top edges of the first glass piece into and slightly underneath the clay CAME border. Line each remaining edge of the glass with a ¼” rolled CAME, pressing the air dry clay into the glass to create the H-channel shape that will secure the glass into place. Begin transferring each piece from the paper design to the acrylic sheet. Lining each edge after you place each piece of glass.

\*Be careful not to smooch the clay flat onto the acrylic sheet, keep the ¼” roll thin and tidy so only the edges of the glass are covered by the clay.

Step 5:

Continue to work left to right, top to bottom, rolling out more black air dry clay into ¼” snakes as needed.

Step 6:

When you get to the right 5” edge of the acrylic sheet, roll the other end of the string into the opposite border to create a loop at the top of the piece for hanging.

Step 7:

Finally, if there are any small gaps around your glass, pull off tiny balls of clay and fill in these gaps, (this mimics the process of using plaster to make the windows airtight.)

\*\*Do not lift the project by the string until dry

### Glossary of Terms:

**Cartoon:** a sketch or drawing. This term came from Italian “cartone” meaning paper. Early cartoons served as blueprints for stained glass.

**Came:** lead strips with an H profile creating a channel for the glass to sit in

**Cement:** waterproofing compound for filling in cracks

**Enamel:** opaque colored paint made of powdered glass than can be baked onto glass pieces

**Kiln Firing:** placing painted glass pieces into a large very hot oven called a kiln to fuse the enamel paint into the glass.

**Glass:** mixture of silica (sand), ash, soda, lime, and metal oxides for color which are melted at high temperatures and then cooled quickly

**Glazier:** installer of glass windows

**Grozing:** chipping away and shaping glass pieces using grozing players or in old times a notched iron rod

**Jewel:** a faceted piece of glass which can be inlaid in a stained glass window

**Lead:** soft malleable metal used between panels of glass. Lead dust is poisonous to inhale and lead poisoning can cause joint pain, kidney disease, nausea, vomiting, memory loss and extreme fatigue

**Rose window:** wheel-shaped window divided into a radial wheel or floral pattern.

**Solder:** mixture of lead and tin melted with a soldering iron to join the ends of each came

**Silver stain:** glass paint composed of silver nitrate. When fired it stains the glass a shade of lemon yellow to orange. This is where stained glass gets its name.

# Element Art Studio, Los Angeles Stained Glass Workshop

