VII. Glass Mosaic
Tiffany began experimenting with mosaics in the early 1870s. The glass pieces used for mosaics, often about one-quarter-inch square, are called tesserae and are cut from sheets of colored glass.

1) Sample panel, c. 1925
   Geometric
   Glass mosaic
   (76-011)

2) Top to bottom:
   Tea stand, c. 1901
   Dragonfly
   Glass mosaic, bronze
   Designer: Clara Driscoll, 1861–1944
   Marks: TIFFANY STUDIOS / D1128
   (85-010)

   Assorted tesserae from Tiffany Studios,
   1902–10
   Glass
   (Education Collection)
I. Leaded-glass Lampshades

The creation of a leaded-glass lampshade began with a color sketch on paper of the lamp design. Next, using pencil, watercolor, and paint, an artist copied the design onto a plaster form in the shape of the shade so that it could be assessed as a three-dimensional object. The design was finally inscribed on a wooden form. Templates for each individual piece of glass that made up the shade were created using the design on this mold, and the leaded-glass shade was assembled on it.

Standardization and bottom-line concerns governed lamp production. Often the templates were fashioned out of brass, which lasted longer than other materials and could be used multiple times in filling orders for the same lampshade design. When beginning the shade’s assembly, a brass ring was placed on top of the wood mold to create an aperture. The artisan then wrapped selected glass pieces—each cut using the brass patterns—in copper foil and positioned them on the mold with small nails. Starting at the top and working down, glass pieces were soldered first to the aperture ring and then one by one to each other. When this process was finished, the shade was removed from the mold and turned upside down to add a rim to the bottom edge and stabilize the shape. The shade was then soldered on the inside and beaded on the outside. Beading is a heavier application of solder to smooth and round out the line and to protect the copper-foiled edges. After soldering, the shade was patinated to change the color of the solder lines.

The ledger in this exhibition—which lists weekly fees paid to staff in the Women’s Glass Cutting Department—illustrates the careful attention to financial detail.

1) Modern leaded-glass lamp fabrication display, 2003
Susan Greenbaum, New York

2) Restoration footage for Black-eyed Susan electrolier, 2005
Venturella Studios, New York City
Sean Eno, videographer

3) “Supervision-General Work-Practice,” 1905–6
Tiffany Studios ledger, pages 200–201
(1999-063)

4) Tiffany Girls on the roof of Tiffany Studios, c. 1904–5
(2009-012:001)

THE WOMEN’S GLASS CUTTING DEPARTMENT

The design and production of lampshades was primarily accomplished within the Women’s Glass Cutting Department. Tiffany established the department at his studio in 1892, allowing women for the first time to cut and select glass for windows and mosaics along with the men. Tiffany employed six women at his glasshouse in Corona, New York, in 1892. By 1897, Tiffany had between forty and fifty women employed in his glass workshop, who were known as “the Tiffany Girls.” Clara Driscoll (1861–1944), supervisor of the department, designed many lampshades, including the popular Dragonfly & Water shade that was awarded a medal at the 1900 Paris world’s fair. Women were respected for their color sense and ability to cut glass for the most intricate patterns.
II. Blown Glass

Glassblowing is a team activity that employs the talents of many artisans. Typically, a supervisor known as a *gaffer* manages a group of five to seven people who comprise one *shop*.

To create a blown-glass object, glass ingredients must first be heated to a molten state of 2,400 degrees Fahrenheit. These are the next steps:

**Shaping:** An artisan collects a gob of the hot, liquified glass, known as a *gather*, from the working furnace on the end of a metal *blowpipe*, a hollow rod, usually five feet long. The molten glass is blown, rolled, pulled, and manipulated with various tools into the shape desired. During this phase, the object is taken frequently to a reheating furnace commonly referred to as a *glory hole*.

**Finishing:** The shaped object is transferred from the blowpipe to a *pontil*, a long, solid metal rod, for additional sculpting and added details.

**Cooling:** The completed glass object must be placed in an *annealing oven* to cool gradually over time. If glass objects are not annealed, they will crack or break.

1) **Left to right:**

**Vase, c. 1903**
Carnation
Blown glass
Marks: 9542A / L.C.T. (U-035)
On its base, this vessel shows the mark (the round, shiny area in the center) left by the pontil. The number within the pontil mark is the Morse Museum’s identifying accession number. The initials L.C.T. are etched on the left-hand side of the pontil mark. The number 9542A, a unique production number that is helpful in dating this object, is at the bottom of the pontil mark.

**Vase, c. 1905**
Lily
Blown glass
Marks: 5851B
Paper label: 61 (93-002)
This vessel was most likely created in two parts. The stemmed vessel and the foot would have been joined together while hot.

**Vase, c. 1899**
Pansy
Blown glass
Marks: L.C.T. / T1146 (U-012)
This vase exhibits extensive manipulation with a variety of tools. Notice the round bottom, pulled body and neck, and flared rim.

**Vase, c. 1906–13**
Trumpet flower
Blown glass, bronze
Marks on glass: L.C.T.
Marks on base: TIFFANY STUDIOS / NEW YORK / 1043 (54-009)
This vase features colors that may have been applied with frit or glass rods.

**Flower holder, c. 1906–24**
No. 712, Hexagon design base; 1-in. tube insert
Blown glass, bronze
Marks on glass: L.C.T.
Marks on base: TIFFANY STUDIOS / NEW YORK / 712 (54-004)
Bases and blown-glass vessels were sold in a variety of pairings, which provided many different styles and price points for the same type of vase.

2) **Glassblowing Tools**

These tools are modern examples similar to those that would have been used at Tiffany’s companies.

**Blowpipe:** Used to create the approximate mass and the general design of the object being developed.

**Casting Ladle:** Used to transfer hot glass into a cast.

**Duck Bill Shears:** Used to cut glass and often to trim and shape a piece.

**Jordan Jacks:** Used to shape glass as well as to open a glass vessel.

**Paddle:** Used to shape glass.

**Pontil:** Used after the blowpipe for further shaping and finishing touches.

**Tongs:** Used to take items from the pontil to the annealing oven.
III. Opalescent Glass
The glass made at Tiffany Studios was called opalescent glass. It was radically different from pot metal, a type of glass commonly used in Tiffany's era. Pot metal was uniformly colored, translucent, and regular in every way. Craftspeople making pot metal windows often painted them with enamels—a glass paste—to create form and visual effects.

By contrast, opalescent glass was fabulously varied in color and texture—even within a single piece of glass. By careful selection, Tiffany could use his glass to mimic foliage, fabric, water, or a sunlit horizon.

Tiffany, in a sense, was painting with glass, as opposed to painting on glass. He applied for and received patents for his modifications and improvements upon opalescent glass, although John La Farge (1835–1910) first patented the underlying process in 1879.

Tiffany created the word Favrile to suggest the handmade quality of the objects. The term was derived from the word “fabricate” to suggest the underlying process in 1879.

Bycarefulselection,Tiffany could use his glass to mimic foliage, fabric, water, or a sunlit horizon.

To create the cloth-like drapery glass (DG) artisans used hand tools to move and twist hot glass into folds.

Confetti glass (CG) was made by pouring molten glass on top of pieces of colored glass or by sprinkling pieces of colored glass into hot glass. Some of these terms for glass types are merely descriptive and were not necessarily used by Tiffany.

IV. Leaded-Glass Windows
The creation of a Tiffany leaded-glass window began with a small sketch or drawing that was followed by a cartoon, a full-scale painting of the proposed window. (See the cartoon for Yale University’s Education window in the Museum’s lobby.) Then the designer made two cutlines—tracings of the cartoon on which the planned glass cuts were carefully marked in thick black line. The first cutline served as the pattern for the window. The second was cut into templates to be used to produce the many individual glass shapes and sizes required by the pattern. Next, glass for the window design was chosen from stored sheets available in thousands of colors and textures. Once all of the glass for the window was selected and cut, the window was put together in one of two ways:

Leaded-glass technique: Artisans fit the cut glass into flexible lead cames, which are strips of lead shaped like construction “I-beams.” The glass pieces are placed on either side of the “I” and soldered and mitered at the joints.

Copper-foil technique: Lead cames were difficult to use for complex patterns requiring many small glass pieces. For these projects, especially the leaded-glass lampshades, artisans wrapped the edges of glass pieces with a thin copper foil before they were laid out and soldered together. This copper foil was treated with beeswax on one side and muriatic acid on the other. The beeswax permitted the foil to adhere to the glass, while the muriatic acid permitted solder to bond to the foil.

1) Modern window-making techniques display, 2005
Melody Spence, designer
Visions in Stained Glass Inc., Orlando
Left: Leaded glass
Right: Copper-foiled glass

V. Glass Chemistry
Silica (most commonly sand), soda or potash, and lime are the three primary ingredients of glass. When mixed, these raw materials form what artisans refer to as batch. Color is created in various ways, but often by adding either metallic oxides to the batch or various ready-made forms of colored glass during other stages of the glassmaking process.

1) Left to right:
Compote, c. 1913
Blown glass
Marks: 2272 H / L.C. Tiffany – Favrile
(52-007)
Louis Comfort Tiffany (1848–1933) began his work in glass with the same tools and ingredients that had been used by artisans for thousands of years before him. Tiffany took the science of glassmaking, however, and elevated it to an art form of new brilliance and beauty. Under his watch, teams of talented designers and craftspersons translated Tiffany’s all-encompassing vision into some of the most memorable glass creations of our time. Tiffany’s studio system was not a simple enterprise; he needed specialized employees—a hierarchy of artists and artisans—to accomplish his goals.

This exhibition addresses the processes that Tiffany’s many companies used to produce everything from glass mosaics and molded buttons to leaded-glass lamps and windows.

Unless otherwise noted, all objects were designed by Louis Comfort Tiffany or one of his artists and made under the name of one of his companies.