



GEOMETRY AND NATURE: DESIGNS IN GLASS

Images + Art Activities

(High School)

CONCEPT: Frank Lloyd Wright designed many striking art glass windows and doors for his Prairie School houses. These designs were very geometric in shape and often were based upon shapes Wright found in nature. (The idea of representing botanic shapes with geometry can be traced throughout architectural history to the writings of Viollet-le-Duc. Many American architects admired his work and used his ideas.) After Wright designed a window pattern, it was outlined with zinc or lead strips and then colored and clear glass were added. Sunlight shining through the leaded glass windows gave interior rooms a beautiful, ever changing glow. Wright designed a particular pattern for each house, and then used that repeated design (central theme or motif) throughout the house.

TO THE TEACHER: The images of art glass from the slide packet or CD "Wright Art Glass" should be shown to students before the creative activity. Take time to explore and discuss each design with your class, encouraging them to look for the method Wright used for geometric abstraction of botanic shapes.

MATERIALS NEEDED:

Images from Slides or CD "Wright Art Glass"
Slide projector and carousel or computer with CD drive
Yardstick or pointer
Newsprint for sketching
White construction paper
Colored markers
Rulers
Pencils
Masking tape
1 piece of rectangular recycled glass per student
White glue
Watercolor or heated crayon shavings to dye the glue
Modeling clay
(Optional Activity - acrylic paints)
(Optional Activity 2 - soap and poster paint)

PROCEDURE:

1. Show the following images to the students and discuss each design. Students should be encouraged to sketch and identify the designs they see.

Image 1: F.L. Wright Home and Studio, 1889-1911. Frank Lloyd Wright designed this art glass window for the ceiling of the main entry to his studio/office. The window fits beneath an artificially lit skylight.

Point out the major shapes and patterns used to create the design. How is repetition of color and shape used to create symmetry?

Image 2: "Tree of Life" Window, Darwin D. Martin House, Buffalo, New York, 1904. This famous design shows Wright's desire to create light screens for his homes, letting sunlight in but preserving the privacy of his clients without resorting to using draperies. The window design is a geometric abstraction of the shape of a tree. Explore the way Wright used line to create this design.

Image 3: Bradley House, Kankakee, Illinois, 1900. Compare this window to the "Tree of Life" in the previous image. How well does the design screen the occupants for privacy? The Bradley house is located on the banks of a river and surrounded by trees. Do you think the setting might have influenced Frank Lloyd Wright's decision not to use colored glass? What other reasons might have affected Wright's decision to use clear glass? (Economic, client choice?)

ART GLASS WINDOWS AT THE DANA-THOMAS HOUSE:

[Frank Lloyd Wright designed the art glass in the Dana-Thomas house using two basic motifs - the Sumac plant found on the Illinois prairie and the butterfly, a favorite of the Dana family. The Linden Glass Company of Chicago was responsible for executing the art glass to fit Frank Lloyd Wright's design for this house.]

Images 4-5: Sumac Window, Dana-Thomas House, Dining Room, Springfield, Illinois, 1902-04. This window is based on the design of a Sumac tree. The glass in the window is shiny and metallic looking on the outside, but inside the colors are warm and mellow. The abstract sumac pattern is found throughout the Dana-Thomas house. Discuss the color scheme chosen for the house. Examine the glass pattern from the outside. Notice the iridescent quality of the glass. (Iridescence refers to the play of light creating a rainbow of colors.)

Images 6-7: Entry Transom Above Arched Door. The entryway to the Dana-Thomas house is in the shape of an arch. Surrounding the doorway are abstract butterfly shapes. There is evidence of butterfly designs on the fireplace of the original Lawrence house, but they are realistic. Why did Wright choose to abstract the design this family requested?

Image 8: Reception Area Glass Near Fireplace. Several sets of art glass windows and doors are located on the side of the reception hall.

Imagine how the colors of the glass affect the lighting in the interior space when the sun is shining brightly.

Images 9-10: Hallway Doors, Reflections. Frank Lloyd Wright wanted his interior spaces to flow together rather than dividing the rooms into little boxes that were common in Victorian houses. He used art glass doors to separate his spaces.

Image 11: Dining Room, Bookcase. These glass doors are located on the front of bookcases. Notice the simplistic representation of the butterfly shape.

Image 12: Art Glass, Master Bedroom. A large leaded glass window provides a spectacular backdrop for Susan Dana's bedroom. Look carefully at the pattern in the glass. Is it symmetrical or asymmetrical? Is the design balanced on the window? What effect would this window have if Frank Lloyd Wright had chosen primary colors for the design?

2. Frank Lloyd Wright designed art glass in his Prairie School houses using a central motif. In this lesson students will be designing a motif for the glass in a home and then executing it in model form.

Direct the students to study their sketches of the Wright art glass they viewed in the images, then ask them to make preliminary sketches of geometric designs of their own creation that are based on natural shapes. (You may wish to display a variety of house plants around the room during this period.)

3. Once the students have decided on a basic design, they should transfer the sketch to a piece of construction paper, using rulers and measuring the shapes so they can be repeated exactly. The students should use colored markers to indicate the areas of color to represent colored art glass. Reinforce the concepts of symmetry, repetition and contrast in your directions.

4. Ask the students to submit their final sketch to you for approval, then have them follow this procedure:

- Carefully tape the edges of a recycled pane of glass. Then build up the edges of the glass with masking tape to make a tray approximately 1 in. high. (This will prevent the glue mixture from running off the glass.)

- Using modeling clay, recreate the lines of the drawing representing the lead.

- Mix white glue and watercolor (or heat crayon shavings & mix to give more pliable consistency).

- Pour a thin layer of the colored glue in appropriate sections of the design. Work on one color at a time. Let the colored sections dry.

- Carefully remove the clay one small section at a time and replace with glue dyed black. Let set and work on another section on a different part of the design. (This will be a slow process, and you may wish to combine this activity with another art activity, completing it over a period of time.)

- When all the clay has been removed and the infill black glue is dry, remove the tape build-up on the sides. Display the glass. (Some teachers treat the glass to keep the glue from adhering before this activity. Then they have the students carefully remove their glue windows from the glass pane after they are dried so they are self-standing.)

EXTENSION #1 (Optional Activity): Students can create their designs on the glass panes using acrylic paint.

EXTENSION #2 (Optional Activity): Have the class choose one or two student designs to represent the motif of the classroom. Let the teams of students draw the design on the classroom window using soap for outlining - then apply masking tape along the lines. Repeat the motif on another window. Have the students use poster paint to paint the colors of the design. When the paint is dry, remove the tape and carefully paint this space with black paint.