

Dear Educator,

Thank you for booking a tour with the Museum of Glass. We look forward to your visit!

We're sending you this curriculum to help enhance the museum visit for you and your students. These activities have been carefully prepared to go with the exhibit you will visit. You can use them as pre-visit materials or post-visit, but we strongly encourage that you spend some time with the packet before your visit. We've found that students understand and learn so much more if they are prepared before they come.

Along with this packet, we have extensive curriculum and interactive activities on our website about glassblowing and working with hot glass as an art form. Please visit www.museumofglass.org and click "**Learn**" on our home page. From there, visit the **Virtual Hot Shop**, where your students will get a chance to experience glassblowing by creating a *macchia*. Participants walk through the process step-by-step until they get a finished work of art! Along the way they can also choose to learn more about glass. You and your students can even watch the Hot Shop Live, by clicking "**Watch**" on our home page and selecting the "**Live Web Streaming of the Hot Shop**" link.

We sincerely hope you enjoy these materials and your visit to the Museum of Glass.

***The Inner Light: Sculpture by
Stanislav Libensky' and Jaroslava Brychtová
(Inaugural Exhibition)***

July 6 - October 27, 2002

Lessons:

Transparent Geometry: Finding Math in Art

Mathematics Essential Learning 1.3 Geometric Sense: describes and classifies
3-5 figures

Dynamic Collaboration: Form and Message

Communications Essential Learning 3.2: Works cooperatively as a member of
a group

Casting Light: Making Optic Sculpture

Arts Essential Learning 1.1: Applies knowledge and skills: creates sculptural
forms

Transparent Geometry Finding Math in Art

Teaching Process: School Educator

- Introduces Libensky´ and Brychtová Glass sculpture, Cube in Cube
- Assists students in writing inventory of geometric shapes and relationships seen in sculpture
- Guides students in documenting observation with mathematical diagrams, and assumptions about form made from observation.
- Facilitates discussion of how the qualities of transparency affect geometric form
- *Materials: Ruler, protractor*

Learning Process: Students

View example sculpture by Stanislav Libensky´ and Jaroslava Brychtová.

The artists considered some of their work to be “geometrical, mathematical pieces.” 3-dimensional inner math shapes are surrounded by outer math shapes. The transparent volumes of shapes within shapes create an inner light. Jaroslava Brychtová said “I think that there is spirituality in high mathematics” (2001).

Analyze image through observation, estimation and inductive reasoning: identify and diagram examples of:

- *geometric shapes*
- *faces*
- *angles*
- *perpendicular*
- *parallel*
- *vertices*
- *vertex*
- *congruency*
- *symmetry*

Present Findings based on observation of sculpture. Students self-asses for description/diagram of defining attributes of 3-dimensional figures.

Hypothesize, based on prior observation and diagramming, what the unseen sides of the sculpture look like. Create a diagram showing hypothesis.

Share diagrams. Defend reasoning behind hypothesis in journal entry or class discussion.

Reflect on transparent geometric form:

- *Were the shapes that you diagrammed faces of the cube and pyramidal or triangular shapes?*
- *Did the shapes and relationships you represented include optical effects: refraction, reflections, shadows?*
- *What created the shapes seen on the surface of the 3-dimensional glass forms?*
- *What unique properties does glass have which changes our perception of forms in space?*
- *How do the properties of light and reflection relate to principles of geometry?*

Outcome

- Diagram illustrating observed and estimated geometric shapes and relationships.
- Diagram showing visual hypothesis for unseen point of view of sculpture.
- Participation in inquiry with focus on attributes of 3-dimensional glass forms.



Stanislav Libenský and Jaroslava Brychtová
Sphere in Cube, 1970-99
Mold-formed glass
19 ³/₄ x 19 ³/₄ in.
Photo: Gabriel Urbanek
Photo Courtesy of Porcela Plus



Stanislav Libenský and Jaroslava Brychtová
Cube in Sphere, 1980-99
Mold-formed glass
D. 19 ³/₄ in.
Photo: Gabriel Urbanek
Photo Courtesy of Porcela Plus

Dynamic Collaboration Form and Message

Teaching Process: School Educator

- Introduces Libensky´ and Brychtová Glass as artists and collaborators
- Facilitates discussion on thematic ideas and abstraction
- Presents strategies for linking shape and theme in design
- Groups students and presents problem to solve and parameters for collaborative process
- Guides student presentations
- *Materials: colored pencils, paper, rulers, round objects for templates*

Learning Process: Students

View art of Stanislav Libensky´ and Jaroslava Brychtová Collaboration.

Czechoslovakian artists Libensky´ and Brychtová collaborated to create glass sculpture for over 40 years. In a dynamic process of sharing and refining ideas, the artists worked together to create artwork the sum of their brilliance. The artists feel that the interchange of ideas in collaboration brings creativity to a level that a singular “line of thought” would not. Libensky´ would make drawings which were translated into clay sculpture, which would then be cast in glass. The region in Czechoslovakia which Libensky´ and Brychtová lived in has sustained a tradition of glassmaking for over 600 years. Communism before World War II drove many abstract artists (those favoring non-representational subject matter) out of the country. Since the government did not recognize glass as “Art” the abstract work of Libensky´ and Brychtová endured in the context of public art as a complement to new architecture.

Stanislav Libensky´ once said that “Glass has the ability to express all human feelings” 1981

- **Name and list words for possible themes relating to human feelings, human issues:**
- **Catalyst words:** joy, loss, fear, slavery
- **Discuss possible definitions of “Abstract Art:”** simplified or exaggerated form, a visual response to an object or idea that is not a realistic or representational image.
- **Brainstorm ways that simple combinations of shapes can have symbolic meaning:**
equality = symmetry
loss = missing shapes
belonging = a circle
alienation = a small fragmented shape separate from a larger cohesive form

Assume responsibilities within a group to:

- contribute to group with suggestions and effort

- demonstrate respect for other's opinions by using listening skills
- define challenges and encourage others
- build consensus through constructive behaviors
- document exchange of and synthesis of ideas

Collaboratively solve problem:

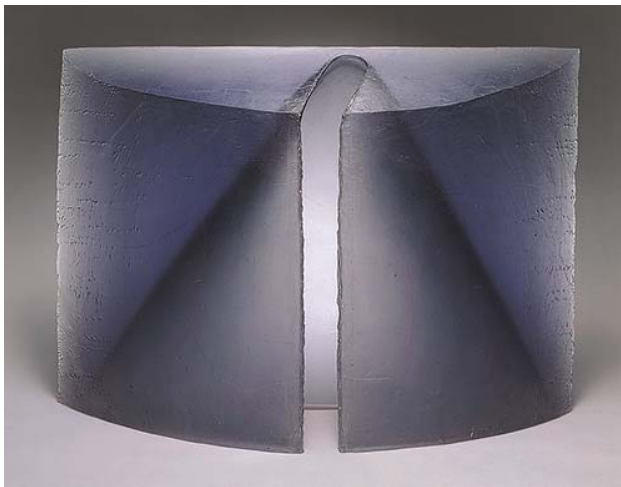
- Create a design/drawing for a 3-dimensional sculpture (glass or other material) which is abstract in form
- Express a human theme
- Shows more than one point of view of sculpture (top, sides...)

Reflect

- Present designs and discuss links between abstract shapes and thematic content.
- Students self-assess collaboration skills with focus on individual responsibilities and dynamics of groups process.

Outcome

- Students build understanding of experience potential of abstract form, develop dynamic collaboration skills in program solving within new context.



Stanislav Libenský and Jaroslava Brychtová
Vestment III, 1997-1999
Mold-formed Glass
The Gerard L. Cafesjian Collection

Casting Light Making Optic Sculpture

Teaching Process: School Educator

- Introduces glass sculpture of Libensky´ and Brychtová
- Presents technical challenges of art-making, with focus on physical properties of material
- Guides ice sculpture casting process
- Directs students documentation of effects of light in journal and photographs
- Facilitates student presentation
- *Materials: Rinsed flexible containers from soft drinks, cosmetics, foods: small and large in a variety of shapes for molds. Water, freezer space at school, food coloring, digital or video camera. This lesson works well with small numbers of students rotating through each step in the process since freezer, sink space and camera access is often limited.*

Learning Process: Students

- **View art of Stanislav Libensky´ and Jaroslava Brychtová Collaboration.**
Libensky´ and Brychtová collaborated for over 40 years to create glass sculpture. Their artistic vision of larger and larger forms expanded the limits of studio glass technology. The heating and cooling of large volumes of solid glass pose major technical challenges. The sculptures begin as drawings which are transformed, through collaborative process, into a clay sculpture with a plaster/silica mold is made form. The molten glass is then poured into the plaster mold and cooled (annealed) over an extended period of time to prevent cracking. Many sculptures have internal open spaces, or shapes inside of shapes creating light/space effects. Most colored pieces have light coloration in order to retain a high level of transparency. The sculptures are techniques as well as the fusing of lenses in sculpture further enhance optical effects in the art.

Create ice sculptures with interior space

Technical Problem Solving and Artistic Decision Making

- Choose a small container for mold: consider form technically (for ease of release of intact frozen form) and artistically: this will become the inner shapes cast in the sculpture.
- Add water, and small amount of food coloring, fully mixed in, for light transparent color.
- Freeze.
- Fill large container chosen exterior mold for sculpture.
- Using food coloring in the same range of color (keeping sculpture monochromatic) mix a different ratio of food coloring to water in the larger mod. (Differences in color create contrast)

- Release small frozen form from mold using warm water – place in water in larger mold.
- Arrange and freeze sculpture
- Wait for sunny weather conditions to release, carefully, sculptures from molds.

Choose orientation for sculpture.

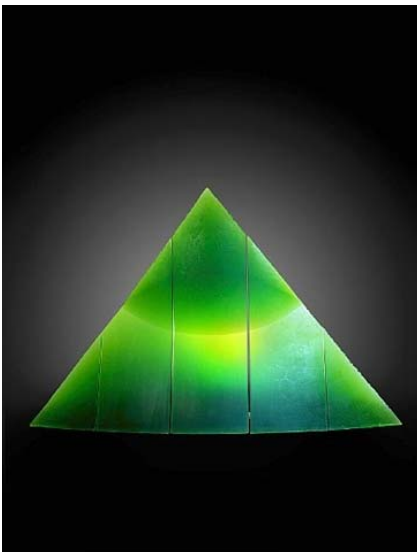
- **Document through written description and photography, 2-3 points of view of sculptures and observed light optical effects:**
 - Reflection on curved and/or flat surfaces
 - Refraction as light passes through different point of sculpture (bending of light)
 - Shadow
- **Place sculpture in “sculpture garden” outdoors after documentation is complete**

Reflect

- Students review and discuss artistic process and decision making in casting process.
- Students self-assess through presenting descriptive journal entries, and photo documentation of sculpture with internal and external space.

Outcome

- Students problem solve to cast sculpture ice form. Students analyze effects of light in interaction with form and color and isolate points of view that offer distinct optical effects.
- Students document findings through descriptive journal writing and photo documentation.



Stanislav Libensky´ and Jaroslava Brychtová
Green Eye of the Pyramid, 1993-94
 Mold-formed glass
 33 x 40 ¼ in.
 Photo Courtesy of the artists
 Photo: Gabriel Urbanek