

Passport: Day in the Life of a Glass Blower
Grade: K-4

Description:

Feel the heat – 2,100 Degrees Farenheit! A day in the life of Geoff Lee, a glass blower in Honolulu, Hawaii, reveals the skill, creativity, teamwork, and sweat involved in creating glass works of art.

Preparation for the Excursion

To ensure the most meaningful learning experience for your students, it is recommended that students engage in activities prior to the excursion. The excursion is intended to complement a comprehensive unit. The video resources provide students with a context for the virtual excursion. The additional resources and activities offer opportunities for curricular connections and integration within your larger unit of study. During the excursion, classes will be asked to share their response to the challenge question and the expert will provide feedback. Select a class response for the challenge question.

Video Link: Use the following link to introduce students to the artist Geoff Lee while he creates glass pumpkins – http://www.21-learn.com/artists/geoff_lee/index.htm

Challenge Questions:

As an investigative challenge for students, use the questions to prepare for the introduction of the Passport excursion. Present the questions to the students in advance of the excursion to ensure they have enough time to research the answers to the questions. The presenter will activate students' prior knowledge by eliciting responses from the participants.

1. What is so special about glass?
Answers will vary. Encourage students to think about glass' different surfaces, textures, and shapes.
2. How is glass used?
Answers will vary. Encourage students to think about the glass objects they use. Ask students to look around the classroom in search of glass.
3. What temperature does the glass need to be heated to blow glass?
2100°F and 2300°F
4. What do you think will happen to an object that cools too quickly?
If a hot glass object is cooled "too quickly," it may be strained at room temperature, and therefore may break easily.

Lesson at a glance:

Glassblowing began as a utilitarian method to produce glass 40 centuries ago in Mesopotamia (modern day Iraq and Syria). Today, glass blowing is not only a process to build products but also a magical art form and craft.

Glass is a state of matter meaning it is produced from chemical process of melting crystalline materials at high temperatures. Natural glass is formed by volcanic action and it is called *obsidian*. *Obsidian* is formed when the intense heat of a volcano forms with silica, forming the hard glass. Because of natural impurities, it is usually shiny, black, and opaque, but it can also be very dark red or green; its splinters are often transparent or translucent.

The discovering of glass making is attributed to the Phoenician sailors who made the discovery while cooking on the beach. They noticed the sand beneath the fire melted to form a liquid and later cooled and hardened. However, the true development of glass is hypothesized to have started in western Asia, perhaps *Mesopotamia*, at least 40 centuries ago. It was later discovered that if the material were thick enough, it would stand by itself. Pieces of solid glass could then be ground to shape by grinding it with stones, or sand and water, to produce vessels.

The tools used 40 centuries ago are still used in glassblowing in modern times. Students will be exposed to the tools used for glassblowing using the *Activity 1*. This activity is designed to introduce students to the tools and how they are used to blow glass. Discuss how these tools were used in ancient times to blow glass. Present the images in *Activity 1* and question—*What do you think these tools are used for?* Elicit responses from the students. After students have given their responses, introduce the tools and their function in glassblowing.

Activity 2 is designed to build prior knowledge of the students to prepare for the excursion. Using a KWL chart, discuss what the students know about glass and what they would like to learn about glass. This will draw potential questions for the presenter during the excursion. After the excursion, complete the KWL chart with new ideas and concepts learned by the students.

Vocabulary:

- blow pipe – a hollow tube used to blow glass. A gather of molten glass is attached to one end of the blow pipe and the artist blows through the other end to inflate the glass like a bubble.
- glory oven/glory hole – the oven that heats glass. Glory holes reach temperatures of 2,100 degree Fahrenheit.
- temperature – the degree of hotness or coldness of a body or environment
- work bench -- a glassmaker sits at the bench and must keep rolling the blowpipe back and forth along the two extended arms of the bench
- glass – state of matter, with properties of crystals but also liquid. Glass is made of silica or sand, an alkali such as soda, lime, and other compounds

Lesson Outcomes:

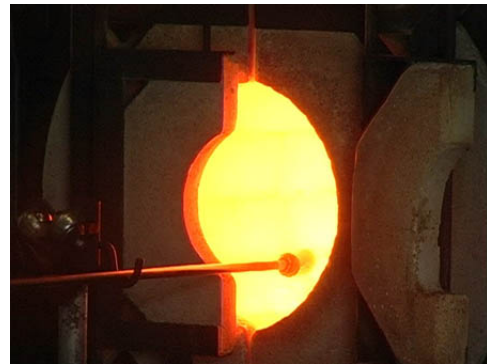
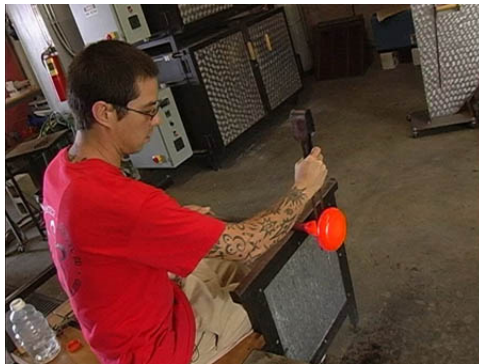
The students will:

- investigate the origins of glassblowing
- understand the tools used for glassblowing
- define the elements used in glassblowing

Activity 1 – Tools of the Glassblowing Trade

Directions: Below are the images used to create blown glass. Describe the different images with the students and have them try to determine what each tool is and how it might be used.

- Blowpipe**—a hollow metal tube of iron or steel
- The Bench**—a glassmaker sits at the bench and must keep rolling the blowpipe back and forth along the two extended arms of the bench to keep the glass from cooling
- Glory oven**—Oven that is used to reheat glass as it is being worked. Usually the front is open for easy access during the working of a piece. The glory oven temperature is 2200 degrees Fahrenheit.
- Pair of Jacks** – a tool that a glass blower uses to shape the glass, using the jacks to flatten the bottom of the glass pumpkin or create a weak spot to allow for easy removal from the blowpipe
- Kiln** – an oven that allows glass products to cool or anneal slowly to make sure the glass product does not break (Include a picture)



Activity 2 – Glassblowing KWL chart

K – I know	W – I want to know ...	L – I learned ...

Glassblowing – A Bibliography

Websites

- *Metropolitan Museum of Art—Blown Glass from Islamic Lands*
http://www.metmuseum.org/toah/hd/blow/hd_blow.htm
- *Metropolitan Museum of Art—Glass with Mold-Blown Decorations from Islamic Lands*
http://www.metmuseum.org/toah/hd/mold/hd_mold.htm
- *Corning Museum of Glass* <http://www.cmog.org/index.asp?pageId=426>
This website offers the ancient history of glassblowing.
- *Glassblowing.com* <http://www.glassblowing.com/hotglass/process.php>
A more advanced interpretation of the history of glassblowing.
- *Museum of Glass* http://www.museumofglass.org/s02_virtual_hotshop.jsp
This interactive website allows students to use the tools to design blown glass.

Books

- Campbell Geeslin, Ana Juan (Illustrator). *Elena's Serenade* (*Americas Award for Children's and Young Adult Literature*). Atheneum/Anne Schwartz Books: 2004. ISBN: 0689849087
This book is about a Mexican girl who is ready to prove why she can be a glassblower, even if she is a girl. A winner of *Americas Award for Children's and Young Adult Literature*.
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