

The Bruce Museum of Arts and Science Education Department Presents: Educator Guide

Shapes and Patterns



The Bruce Museum of Arts and Science Education Department develops Educator Guides to provide detailed information on field trip planning, alignment with Connecticut State Goals and Learning Standards and New York Education Standards, as well as suggested hands-on classroom activities to do before, during, and after your visit to the Museum.



Teacher Notes:

This educator's guide is separated into seven parts:

- Exhibition guide
- Curriculum Connections
- Teacher and Student Resources
- Games and Puzzles
- Activities
- How to schedule your Museum visits
- Education Staff List

Children will define 5 basic shapes, find shapes in natural objects from museum collections, and create patterns and symmetry. Pattern activity included.

School programs are inquiry based and promote critical thinking, written, and oral expression. They feature hands-on-learning activities using objects from Museum collections and exhibitions. Many are interdisciplinary and address various learning styles.

For BruceMobile program information contact Sheean Haley, Manager of Outreach Education at 203-869-6786 Ext. 323 or by email shaley@brucemuseum.org.

For reservations contact Anne Burns at 203-869-6786 Ext. 338 or by email anneburns@brucemuseum.org



Exhibition Guide:

Patterns:

The natural world contains an infinite variety of patterns. Patterns are found in plants and foliage and in animals. All living things create patterns. Patterns are also constantly being created by simple physical laws. There are patterns in the sand dunes created by blowing winds. There is a pattern in the vortex of a whirlpool and in the formation of an ice crystal. Other examples of things in nature that have patterns are:

- Spider webs
- Zebras
- Honeycomb
- Sea shells



Honeycomb, and the bees that produce it have a distinct pattern.

Symmetry:

Symmetry is a way that units of pattern are organized. A figure is symmetric if you can pick up a copy of it, move it to a new location or orientation, and set it down so that it exactly matches. Mirror or reflection symmetry divides a figure or design into halves that are mirror images. The axis can be located either vertically or horizontally. Mirror symmetry is found in both natural and man-made objects. Butterflies are good examples of mirror symmetry. Human faces have symmetry! In fact, most animals and plants exhibit some form of symmetry in their body shape and their markings. Other examples of things in nature that have symmetry are:

- Snowflakes
- Butterflies
- Leaves
- Diatoms (type of phytoplankton, tiny marine plants)
- Flowers



A sea star has mirror symmetry (above).and an apple, cut crosswise, also has symmetry with its star-shaped core (below).



Curriculum Connections:

Connecticut

Pre-K/ Kindergarten

Elements and Principles

- Recognizes and describes the basic concepts of the elements of art.
- Recognizes specific examples/elements of art found in the environment.
- Identifies and uses primary colors.
- Uses shapes and lines to create patterns.

Content

- Recognizes works of art inspired by nature and the environment

Connections

- Identifies basic geometric shapes in art compositions and the environment.

Grade 1

Elements and Principles

- Recognizes and creates a variety of patterns with lines and shapes.

Connections

- Recognizes and creates a variety of patterns with lines and shapes in a natural environment.
- Identifies a variety of geometric shapes.

New York

PreK

Elements

- Shape – Explore and investigate shape in artwork (PI 2,8,11,15)

Principles

- Pattern – Explore and investigate pattern in artwork.

Kindergarten

Elements

- Shape – Initiate discussions on shape in artwork.

Principles

- Pattern – Initiate discussions on pattern in artwork.

Grade 1

Elements

- Shape – Recognize and identify basic shapes in art (NYSS # 1 & 3/PI 3,11)

Principles

- Balance – Identify symmetry (NYSS #1 & 3/PI 1 & 11)
- Pattern – Explore and create patterns using shapes (NYSS #1,3,4/PI 1,10,11,14)



Student and Teacher Internet Resources:

http://jwilson.coe.uga.edu/EMT668/EMAT6680.2002.Fall/Nazarewicz/7210_final_2/7210_Project/index.html

http://atschool.eduweb.co.uk/sirrobbitch.suffolk/patterns_nature/

<http://www.alozkidsstuff.com/shapes.html>

<http://www.first-school.ws/theme/shapes.htm>

<http://www.tlsbooks.com/preschoolworksheets.htm>

http://www.dickblick.com/lessonplans/archive/repeat_pattern.pdf

<http://www.kidsolr.com/earlychildhood/basicsskillsa.html>

Games and Puzzles:

- Sammy's Shapes
<http://www.primarygames.com/storybooks/sammy/start.htm>
- Shape Inlay
<http://www.primarygames.com/storybooks/sammy/start.htm>



Activities:

Bugs take Shape

(from www.crayola.com for Pre-K-3rd grade)

Materials:

Pictures of bugs

Modeling clay

Modeling tools (e.g., plastic knives, craft sticks, straws)

What to do:

- 1) Look at butterflies and moths, ladybugs, spiders, worms, and a variety of other insects. Talk about what you see in terms of shapes, colors, patterns, and body parts.
- 2) With modeling clay, form a 3-dimensional bug. Repeat the shapes, colors, and patterns found in nature or be imaginative and design a fantasy bug.
- 3) Use modeling tools such as plastic knives, craft sticks, or drinking straws to cut and shape the dough.

Patterns in Nature Booklets

(from <http://www.canteach.ca/elementary/pattern4.html> for grades K-3)

Students will examine patterns on objects in nature, then use rubbings of these patterns to create pattern booklets.

Materials:

natural objects that have texture

walnuts, leaves, gourds, rocks, shells, corn, pine cones, etc.

paper for booklet pages

pencils, crayons, chalk (for rubbing)

What to do:

- 1) Explain how rubbings can be a way to record textures.
- 2) Demonstrate how to do a rubbing (place paper on item, use pencil, crayon, or chalk to color the area that the item is under).
- 3) Show all the items that you came up with that have textures.
- 4) Have children do rubbings of items provided, or of items found on their own.
- 5) Ask children to make a title page for booklet.
- 6) Staple all the rubbings as well as the title page together to form a booklet.



Shape Walk

(from <http://www.thinkingfountain.org/s/shapewalk/shapewalk.html>)

What to do:

- 1) Go for a walk in search of a shape. Look closely at things around you and bring a camera along to capture the shapes you see.
- 2) What shapes are most common? Where are squares found in nature? Which is easier, finding shapes in natural or human-made structures? Imagine a place that is made out of only one shape, draw a picture and write about this place.

Suggested Reading:

Burns, Marilyn. Greedy Triangle: Scholastic Paperbacks, 2008.

Harris, Trudy. Pattern Bugs: Millbrook Press, 2001.

Harris, Trudy. Pattern Fish: Millbrook Press, 1998.

Hoban, Tana. Cubes, Cones, Cylinders, & Spheres: Greenwillow, 2000.

Hoban, Tana. So Many Circles, So Many Squares: Greenwillow, 1998.

Meachen Rau, Dana. Star in My Orange: Looking for Nature's Shapes: Lerner Publishing Group, 2006.

Rogers, Paul. The Shapes Game : Henry Holt & Co., NY, 1990.

Stockdale, Susan. Nature's Paintbrush: The Patterns and Colors around You : Simon & Schuster, NY, 1999.

Swinburne, Stephen. Lots and Lots of Zebra Stripes: Patterns in Nature: Boyds Mills Press, 2002.

Voss, Gisela. Museum Shapes : Museum of Fine Arts, Boston, 1993.



How to schedule your museum visits

- Adult and school groups of 8 or more require advance reservations and are subject to a special group fee.
- Museum-Based School programs are available Tuesday through Friday at 10:00 am, 11:15 am, and 1:00 pm
- After-School Museum-Based programs are available Tuesday through Friday, last one hour, and start no later than 4:00 pm.
- The Bruce Museum is accessible to individuals with disabilities.
- Call Bruce Museum Reservations Manager, Anne Burns, at 203-869-6786 ext.338. You may leave a voicemail message at this number at any time. Please leave a choice of times to return your call.
- **Fees**
A confirmation/invoice will be mailed four weeks prior to the program. Pre-payment is preferred, however, Museum programs may be paid on day of visit. Payment is by check only, payable to Bruce Museum, Inc.
Museum-Based Programs: \$45 per program.
- **Scholarships**
Thanks to the generosity of our corporate members and sponsors, scholarships are available under special circumstances. Please contact the Museum for more information.
- **Cancellations**
There is a \$15 charge if cancellation is less than two weeks in advance of the scheduled program.
- **No Eating Facilities are available at the Museum**
In case of bad weather, classes will be permitted to eat in the Education Workshop if they reserve the room in advance.
- **Class Size**
In order to maintain quality education, classes are limited to 25 students. Pre-school class size is limited to 20 students.
- **Supervision: REQUIRED for all programs**
Museum visit: 1 adult for every 5 children, to accompany the children at all times.
Self-guided tours: If you would like your class to tour the rest of the Museum before or after the scheduled program, you must tell us when you make your reservation to avoid conflict with other groups.
Nametags: Help to personalize program and enhance student behavior.
- **Conduct**
In order to enhance everyone's enjoyment of the Museum, please go over these rules with your students in advance:
 - Please do not run in the Museum.
 - Please talk in quiet voices.
 - Please do not touch paintings or objects

Special requests or curriculum needs

All of the programs are flexible and can be adapted to audiences with special needs or to your curriculum objectives. Please discuss with the Museum Education staff in advance.



Education Department Staff List

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