TEACHER RESOURCE PACKET

Grade Level: 4th Grade

Making connections between geometry and the creative process

The Museum To Go program and these educational materials are made possible by the generous funding of the Ohio Arts Council and Arts in Stark.

This document, companion artwork images, virtual tour of the exhibit: *Tangled Up in Blues*, and many other resources are available through the Canton Museum of Art website at:
www.cantonart.org/learn/museum-to-go.

What's Your Angle?

Making connections between geometry and the creative process

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Jimmy Ernst, *Untitled Silkscreen*, 1970

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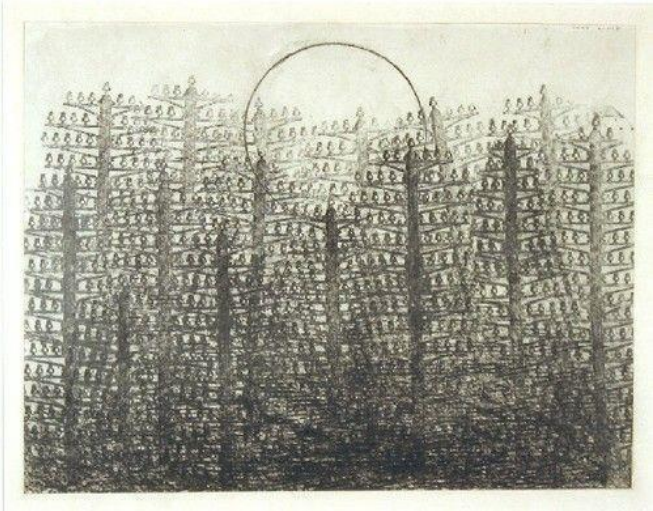
These two silkscreens are part of a set of four that were created sometime around 1970 by Jimmy Ernst. Jimmy Ernst is the son of Max Ernst a well-known surrealist painter and the founder of the Dada movement. Max Ernst is known for inventing the concept of frottage: **:** A technique in the visual arts of obtaining textural effects or images by rubbing lead, chalk, charcoal, etc., over paper laid on a granular or relief like surface.



Max Ernst, *Forest and Sun*, 1931
Graphic frottage on paper

Max Ernst, *The Entire City,* 1934

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Jimmy's childhood was spent in Germany when Hitler's Nazi party rose to power. He escaped Germany and fled to the United States when he was only eighteen years old. He was taken under the wing of Peggy Guggenheim and given a job as an office boy in the mail room of the Museum of Modern Art. Jimmy worked in both surrealist and abstract expressionist styles. The idea of silence is a major theme in much of Jimmy's work. He was influenced by the rituals of the Southwest American Indians and collected the Kachina dolls of the Hopi Tribe.

Kachina Doll (Kokopol),
late 19th century, Brooklyn Museum

Two Hopi Indian kachina dolls
(male and female), ca.1900

Common kachina figures in regalia

Later in his career, he was inspired by American Jazz. He wrote: "There was the fleeting thought at some point in the night, that, hidden in the intricate structures of boogie-woogie, Kansa City, New Orleans and yes, the blues was the image of architecture." These architectural images are found in the geometric shapes, arcs, and angles of his paintings

"The Kansas City Boogie Woogie" - Deryck Sampson (1943 Beacon)
Audio Clip: https://www.youtube.com/watch?v=DpMAeEeNLw8

Various Artists, Kansas City Swing,
Blues, Jive & Boogie

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Overview: Students will observe pieces of art from the CMA's Permanent Collection and recognize the role that geometry plays in the creation of their compositions.

Materials: art reproductions, magnetic boards and magnetic textured shapes, 24"x 36" sheets paper, charcoal, black crayons, protractors

Content Standards:

Math:

Geometry: Draw and identify lines and angles, and classify shapes by properties of their lines and angles.

- 4G.A.1 Draw points, lines, line segments, rays, angles (right, acute, obtuse), and perpendicular and parallel lines. Identify these in two-dimensional figures.
- 4G.A.2 Classify two-dimensional figures based on the presence or absence of parallel or perpendicular lines, or the presence or absence of angles of a specified size. Recognize right triangles as a category, and identify right triangles.
- 4G.A.3 Recognize a line of symmetry for a two dimensional figure as a line across the figure such that the figure can be folded along the line into matching parts. Identify line-symmetric figures and draw lines of symmetry.

Language Arts:

Reading: Integration of Knowledge and Ideas

- RI.4.7 Interpret information presented visually, orally, or quantitatively (e.g., in charts, graphs, diagrams, timelines, animations, or interactive elements on Web pages) and explain how the information contributes to an understanding of the text in which it appears.

Speaking and Listening: Comprehension and Collaboration

- SL.4.1 Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on *grade 4 topics and texts*, building on others ideas and expressing their own clearly.
- SL.4.1b Follow agreed-upon rules for discussions and carry out assigned roles.
- SL.4.1c Pose and respond to specific questions to clarify or follow up on information, and make comments that contribute to the discussion and link to the remarks of others.

Visual Art:

- 4RE Generate criteria for discussing and assessing works of art.
- 5RE Refer to criteria and use art vocabulary when discussing and judging the quality of artworks.
- 6RE Give and use constructive feedback to produce artworks that achieve learning goals.

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Background/Key Ideas: Students will use their powers of observation to identify the various angles, parallel and perpendicular lines, and geometric shapes that can be found in both the positive and negative areas of two silkscreens by Jimmy Ernst. Students will then create artwork of their own, working with a variety of angles, shapes, textures and lines to create a symmetrical composition.

Procedures:

Introduction: Students will take a virtual tour of the Canton Museum of Art's Permanent Collection Exhibit *Tangled Up in Blues.* Several pieces will be identified as works of art that use geometry in the creation of their compositions.

Discussion: Students will be presented with reproductions of two silkscreens by Jimmy Ernst from the CMA's Permanent Collection. After they learn about the artist and the background of the pieces of art, students will be asked to point out acute, right, and obtuse angles, perpendicular and parallel lines, and to explain how the composition shows symmetry.

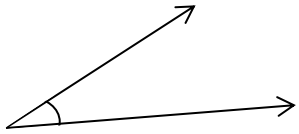
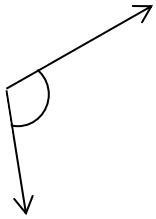
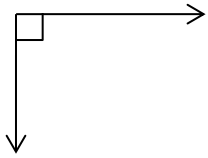
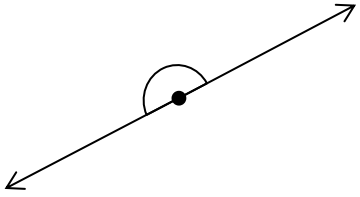
Activity: The term frottage (which was coined by Jimmy Ernst's father, Max Ernst) will be explained. Students will be given magnetic boards and a variety of magnetic geometric shapes with various textures. Working in teams of four to six students they will create a symmetrical composition that explores a variety of angles and lines. Working together the team will create a rubbing of this composition using charcoal and black crayon.

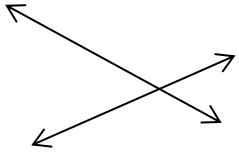
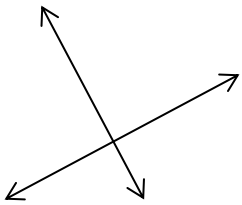
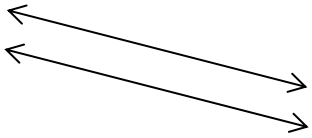
Closure and Assessment: Students will use protractors to identify various angles and lines in their art work.
Enrichment Activity: Students could further their knowledge by using protractors to measure these angles and incorporate the measurements in the artwork.

Vocabulary:

Abstract Expressionism: A school of art that flourished primarily from the 1940s to the 1960s, noted for its large-scale, nonrepresentational works
Acute Angle: An angle with a measure less than 90 degrees.
Composition: The placement or arrangement of visual elements or ingredients in a work of art.
Frottage: A technique in the visual arts of obtaining textural effects or images by rubbing lead, chalk, charcoal, etc., over paper laid on a granular or relief like surface.
Obtuse Angle: An angle with a measure greater than 90 degrees and less than 180 degrees.
Parallel Lines: Lines in a plane that never intersect.
Perpendicular Lines: Two lines that intersect at right angles.
Right Angle: An angle that is 90 degrees.
Silkscreen: A printmaking technique in which a mesh cloth is stretched over a wooden frame and the design is printed by having a squeegee force color through the pores of the material in areas not blocked out.
Straight Angle: An angle that is 180 degrees.
Surrealism: A movement in **art** and literature that flourished in the early twentieth century. **Surrealism** aimed at expressing imaginative dreams and visions free from conscious rational control.
Symmetry: A balance achieved when one half is a mirror image of the other half.

What's Your Angle?
Pre-Assessment

1) ☐ Acute ☐ Obtuse ☐ Right ☐ Straight	
2) ☐ Acute ☐ Obtuse ☐ Right ☐ Straight	
3) ☐ Acute ☐ Obtuse ☐ Right ☐ Straight	
4) ☐ Acute ☐ Obtuse ☐ Right ☐ Straight	

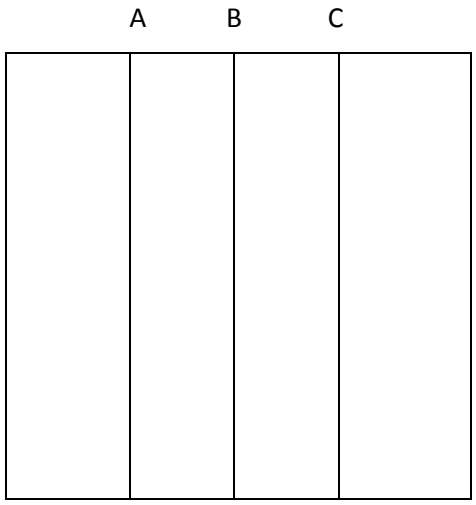
5) ☐ Parallel ☐ Perpendicular ☐ Intersecting	
6) ☐ Parallel ☐ Perpendicular ☐ Intersecting	
7) ☐ Parallel ☐ Perpendicular ☐ Intersecting	

Math is used in which types of art?

- ☐ Architecture
- ☐ Sculpture
- ☐ Painting
- ☐ Drawing
- ☐ Printmaking
- ☐ Ceramics

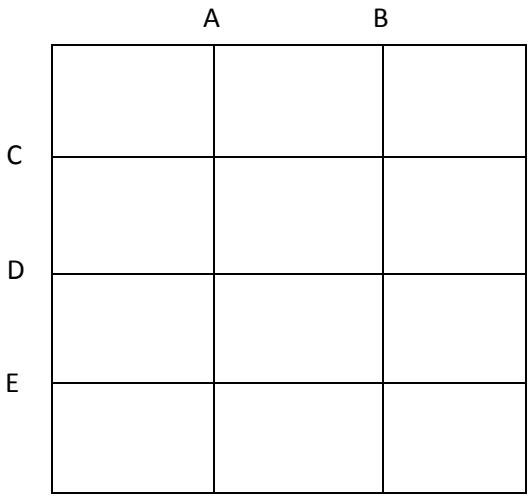
Math is most related to which two elements of design?

- ☐ Color
- ☐ Shape
- ☐ Texture
- ☐ Line
- ☐ Value



Which line is the line of symmetry?

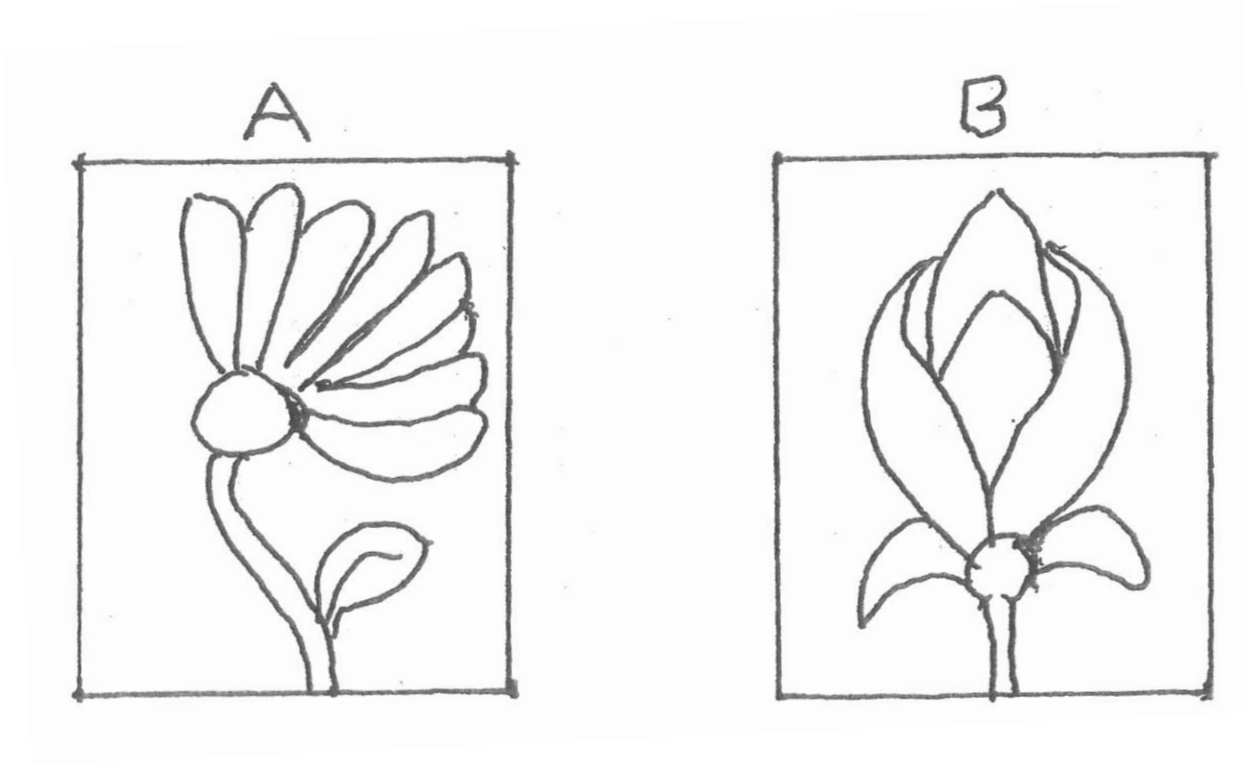
_____



Which line is the line of symmetry?

_____

Which image is symmetrical? _____



What's Your Angle?
Post Assessment

Place an X on one acute angle.

Place a heart on a straight angle.

Place a star on one obtuse angle.

Place a circle on the perpendicular lines.

Place a crescent moon on a right angle.

Place a triangle on the intersecting lines.

Draw a line on the line of symmetry.

Resources:

Wilkinson, M. (2012). Lesson Plan: Geometric Design in Islamic Art. Retrieved November 10, 2016, from http://www.metmuseum.org/learn/educators/lesson-plans/geometric-design-in-islamic-art

Heskett, Elizabeth, "Thinking Outside the Box: An Introspective Look at the Use of Art in Teaching Geometry" (2007). Senior Honors Theses. Paper 155. Retrieved November 10, 2016, from http://commons.emich.edu/cgi/viewcontent.cgi?article=1154&context=honors

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Maine, S. (2016, March 7). 27 glorious geometric patterns in design. Retrieved November 10, 2016, from http://www.creativebloq.com/graphic-design/geometric-patterns-11135236

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