

STEAM

How is being an artist like being a scientist or a mathematician? In this lesson, students practice core STEAM skills, learning directly from the objects about how artists create innovative solutions to complex problems.

Grade Level

Grades 4–12

Common Core Academic State Standards

- [CCSS.ELA-LITERACY.CCRA.R.1](#)
- [CCSS.ELA-LITERACY.CCRA.SL.1](#)
- [CCSS.MATH.PRACTICE.MP4](#)

National Visual Arts Standards

- Responding: understanding and evaluating how the arts convey meaning

Next Generation Science Standards

- Scientific Practices: Asking questions and defining problems
- Scientific Practices: Developing and using models

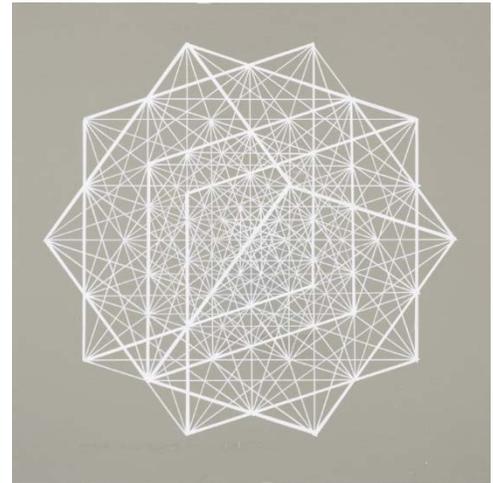
Suggested Learning Goals

Students will be better able to:

- Apply their understanding of STEM skills and concepts to the exploration of artwork
- Understand ways in which the work of artists and craftspeople is similar to the work of scientists, mathematicians, and engineers
- Recognize examples of creative problem-solving in the context of art and material culture

Essential Questions

- How is being an artist like being a scientist or a mathematician?
- How have innovations in the arts intersected with the fields of science, technology, engineering, and math?



Decagon, 1970

Edna Andrade (American)

White opaque watercolor or ink on tan card with silver foil facing paper

Sheet: 9 x 9 inches (22.9 x 22.9 cm)

Purchased with the Marion Stroud Fund for Contemporary Art on Paper, the Margareta S. Hinchman Fund, and the Joseph E. Temple Fund, 2008

2008-100-13

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Suggested Vocabulary

The following terms represent topics and concepts that are commonly included in a STEAM gallery lesson. Not every term will be used in every lesson.

Anatomy	Balance	Focal point	Pattern	Proportion	Rotation
Angle	Congruence	Kinetic energy	Perspective	Ratio	Symmetry
Architecture	Dimension (2D, 3D)	Grid	Potential energy	Reflection	Tessellation

Lesson-Specific Activity

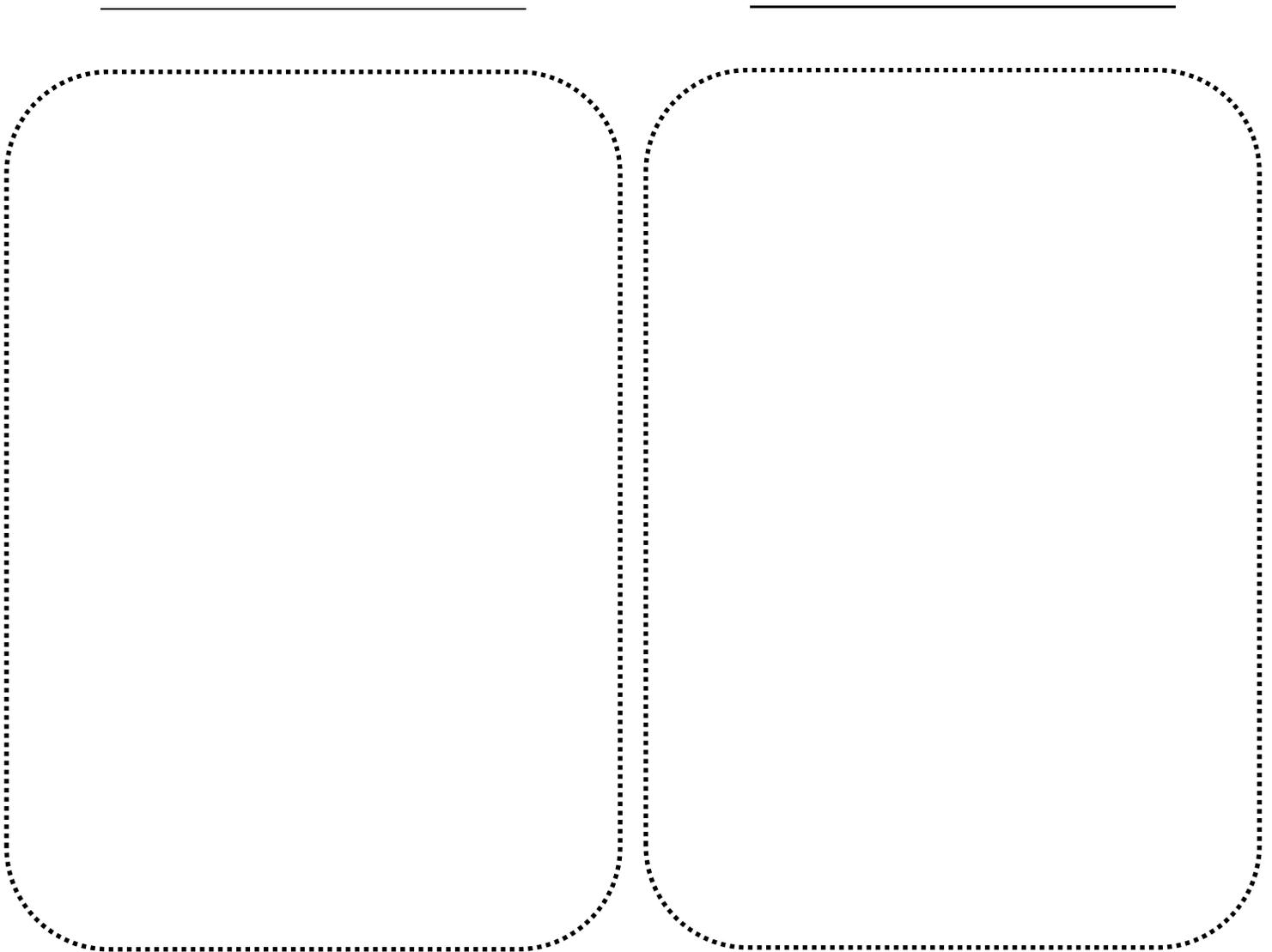
This activity is designed to prepare students for thinking and talking about artworks they may see during a “STEAM” lesson.

- Begin a class discussion about the STEM fields and art by asking students what science, technology, engineering, and math have in common. Why do students think these fields are grouped together?
- Ask students to make a mental picture of an artist and a scientist. Ask what comes into their minds when you say the word artist? How about scientist? Distribute the Picture Frames worksheet to students. Label one frame “Artist” and the other frame “Scientist.” Ask students to sketch their impressions of an artist or a scientist in each frame.
- Make a list of word or phrase associations on chart paper or a whiteboard for the word artist. Do the same for the word scientist. Guide students to name the types of activities that might be done by each person, the skills they need, and the tools that they might use. Encourage students to think beyond their first impressions. Are there some words or phrases that appear on both lists?
- On the board, draw two intersecting circles. Label one Art and the other STEM. As a group, add a few of the words from the lists in the appropriate circle. Ask students what words might belong in the center.
- Distribute the Venn diagram worksheet. Give students some time to work in pairs to add more words and phrases to the diagram.
- Engage students in a discussion of the acronym STEAM, using words in the center of their Venn diagrams as a point of reference. Why is art included as an area of study in STEAM? How does the study of science influence an artist? How does engaging in an artistic activity help a scientist? How does each profession use technology to help their work? How is mathematics important to each?
- Bring students’ completed Venn diagrams to the Museum when you come for your field trip.

Supplementary Material

- “[Investigation: Where Art Meets Science,](#)” by Tricia Fitzpatrick, *Art21 Magazine*; provides background information for the teacher about intersections between artistic and scientific pursuits

Picture Frames Worksheet



Venn Diagram Worksheet

