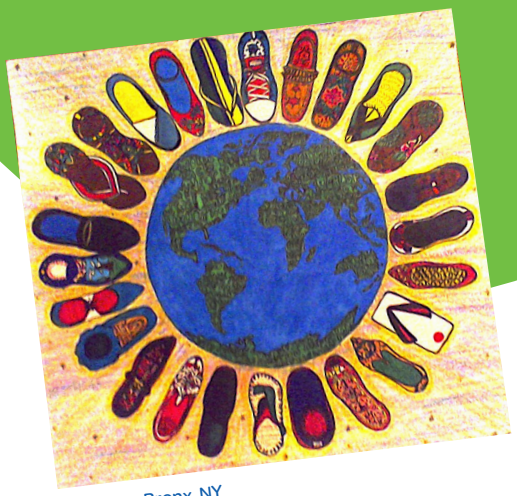
Math and Art Verbs in Action

Math As a Visible Language



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Introduction

One interesting surprise about math and art is that they share very similar vocabulary. Sometimes, one word used in math discussions means something different in art, but more often these two subjects share the same nouns and verbs. In this project children will explore how math and art verbs connect.

LEARNING OBJECTIVES

Children will:

- create two sketches, one that depicts a math concept and another that depicts an art concept. Discuss the concepts from each discipline's perspective;
- develop lists of math and art verbs; and
- compare and contrast the verbs to find connections between the two subjects.

Vocabulary

math	verb	parallels
art	noun	same
action	definition	different

Essential Questions

- What words describe actions? How are action words different from and similar to each other?
- Describe some action verbs that have more than one meaning, depending on the subject.

Guiding Questions

- What words describe the actions used when doing math work and creating art?
- How are some of the verbs' meanings different, similar, or the same when used to describe math work versus art work?
- How can parallel definitions be visually represented?

Supplies

- Crayola® Crayons, Colored Pencils, or Markers
- Paper (plain or colored)
- Crayola® Blunt Tip Scissors
- Crayola® Glue or Glue Stick

Prepare

This project involves creating math and art activities, then comparing the actions used in both. Children can help to plan and organize the space where the project will be done. You might want to post a sign that says: *"There could be more than one right answer."*

Applying Math Processes to this Project

PROBLEM SOLVING:
What does flexible thinking mean? Why is it important when looking for similarities between math and art vocabulary?

REPRESENTATION:
What tools help children visually represent math and art action words?

COMMUNICATION:
What questions will encourage children to explore more than one idea and realize there are multiple right answers?

REASONING & PROOF:
Will this project help build children's deeper understanding of the relationships between math and art? How? Why? What is the reasoning and evidence?

CONNECTIONS:
How do the connections between these two subjects help children learn overarching concepts? How might working in their more comfortable discipline help build understanding of concepts they struggled with in the other subject?

Math and Art Verbs in Action

CREATE

- Ask children to create two sketches: 1. Represent something they are studying in *math*. 2. Draw something that pertains to an *art* project. See what ideas they come up with on their own, and provide suggestions if necessary. For example:
  - A math sketch might show a repeated pattern such as sets of *five* or *ten*. A math sketch could represent an addition or multiplication problem with images of objects used in the math operations. Other math sketches could be a map or a measuring tool, a geometric shape, or an example of a whole divided into fractions.
  - What could they create pertaining to art? They can make a two-dimensional drawing on paper or an outdoor sketch using sidewalk chalk. It can be an imaginary painting on an air canvas with a hand or elbow dipped in invisible paint. Different learners use art media differently.
- As children create, talk about the action words and ask them to call out verbs that describe what they are doing. Make two different lists—one while they are doing their math sketches and another list when they are creating their art drawings.

PRESENT

- Have children present their two artifacts, describing how they made them and the ideas the visuals represent.
- Ask them to share lists of verbs used in both sets of created artifacts.
- Discuss the verbs having children describe when they were thinking, arranging, adding, subtracting, representing, calculating, measuring, drawing, revising, visualizing, arranging, displaying, and so on.

RESPOND

- Ask children to add additional math and art verbs by intentionally recalling the actions involved when they did *math* and *art*.
- Together, decide where to display the two lists of verbs, preferably in a place where they can continue to add more action words in the future.

CONNECT

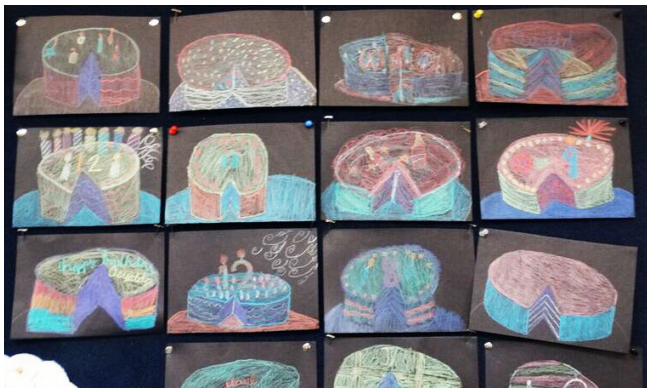
- How many of the verbs in each list can also be used when doing the other subject? For example, the word *adding* is often on children's *math* list. Through discussion children realize that *adding* also describes combining images or layering colors when creating *art*.
- Make the connection between math verbs and art verbs visible. Select one verb from the overlapping list. Write down the verb, then create two illustrations to show what its definition looks like in both math and art.

For Younger Children

- Describe verbs as action words that often end in *-ing*. Help them understand this part of speech and add to the list by focusing on verbs that can be observed and demonstrated.
- Younger children learn through physical actions. When math and art concepts and skills are physically represented, especially through creative movement, those concepts get embedded in long-term memory.

For Older Children

- Older children can explore verbs that describe thinking processes such as reflecting, comparing, deciding, exploring, representing, communicating, and so on. Urge them to dig deeper into vocabulary parallels. They can create noun lists in addition to verb lists.



Child Reflections

- What feelings did you experience when doing math and art projects? Were the feelings the same or different, and do you have a personal preference for working in one of these subject areas?
- Did creating art help you better understand math? Did working with math help you understand art?
- Was it a surprise that math and art use so many of the same words?
- What other similarities do you see between math and art? Consider how they both involve shapes, lines, and measurements.

Adult Reflections

- What did I learn by observing children as they worked?
- How did focusing on action words help identify what they know about verbs?
- How did sketching make their thinking visible?
- What other subjects share vocabulary parallels? Consider language arts, music, science, and so on. What if subjects were taught together to support different learning styles and subject preferences?

Standards and Skill Development

Standards provide a map of what students should know and be able to do. The lists help teachers and families plan in developmentally appropriate ways. This project addresses the following standards:

LANGUAGE ARTS

- Acquire and use accurately a range of general academic and domain-specific words and phrases.
- Demonstrate understanding of figurative language, word relationships, and nuances in word meanings.
- Demonstrate independence in gathering vocabulary knowledge when encountering an unknown term important to comprehension or expression.
- Integrate and evaluate content presented in diverse media and formats, including visually, quantitatively, and orally.
- Present information, findings, and supporting evidence such that listeners can follow the line of reasoning; and make sure that the organization, development, and style are appropriate to task, purpose, and audience.

MATHEMATICS

- Make sense of problems and persevere in solving them.
- Use and connect mathematical representations.
- Reason abstractly and quantitatively.
- Construct viable arguments and critique reasoning. Facilitate meaningful mathematical discourse.
- Look for and use structure. Look for regularity and patterns.

SCIENCE

- Ask questions about the features of the phenomena observed and conclusions drawn from models or investigations.
- Devise pictorial and simple graphical representations of findings to develop explanations.
- Obtain, evaluate, and communicate information. Present data in a form that can reveal any patterns and relationships that allow results to be communicated to others.
- Recognize patterns that suggest relationships worth investigating further.
- Convey designs through sketches, drawings, or physical models. These representations are useful in communicating ideas for a problem's solutions to other people.

VISUAL ARTS

- Explore uses of materials and tools to create works of art or design.
- Apply visual organizational strategies to the designs and produce a work of art, design, or media display that clearly communicates information or ideas.
- Use art vocabulary to describe choices while creating art.
- Explain the process of making art while creating.
- Analyze multiple ways that images influence specific audiences.
- Apply one set of criteria to evaluate more than one work of art.
- Identify how art is used to inform or change beliefs, values, or behaviors of an individual or society.

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