

ARTS IMPACT LESSON PLAN

Visual Arts and Math Infused Lesson

The Art of Numbers

Author: Natalie Ramsey Grade Level: Pre-Kindergarten



Enduring Understanding

Numbers can be expressed by written numerals or by visual representations of objects.

Lesson Description (Use for family communication and displaying student art)

In this visual arts and math lesson, students will use a printing process to create a work of art that represents numerical concepts. They create groups of shapes or objects that match numbers on a bingo card and fill the negative space around the objects with oil pastels. Finally, they go on a Number Quest to match the numbers on a card to the numbers of shapes in the art.

Learning Targets and Assessment Criteria

Target: Understands cardinality – that numbers represent specific quantities of things.

Criteria: Matches numbers with shapes in a group.

Target: Creates a print.

Criteria: Transfers ink with stamp/sponge to surface of paper.

Target: Identifies and uses negative space.

Criteria: Fills space between printed shapes with color.

Vocabulary	Materials	Learning Standards
<p><u>Arts Infused:</u> Symbol</p> <p><u>Math:</u> Numbers Numeral</p> <p><u>Arts:</u> Negative space Print</p>	<p>Museum Artworks or Performance</p> <p>Seattle, WA Seattle Art Museum</p> <p>Tacoma, WA Children’s Museum of Tacoma Tacoma Art Museum</p> <p>Materials Card stock, white, 8.5x11”: copy bingo cards from lesson; Card stock, white, 12x12”; Drawing paper: 4x4”, four per student; Stamps: rubber/foam; Ink pads, black; Oil pastels; Classroom Assessment Worksheet</p> <p align="center"><i>continued</i></p>	<p>WA State Arts Grade Level Expectations <i>For the full description of each WA State Arts Grade Level Expectation, see: http://www.k12.wa.us/Arts/Standards</i></p> <p>1.1.2 Elements: Shape and Form 1.3.1 Styles of Cultures and Times 2.1.1 Creative Process 4.2.1 Connection between Visual Arts and Math</p> <p>Early Learning Guidelines (Pre-K – Grade 3) <i>For a full description of Washington State Early Learning and Child Development Guidelines see: http://www.del.wa.gov/development/guidelines/ (Age 4-5) 6. Learning about my world: Math: Count and group things by number; Identify by sight how many are in a small group of objects. Arts: Use a variety of materials to create representations of people and things.</i></p> <p>Common Core State Standards (CCSS) in Math <i>For a full description of CCSS Standards by grade level see: http://www.k12.wa.us/CoreStandards/Mathematics/default.aspx</i></p> <p><u>Counting and Cardinality</u> K.CC.3. Represent a number of objects with a written numeral. K.CC.4. Understand the relationship between numbers and quantities; connect counting to cardinality. K.CC.5. Count to answer “how many” questions about as many as 20 things.</p> <p>CCSS Mathematical Practices MP.4. Model with mathematics. MP.5. Use appropriate tools strategically. MP.6. Attend to precision. MP.7. Look for and make use of structure.</p>

Seattle Art Museum images:
Thermometer, Jasper Johns, 1959,
United States, 91.97



Asmat shield, early 20th century,
Asmat (Papua New Guinea),
2004.240



Tempel Wandmalerei II (Temple wall painting II), Paul Klee, 1920, Swiss,
52.107



ICON KEY:

 = Indicates note or reminder for teacher

 = Embedded assessment points in the lesson

Prepare and Pre-Teach

Create bingo game sets: copy the bingo cards from the lesson onto white 8.5x11" card stock, one per student. Keep in sheet protector or laminate. Make a second copy of the bingo cards to cut apart – one number per card. Each set gets one complete grid and one of each of the number cards (1-9). You may wish to keep each set in a zip lock bag for storage. Set up tables with stamps and ink pads.

Practice counting objects.

Lesson Steps Outline

Day One

1. Introduce the history of using visual symbols to represent numbers of objects.

2. Introduce and guide art analysis of *Thermometer* by Jasper Johns from the Seattle Art Museum collection. Guide discussion of artwork that incorporates numbers into the composition.

3. Introduce the project, making an image in which the number of shapes in each square matches the corresponding number on the bingo grid.

 Criteria-based process assessment: Demonstrates understanding of visual representation of numbers, using the teacher example.

4. Introduce the concept of using a stamp to make multiple images of the same design or object. Demonstrate printmaking technique.

5. Guide students practicing stamping a variety of different numbers on 4 x 4" pieces of paper – to practice transferring ink and compositional choices.

 Criteria-based process assessment: Transfers ink with stamp/sponge to surface of paper.

6. Guide students through matching boxes on their bingo card with the correlated boxes on their art paper. Direct printmaking for the first three numbers, then let students finish independently.

 Criteria-based process assessment: Demonstrates understanding of relationship of bingo card to art paper before moving on to independent work.

 Criteria-based teacher checklist: Matches numbers with shapes in a group. Transfers ink with stamp/sponge to surface of paper.

Day Two

1. Introduce and guide art analysis of *Tempel Wandmalerei II (Temple Wall Painting II)* by Paul Klee and *Asmat Shield*, early 20th century, from the Seattle Art Museum collection. Introduce concept of negative space.

2. Guide students in adding background color with oil pastels.

Criteria-based teacher checklist: Fills spaces between printed shapes with color.

3. Lead the Number Quest. Ask students to find a work of art that matches the number arrangement on the bingo card they have been given.

Criteria-based self and peer assessment: Matches numbers with shapes in a group.

LESSON STEPS

Day One

1. Introduce the history of using visual symbols to represent numbers of objects.

- *How did counting begin? People counted on fingers to communicate numbers without speaking. This was important in trading since tribes and cultures had different languages.*
- *As communities grew and people farmed, numbers needed to be bigger than the amount of fingers on a hand.*
- *People started to make symbols to stand for (represent) numbers of objects. These symbols were scratched in the ground with sticks or onto a slab of clay by the ancient Babylonians.*



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2. Introduce and guide art analysis of *Thermometer* by Jasper Johns from the Seattle Art Museum collection. Guide discussion of artwork that incorporates numbers into the composition.



Responding to Art in the Classroom



■ The Seattle Art Museum's collection is available on-line at: <http://www.seattleartmuseum.org/emuseum/code/collection.asp>. To find the images in this lesson, enter the accession number for the work of art in the search box on the collections page of SAM's website. Accession numbers for these works of art are listed in the materials box at the beginning of the lesson.

- *Jump across time to right here in the 21st century. Now how do we show numbers of things? (written numerals)*
- *Who can give an example?*
- *Here is an example of a 21st century artist (Jasper Johns) using numbers in his artwork. How many numbers can you find in each half of the painting? Let's count together.*

3. Introduce the project, making an image in which the number of shapes in each square matches the corresponding number on the bingo grid.



Stamping with Geometric Foam Blocks

- *Today we are going to create artwork that shows the numbers of objects using pictures or symbols like the ancient Babylonians did.*
- *Each of you will get one of these bingo cards with nine numbers on it. There may be some that are the same arrangement of numbers but most are different.*
- *It will be your job to make art that shows these numbers as groups of objects.*

▮ Demonstrate choosing a number from a bingo card and representing it with that number of shapes on the drawing paper previously prepared with matching grid. Call students up, one at a time to do several more numbers.

Criteria-based process assessment: Demonstrates understanding of visual representation of numbers, using the teacher example.

4. Introduce the concept of using a stamp to make multiple images of the same design or object. Demonstrate printmaking technique.

- *Can you see how the big numbers might take a long time to draw? When artists want to repeat the same shape many times, they often create a stamp or stencil to make the job easier.*

▮ Demonstrate stamping a high number (above 6) with emphasis on applied pressure, amount of ink on stamp and leaving white space between stamps.

▮ Transition to work space.



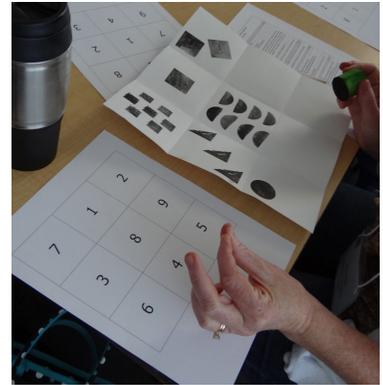
5. Guide students practicing stamping a variety of different numbers on 4 x 4" pieces of paper – to practice transferring ink and compositional choices.

- *Artists and mathematicians practice before making their finished work. We are going to practice stamping in blocks on small pieces of paper.*
- *Which stamp will you use to make the number 2? Which size stamps will fit in the box?*
- *How about the number 9? Which size stamp can you stamp nine times in the little box?*

Criteria-based process assessment: Transfers ink with stamp/sponge to surface of paper.

6. Guide students through matching boxes on their bingo card with the correlated boxes on their art paper. Direct the printmaking for the first three numbers, then let students finish independently.

- *Start with the first box in the top left corner.*
- *Put one finger on the number box on your bingo card and a finger from your other hand on the box in the same place on your art paper.*
- *How many shapes will you put in that box?*



Criteria-based process assessment: Demonstrates understanding of relationship of bingo card to art paper before moving on to independent work.

- *Choose one stamp from the middle your table. Which shape will you choose for your first number? Remember to think about how big or little your shapes need to be to fit enough prints in the box.*
- *How will you arrange your shape prints? Will you print in a line, in a circle, in rows?*
- *Artist and mathematicians plan their work before they start.*
- *Look at the number on your card that you pointed to and make that many shapes in the box on your art paper that you pointed to. I will know you are done when you put the stamp back.*



Prompting for Creativity

Repeat this step two more times providing assistance to students who need it. After guiding students through the three stamps, allow them to finish on their own.

Criteria-based teacher checklist: Matches numbers with shapes in a group. Transfers ink with stamp/sponge to surface of paper.

Day Two

1. Introduce and guide art analysis of *Tempel Wandmalerei II (Temple Wall Painting II)* by Paul Klee and *Asmat Shield*, early 20th century, from the Seattle Art Museum collection. Introduce concept of negative space.



- *The empty spaces around a shape are called negative space. How did these artists fill in the negative spaces around their shapes?*

2. Guide students in adding background designs with highlighters.

- *Today we are going to fill in the empty spaces around our printed shapes with color.*

▣ Demonstrate decoration of squares, using oil pastels to fill in negative space in the squares (this prevents students from obscuring stamps as they work around them).

▣ Return to tables, pass out artwork, and have children fill in negative space.

▣ When work time is over, have students leave their work on the tables, putting all other materials away push in chairs and stand at tables.



Criteria-based teacher checklist: Fills space between printed shapes with color.

3. Lead the Number Quest. Ask students to find a work of art that matches the number arrangement on the bingo card they have been given.

▮ Using one of the bingo cards, demonstrate finding an artwork that matches a card.

- *We're going to play a game called Number Quest. I'm going to give you a bingo card, and you need to find a work of art that either you or one of your friends made that has the same number of shapes in the boxes as the numbers on the bingo card.*

▮ Pass out the remaining cards and have students move about the room looking for artwork that is a match with their card. When a match is located, have student stand in front of the artwork and place their card next to it. (Remind students not to touch the artwork.)



Guiding Reflecting on Student Art

- *When you find a work of art that matches your bingo card, stand in front of the work of art, and put your bingo card next to it.*
- *Check with the person next to you to see if they agree it is a match.*

Criteria-based self and peer assessment: Matches numbers with shapes in a group.

Example 1 of a 'Bingo' Card

6	2	9
3	7	1
8	4	5

Example 2 of a 'Bingo' Card

4	3	6
5	9	2
1	7	8

Example 3 of a 'Bingo' Card

6	2	9
3	7	1
8	4	5

Example 4 of a 'Bingo' Card

2	8	1
3	7	9
5	6	4

Example 5 of a 'Bingo' Card

7	1	2
3	8	9
6	4	5

ARTS IMPACT LESSON PLAN Visual Arts and Math Infusion

Early Learning: *The Art of Numbers*

CLASS ASSESSMENT WORKSHEET

Disciplines	MATH	VISUAL ARTS	VISUAL ARTS	Total 3
Concept	Cardinality	Printmaking	Negative Space	
Criteria	Matches numbers with shapes in a group.	Transfers ink with stamp/sponge to surface of paper.	Fills space between printed shapes with color.	
Students				
1.				
2.				
3.				
4.				
5.				
6.				
7.				
8.				
9.				
10.				
11.				
12.				
13.				
14.				
15.				
16.				
17.				
18.				
19.				
20.				
Total				
Percentage				

What was effective in the lesson? Why?

What do I want to consider for the next time I teach this lesson?

What were the strongest connections between visual arts and math?

Teacher: _____

Date: _____

VISUAL ARTS AND MATH LESSON: *The Art of Numbers*

Dear Family:

Today your child participated in an **Arts and Math** lesson.

- We learned a little about the history of counting and how written numbers replaced groups of shapes.
- We used a printmaking process to create groups of shapes or objects that matched numbers we had on a bingo card.
- Then we filled in the negative space around the objects with oil pastels and had a number hunt with the finished artwork.

At home, you could have your child make groups of objects and write the corresponding number on a piece of paper to remind them that numbers can be expressed by written numerals or by visual representations of objects.

Enduring Understanding

Numbers can be expressed by written numerals or by visual representations of objects.