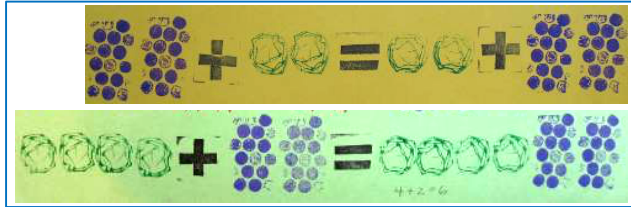


**ARTS IMPACT LESSON PLAN**

**Visual Arts and Math Infused Lesson**

**Lesson Three: *Stamping Equations***

Author: Meredith Essex      Grade Level: First



**Enduring Understanding**

Repeating shapes, textures, and symbols organized and combined in composition can represent numbers and equations.

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

*Students write and group manipulatives to show addition. African textile artworks are observed and analyzed with focus on repetition, symbol, and texture. Students explore printmaking technique using stamps made from found textural materials, then represent equations through repeating stamped images and combining them with math symbols. Final equation compositions are stamped on fabric. As an extension, students explore equivalency through linking and comparing stamped equations and determining sums greater than, equal to, or less than each other.*

**Learning Targets and Assessment Criteria**

**Target:** Shows equations.

**Criteria:** Writes and groups objects to show addition.

**Target:** Shows addition equations using repetition and symbols.

**Criteria:** Selects, counts, and stamps texture shapes and operations symbols in a row to match an equation (example  $1+2=2+1$  and  $2+1=3$ ).

**Extension:**

**Target:** Links stamped compositions to show greater than, equal to, or less than.

**Criteria:** Collaborates to make two combinations of two paper strip equations: determines equivalency/greater than/less than, (example  $3=1+2=5-2=3$ ) records equation, and shares findings.

Vocabulary	Materials	Learning Standards
<p><u>Arts Infused:</u> Repetition Symbol</p> <p><u>Math:</u> Add Equal Equation Minus Plus Subtract</p> <p><u>Arts:</u> Across Print Row Stamp Strip Texture Unity Up and down Variety</p>	<p><b>Museum Artworks or Performance:</b></p> <p><b>Seattle, WA</b> Seattle Art Museum</p> <p><b>Tacoma, WA</b> Children's Museum of Tacoma Tacoma Art Museum</p> <p><b>Materials</b> <u>Math manipulatives:</u> small countable objects; Cardstock: 8.5x11" (copy equations from lesson and cut into individual cards); Found object stamps: foam blocks no larger than 1.5x1.5" wrapped in material (netting, bubble wrap, rubber bands, corrugated cardboard, etc); Newsprint: 18x24" (practice); Stamp pads: assorted colors and black; Pastel tag board or heavy art paper: 3x36" strips (final composition); Pre-made + and = stamp sets (can be made from blocks &amp; foam); Arts Impact <u>sketchbooks</u>; Class Assessment Worksheet</p> <p><i>continued</i></p>	<p><b>WA Arts State Grade Level Expectations</b> <i>For the full description of each WA State Arts Grade Level Expectation, see: <a href="http://www.k12.wa.us/Arts/Standards">http://www.k12.wa.us/Arts/Standards</a></i></p> <p>1.1.2 Elements: Shape 1.1.4 Elements: Texture 1.1.2 Principles of Design: Repetition, Balance 1.2.1 Skills and Techniques: Printmaking 2.1.1 Creative Process 2.3.1 Responding Process 4.2.1 Connection between Visual Arts and Math</p> <p><b>Early Learning Guidelines (Pre-K – Grade 3)</b> <i>For a full description of Washington State Early Learning and Child Development Guidelines see: <a href="http://www.del.wa.gov/development/guidelines/">http://www.del.wa.gov/development/guidelines/</a> (Age 4-5) 5. Communicating: Reading: Recognize some signs and symbols in the classroom and community. (1<sup>st</sup> grade) 6. Learning about my world: Math: Add and subtract numbers up to 20. Arts: Create and respond to arts.</i></p> <p><i>continued</i></p>

**Connections**

*Everyday Mathematics*

3.6 – Adding and Subtracting on the Number Line

Seattle Art Museum images:  
*Sunday Cloth (Kwasiada Adinkra)*, 20<sup>th</sup> Century, African, 81.17.472



*Yoruba Nigerian Ogbomoso*, 1970S, Egungun (Power Concealed) costume 97.33



**Common Core State Standards (CCSS) in Math**


For a full description of CCSS Standards by grade level see:  
<http://www.k12.wa.us/CoreStandards/Mathstandards/>

- 1.OA.3. Apply properties of operations as strategies to add and subtract.
- 1.OA.5. Relate counting to addition and subtraction.
- 1.OA.7. Understand the meaning of the equal sign, and determine if equations involving addition and subtraction are true or false.

**CCSS Mathematical Practices**

- MP 4. Model with mathematics.
- MP 6. Attend to precision.
- MP 7. Look for and make use of structure.
- MP 8. Look for and express regularity in repeated reasoning.

## ICON KEY:

 = Indicates note or reminder for teacher

 = Embedded assessment points in the lesson

## Pre-Teach

Sketchbook Activity: Look for and draw repeating shapes or objects in the environment. Write equations corresponding to drawings (3 windows + 1 window = 4 windows).

## Lesson Steps Outline

### Day One


**1.** Warm-Up: Guide students to write (on white boards or paper) and arrange manipulatives in different colors to show simple addition.

 Criteria-based teacher checklist: Write and groups objects to show addition.

**2.** Introduce and guide math analysis and discussion of *Sunday Cloth (Kwasiada Adinkra)*, African, from the Seattle Art Museum collection. Discuss repetition for unity and variety for contrast. Introduce concept of texture and stamping as a technique to make a print that transfers a texture.

**3.** Demonstrate and guide stamping with found materials stamps (pre-made by wrapping mesh, packing materials, or rubber bands around blocks and/or rolling up corrugated cardboard strips) on practice newsprint paper.

**4.** Add and demonstrate using operations symbol stamps (plus and equal) and repetition of shapes/textures to stamp equations spoken and written on the board. Guide practice on newsprint.

 Criteria-based teacher checklist: Selects, counts, and stamps texture shapes and operations symbols in a row to match an equation.

## Day Two

**1.** Review concepts of symbol, texture, and repetition. Discuss idea of fabric/texture pieces combined in the Adinkra cloth and introduce *Yoruba*, *Nigerian Ogbomoso*, Egungun (Power Concealed) costume, from the Seattle Art Museum collection.

**2.** Demonstrate and guide practicing stamping using texture stamps and math symbols.

**3.** Demonstrate and guide stamping equations (provided on cards) showing addition on paper strips. Distribute an addition equation to each student.

Criteria-based teacher checklist: Selects, counts, and stamps texture shapes and operations symbols in a row to match an equation.

**4.** Extension (optional): Guide exploration of greater than, less than, and equal to through connecting fabric strips with a partner. Guide students in recording equations.

Criteria-based teacher checklist: Collaborates to make combinations of two paper strip equations: determines equivalency/greater than/less than, records equation, and shares findings.

**5.** Lead criteria-based self-assessment and group gallery walk reflection.

Criteria-based student self-assessment and group reflection: Checks to make sure that equations match stamps and symbols in art. Analyzes equations and repetition and variety seen in art.

## LESSON STEPS

### Day One

**1. Warm-Up: Guide students to write (on white boards or paper) and arrange manipulatives in different colors to show simple addition.**

- Write  $2+3=3+2$ . Choose one color to show your 2's and another color for your 3's.
- Write  $2+3=5$ . Choose two different colors of objects to show this equation.

Criteria-based teacher checklist: Writes and groups objects to show addition.

**2. Introduce and guide math analysis and discussion of *Sunday Cloth (Kwasiada Adinkra)* African, 20<sup>th</sup> Century, from the Seattle Art Museum collection. Discuss repetition for unity and variety for contrast.**



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.

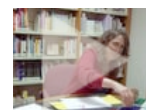
- *What do you notice? How do you think the artist(s) from Ghana in West Africa who made this cloth used math? Did they count? Did they measure? Did they add parts to make a whole?*
- *What do you see in each part of this cloth? Is there more than one of each shape?*
- *Where do you notice repetition of shapes in one place, and where do you notice different shapes? Repetition helps bring the parts of art together: variety using different shapes makes art interesting to look at.*
- *How do you think this cloth was made? All in one piece or in smaller parts combined? Talk about your ideas with a partner and share what you think with the whole class.*
- *If a shape has a bigger meaning it is called a symbol. Each shape in this cloth has a special meaning and comes from a group or community. What symbols do we use in math? ('Plus' for joining or adding and 'equal to' show the same as)*

**Introduce concept of texture and stamping as a technique to make a print that transfers a texture.**

- *Texture is how something feels. Name a texture...soft, scratchy, bumpy...*
- *Feel the stamp blocks at your table. What textures do you feel?*
- *Stamping is a way of making of a print. Have you ever put paint on your hand or finger and made a hand or finger print?*

**3. Demonstrate and guide practice stamping with found materials stamps (pre-made by wrapping mesh, packing materials, or rubber bands around blocks and/or rolling up corrugated cardboard strips) on practice newsprint paper.**

▣ Match specific texture stamps with specific color stamp pads at each table to reduce color contamination of stamps and stamp pads. Having a "pad" of 3-4 newsprint pieces under paper or fabric improves the stamped print quality.



Stamping with Found Object Texture Stamps

- *Stamping is an up and down motion. Hold your texture stamp firmly and gently press it into an ink pad. Use an up and down motion to stamp your inked shape on paper.*
- *Practice stamping in a row with the same amount of space in-between each time.*



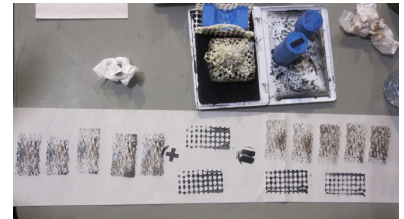
**4. Add and demonstrate using operations symbol stamps (plus and equal) and repetition of shapes/textures to stamp equations spoken and written on the board. Guide practice on newsprint.**

☐ Match all symbol stamps (plus and equal) with black stamp pads for consistency.



Prompting for Creativity

- *How can we choose stamps/colors that tell us that  $3+2=2+3$ ?*
- *Practice stamping this equation using one stamp/color for 3 and one for 2 with math symbols used in the correct places. If you have 3 mesh stamps + 2 cardboard stamps and they equal 5, then on the other side of the equal sign, you will have stamped 3 mesh stamps and 2 cardboard stamps.*
- *You can choose any two stamps that you want for your two numbers. Make sure you use the same stamps for that number on each side of the =. How will you arrange the shapes? Will you print them standing up, lying down, slanted?*
- *Stamp the equations in long rows with the same amount of space between each texture/stamp and math symbol.*



☑ Criteria-based teacher checklist: Selects, counts, and stamps texture shapes and operations symbols in a row to match an equation.

## Day Two

1. Review concepts of symbol, texture, and repetition. Discuss idea of fabric/texture pieces combined in the Adinkra cloth and introduce *Yoruba, Nigerian, Ogbomoso, Egungun (Power Concealed)* costume, from the Seattle Art Museum collection.



- *Where do you see repeating shapes or symbols? Are there places where you see different textures? Soft? Bumpy? Smooth?*
  - *How is this costume similar to the Adinkra cloth that we have already looked at?*
  - *Which places remind you of the stamped equations we have practiced?*
- 

## 2. Demonstrate and guide practicing stamping using texture stamps and math symbols.

▣ Having a “pad” of 3-4 newsprint pieces under paper or fabric improves the stamped print quality.

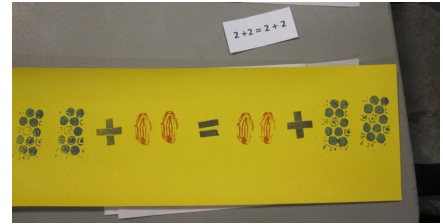
- *Remember that stamping is an “up and down” motion.*
  - *Make sure to get enough ink on your stamp to make a clear print.*
  - *Practice making rows with the same amount of space in-between each stamp.*
-



### 3. Demonstrate and guide stamping equations (provided on cards) showing addition on color paper strips. Distribute an addition equation to each student.

☐ Differentiate learning by distributing a card with an addition equation matching each student's ability level. Tape corners of two strips of 3x36" color paper on tables for each student.

- *We are stamping equations for addition.*
- *Plan how your stamped equation will look before you start: practice it on newsprint if you need to.*
- *Think about which stamp/color you will use for each number. Be sure to use the correct math symbols.*



☑ Criteria-based teacher checklist: Student selects, counts, and stamps texture shapes and operations symbols in a row to match an equation (example  $1+2=2+1$  and  $2+1=3$ ).

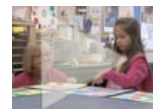
### 4. Extension (optional): Guide exploration of greater than, less than, and equal to through connecting fabric strips with a partner. Guide students in recording equations.

- *Work with a partner to connect the ends of two of your equations.*
- *Talk about whether the sums are equal (could you put an equal sign between them?) or greater or less than each other. Write that equation down on the back of your equation card and place it next to your connected fabric strips.*
- *Make another combination of equations on fabric with your partner. Are they greater than, less than, or equal to each other? Write that equation down on the back of your equation card and place it next to your connected fabric strips.*

☑ Criteria-based teacher checklist: Collaborates to make combinations of two paper strip equations; determines equivalency/greater than/less than, (example  $3+5=8 > 3+4=7$ ) records equation, and shares findings.

### 5. Lead criteria-based self-assessment and group gallery walk reflection.

- *Check to make sure that your equations match the number of stamps and symbols on your strip of fadeless art paper.*
- *Walk around the room. (Extension) Point to two equations put together that show greater than, less than, and equal amounts.*
- *Notice combinations that stand out to you because of the colors, textures, or numbers that you see.*
- *Where do you notice repetition? Where do you notice variety?*



Guiding Reflecting on Student Art

☑ Criteria-based student self-assessment and group reflection: Checks to make sure that equations match stamps and symbols in art. Analyzes equations and notes repetition and variety seen in art.

### Everyday Mathematics Extensions:

#### 5.8 – Solving Number Stories

$$2 + 2 = 4$$

$$2 + 1 = 3$$

$$3 + 2 = 5$$

$$6 + 2 = 8$$

$$7 + 1 = 8$$

$$4 + 4 = 8$$

$$3 + 3 = 6$$

$$3 + 4 = 7$$

$$1 + 5 = 6$$

$$3 + 5 = 8$$

$$2 + 4 = 6$$

$$5 + 2 = 7$$

$$2 + 2 = 2 + 2$$

$$2 + 1 = 1 + 2$$

$$3 + 2 = 2 + 3$$

$$6 + 2 = 2 + 6$$

$$7 + 1 = 1 + 7$$

$$4 + 4 = 4 + 4$$

$$3 + 3 = 3 + 3$$

$$3 + 4 = 4 + 3$$

$$1 + 5 = 5 + 1$$

$$3 + 5 = 5 + 3$$

$$2 + 4 = 4 + 2$$

$$5 + 2 = 2 + 5$$

**ARTS IMPACT LESSON PLAN Visual Arts and Math Infusion**

First Grade Lesson Three: *Stamping Equations*

**CLASS ASSESSMENT WORKSHEET**

Disciplines	MATH	VISUAL ARTS AND MATH	MATH	Total 2 (or 3)
Concept	Operations	Repetition/Symbol/ Operations	Equivalency	
Criteria	Writes and groups objects to show addition	Selects, counts, and stamps texture shapes and operations symbols in a row to match an equation	<b>Extension</b> Collaborates to make two combinations of two paper strip equations: determines equivalency/greater than/less than, records equation, and shares findings.	
Students				
1.				
2.				
3.				
4.				
5.				
6.				
7.				
8.				
9.				
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22.				
23.				
24.				
25.				
26.				
27.				
28.				
29.				
30.				
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: *Stamping Equations***

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Dear Family:

Today your child participated in a two-part **Arts and Math** lesson. We looked at African art made of cloth and talked about how the artists use repetition of shapes, textures, and symbols in these art forms. We also talked about all of the ways that math might have been used in making this art: especially measurement, counting, and addition.

- We arranged small objects to show addition.
- We explored printmaking technique using stamps made from found textural materials to make stamped prints.
- We used the stamps to show equations through repeating stamped images and combining them with math symbols for plus and equal.
- We made final addition equation compositions by stamping them on fabric or colorful paper.
- Some of us explored greater than, less than, and equal to through linking and comparing our stamped equations with a partner and determining whether our sums were greater than, equal to, or less than each other.

At home, you could notice repeating textures, shapes, and symbols—especially in fabrics. You could also encourage your child to notice addition in daily life. Together, you could show equations by combining math symbols with rubbings of objects: pennies, leaves, bottle caps.

**Enduring Understanding**

Repeating shapes, textures, and symbols organized and combined in composition can represent numbers and equations.