3 Arrays and Pointillism

Math | Art | Impressionism

KEY STANDARDS

CONTENT	ARTS
CCSS:MATH.CONT.3.OA.A.3	Art: VA.Cr1.1.3a.

PACING

DAY 1 Pages 1- 3

ASSESSMENT TYPE

☑ Formative Assessment/ Arrays and Pointillism

ELEMENTS OF ART

- Line
- Value

MATERIALS LIST

- Construction paper "Confetti" produced from a hole punch
- Grid paper
- 3x3 construction paper squares
- Hole punches
- Glue stick

Lesson Objective:

Students will learn the basics of pointillism art through the use of mathematical arrays.

Vocabulary

Array
Pointillism
Product
Negative space

21st Century Skills:

- Creativity
- Critical Thinking

Content Standards:

CCSS.MATH.CONT.3.OA.A.3.:
Use multiplication and devision within 100 to solve word problems in situations involving equal groups, arrays, and measurement quantities (e.g.: by using drawings and equations with a symbol for the unknown number to represent the problem.)
Students will work with arrays to solve multiplication equations.

Arts Standards:

VA.Cr1.1.3a.:
Elaborate on an imaginative idea.
Students will utilize colorful dots created by forming arrays, to form an imaginative pointillism artwork.

Essential Questions:

How can students relate multiplication arrays to pointillism artwork?

Warm-Up Options - 10 Min

Pick from any of the warm-ups below. To view directions for the warm-up, click the link.

- 1- Brain Connect
- 2- Color
- 3- Drawing Practice
- 4- Lettering
- 5- Line Poem
- 6- Pencils
- 7- Picture This
- 8- Sketch Stretch
- 9- Sketching from Life

3 Arrays and Pointillism

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Lesson Sequence:

In this lesson, students will work with arrays and grouping sets of numbers in multiplication through the art of pointillism.

1 STEP 1

Begin the lesson by introducing students to the Impressionist pointillism style through the Color, Shape, and Line exercise outlined below.

Ask: How do you think this painting was made?

Explain to student that pointillism is a technique of impressionist painting using tiny dots of various colors which become blended together when the viewer looks at the canvas.

Inform students that today they will be learning about math, while also learning about pointillism art.

Artful Thinking Routine

Colors, Shapes, and Lines routine. Analyze the Impressionist artwork A Sunday on La Grande Jatte by Georges Seurat (1884-86) using the following routine.

- What colors do you see?
- What shapes do you see?
- What kinds of lines do you see?

2 STEP 2

Begin by reading aloud the multiplication word problem provided in the resource pages. Walk students through the first problem about the beads. Help them to draw their arrays, and check their work.

Next, explain that arrays arrange objects in rows with the same number of objects in each row. Allow students to explore ideas, but show them how multiplying the number of rows by the number of columns is the quickest way to determine an answer. Inform students that the answer to a multiplication problem is called the "product."

Seat students in groupings so they can access materials easily. Students will not be working together on this project, but will need to share materials.

Provide each group of students with a bag containing colorful paper punched circles. Allow students about ten minutes to experiment with making multiplication equations, and using the paper circles to create arrays.

Have students paste their paper arrays in the chart on the resource pages.

Teacher To Teacher

To prepare for this lesson, use a three hole punch with a paper catch to punch holes in several pieces of colored construction paper. Then remove the paper catch and empty the paper circles into a basket or plastic bag for students to use. It is best to have one basket or bag of paper circles per student group.

3 STEP 3

Next, students will be practicing arrays while beginning to work with the fundamental concepts of pointillism.

Distribute colored markers or colored pencils. Then have students answer the questions provided on the page titled Array Practice.

As a part of each question, students should place one colored dot in each box of the array to form some sort of basic shape (circle, square, triangle, heart, etc.).

In the boxes that signify the negative space, or the space not included inside the shape, students should place a dot of a different color.

STEP 4: Main Activity/Project

Distribute pieces of grid paper, glue sticks, construction paper squares, and hole punchers, to students. Tell students they are going to make a simple pointillism image while also using the mathematical principle of arrays.

Tell students that they may place one dot in each grid on their page to create an image. To get each dot they will have to use the hole punch on one of their pieces of colored construction paper.

Demonstrate how to punch the construction paper squares to make an array. Students should use each hole they punch as a dot in their artwork.

When students are finished creating their image, have them attach their construction paper "arrays" to the bottom of their grid paper pointillism artworks.

STEP 4 CONTINUED

Have students write a multiplication equation for each construction paper square they used - using the square as an array to help them solve the equation.

Each colored square of construction paper should be a separate array and thus a separate multiplication equation.

Estimated Time: 20 minutes

5 STEP 5

To conclude this lesson, have students complete the exit ticket included in their resource pages.

Ask: What was the relationship created between arrays and pointillism artwork today?

TEACHER SCORING GUIDE

Use the rubric below to help you assess student's participation in the Arrays and Pointillism lesson.

Criteria	Distinguished (Level 4)	Excelled (Level 3)	Adequate (Level 2)	Basic (Level 1)
The student is able to use arrays to solve multiplication problems.	The student is able to accurately solve all of the example multiplication problems using arrays.	The student is able to solve most of the example multiplication problems using arrays.	The student is able to solve some of the multiplication problems using arrays.	The student is not able to accurately solve any multiplication problems using arrays.
The student understands and shares with teacher and peers the basic concepts of pointillism.	The student understands and is able to discuss the basic characteristics of pointillism.	The student seems to have a solid understanding of the characteristics of pointillism but does not share ideas with the class.	The student does not seem to have an understanding of what characteristics make up a pointillist artwork.	The student does not understand what pointillism is and does not listen to the ideas of peers.
The student is able to create a pointillist work and calculate the number of colorful points used in their image using multiplication arrays.	The student creates a detailed and creative pointillist artwork and accurately calculates the number of colorful points in their image using multiplication arrays.	The student creates a pointillist artwork and accurately calculates the number of colorful points in their image using multiplication arrays.	The student creates a pointillist artwork but does not accurately calculate the number of colorful points in their image using multiplication arrays.	The student either does not create a pointillist artwork and/or does not accurately calculate the number of colorful points in their image using multiplication arrays.

Arrays and Pointillism

Name: _____ **Date:** _____ **Class:** _____

Directions:

Use the assessment below to help you determine what you learned over the course of today's lesson about math and impressionism!

Criteria	Distinguished (Level 4)	Excelled (Level 3)	Adequate (Level 2)	Basic (Level 1)
I am able to use arrays to solve multiplication problems.	I accurately solve all of the example multiplication problems using arrays.	I solve most of the example multiplication problems using arrays.	I solve some of the multiplication problems using arrays.	I do not accurately solve any multiplication problems using arrays.
I understand and share with my teacher and peers the basic concepts of pointillism.	I understand and discuss the basic characteristics of pointillism.	I understand the characteristics of pointillism but I do not share ideas with the class.	I do not understand what characteristics make up a pointillist artwork. I do not share with the class.	I do not understand what pointillism is. I do not listen to the ideas of my peers.
I am able to create a pointillist work and calculate the number of colorful points used in my image using multiplication arrays.	I create an imaginative pointillist artwork. I accurately calculate the number of colorful points in my image using multiplication arrays.	I create a pointillist artwork. I accurately calculate the number of colorful points in my image using multiplication arrays.	I create a pointillist artwork. I do not accurately calculate the number of colorful points in my image using multiplication arrays.	I do not create a pointillist artwork. I do not accurately calculate the number of colorful points in my image using multiplication arrays.

Arrays and Pointillism

Name: _____ **Date:** _____ **Class:** _____

Multiplication Word Problems

Source: Education.com

My cousin went to the beauty salon to get her hair done. She wanted to get braids with 3 colorful beads at the end of each braid with 12 braids in all. The beautician told her to pick out the beads she wanted for her hair. My cousin thought if she had 12 braids and each braid held 3 beads, she would need 36 beads in all. She used multiplication to figure out the total number of beads she needed. She could have added: 3+3+3+3+3+3+3+3+3+3+3+3, but instead she knew that she could multiply to find the answer more quickly.

In the box below, draw an array with 12 rows with 3 beads in each row.

Draw an array of 3 rows with 5 in each row in the space below. What is the multiplication problem for this array?

What is the product of this equation? _____

Array Chart

Name: _____ **Date:** _____ **Class:** _____

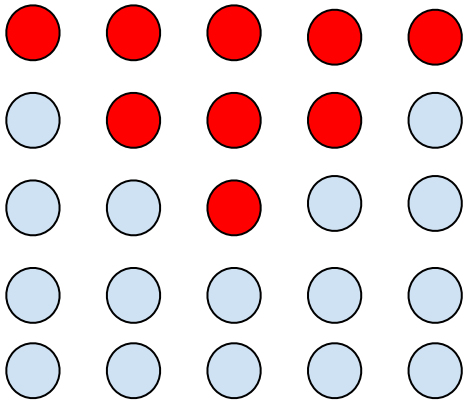
Directions: Create five different multiplication equations in the space below. Use a glue stick to attach the paper circles to your chart and create colorful arrays. Find the product of each equation.

Multiplication Equation	Array	Product

Array Practice

Name: _____ **Date:** _____ **Class:** _____

Directions: Create five different multiplication equations in the space below. Use a glue stick to attach the paper circles to your chart and create colorful arrays. Find the product of each equation.

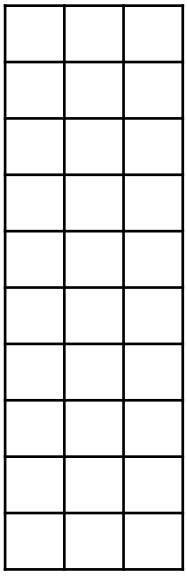


Number of rows: **5**

Number of columns: **5**

Multiplication equation: **5x5=25**

Shape made using colored dots: **Triangle**



Number of rows: _____

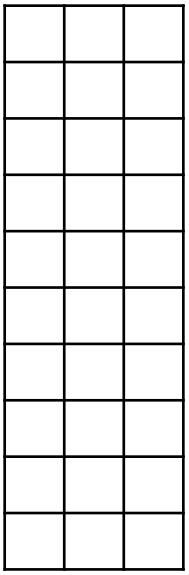
Number of columns: _____

Multiplication equation: _____

Shape made using colored dots: _____

Arrays and Pointillism

Name: _____ **Date:** _____ **Class:** _____

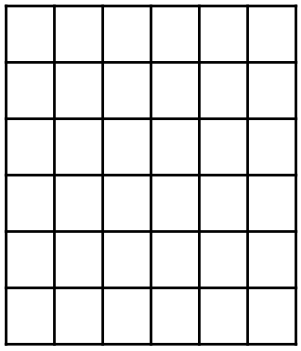


Number of rows: _____

Number of columns: _____

Multiplication equation: _____

Shape made using colored dots: _____

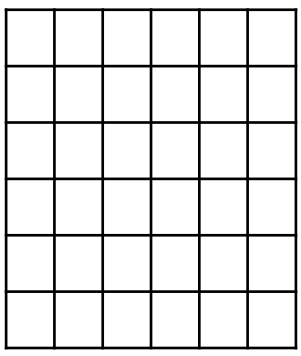


Number of rows: _____

Number of columns: _____

Multiplication equation: _____

Shape made using colored dots: _____



Number of rows: _____

Number of columns: _____

Multiplication equation: _____

Shape made using colored dots: _____

Arrays and Pointillism

Name: _____ **Date:** _____ **Class:** _____

Exit Ticket

1. How can we use arrays to solve multiplication problems?

2. Why is it important to multiply? When might you use this skill outside of the classroom?