THE EDUCATION FUND

The Shape of Art

Enhancing Student Understanding of 4th Grade Geometry Through Fine Arts

Leah Bido

320508@dadeschools.net
David Lawrence K-8
School mail code: 15000 Bay Vista Boulevard, North Miami, FL 33181

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For information concerning Ideas with Impact opportunities including
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Debra Alamo, Interim Program Manager
Ideas with IMPACT
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(305)558-4544, Ext.105
Email: dalamo@educationfund.org
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Project Purpose

About 70% of my students struggled with Geometry mastery as evidenced by their iReady data and classroom assignments. To help boost their learning, I incorporated a project based art activity where students cut out geometric shapes from fabric, painted shapes and arranged ribbons on canvas to create a mixed media art piece. The purpose of the art project was to help students achieve Geometry mastery by linking what they were learning in their textbook to a real-life application. I wanted students to leave their paper and pencil based assignments for a little while and creatively experience math in a unique way. This project is best implemented at the end of a chapter once students have had ample time to practice identifying lines, angles and shapes.

The project took a week to complete, and I witnessed shifts in student attitude as they walked in my classroom during that week. Students usually say 'Hi' as they walk in but during that week the first interaction was whether they were going to work on their project. Their enthusiasm and eagerness encouraged their other classmates to participate and boosted project productivity.

Academic Goals

You may include these goals in your lesson plans, on your classroom white board, teacher data binder, teacher data tracker or promethean board. These are the goals that this activity aims to achieve by the end of the project.

1. Increase student average achievement by 10 points on their next Geometry math quiz.

2. Class average on the topic 10 assessment of at least a 70.

3. 100 student participation on 'The Shape of Art.'

4. Increase student average iReady Geometry achievement by at least 10%.

5. Increase completed iReady Geometry lessons by 20%.

Student Friendly Objectives

These student friendly objectives are a great way for students to track what they are supposed to learn as a result of the project. These statements can also be included on your white board so students can easily see them or in their student notebooks if you want to include a reflection piece thorughout the project.

1. I can create an acute, right and obtuse triangle using ribbons, fabric or paint.

2. I can create a trapezoid, square, rectangle, rhombus, parallelogram using ribbons, fabric or paint.

3. I can create parallel, intersecting, and perpendicular lines using ribbons, fabric or paint.

4. I can arrange both quadrilaterals and polygons in a way that is visually beautiful to me.

5. I can work with my classmates in deciding how to arrange our shapes on the canvas.

6. I can identify what each quadrilateral and polygon is.

7. I can explain why quadrilaterals and polygons look different.

8. I can explain the angles and lines that each shape forms.

Florida State Standards-Visual Art and Math

VA.4.C.1.1-Integrate ideas during the art-making process to convey meaning in personal works of art.

VA.4.C.3.3-Use the art-making process, analysis, and discussion to identify the connections between art and other disciplines.

VA.4.S.1.1-Manipulate tools and materials to achieve diverse effects in personal works of art.

VA.4.S.3.1-Experiment with various materials, tools, techniques, and processes to achieve a variety of results in two- and/or three-dimensional artworks.

MAFS.4.G.1.1-Draw points, lines, line segments, rays, angles (right, acute, obtuse), and perpendicular and parallel lines. Identify these in two-dimensional figures.

MAFS.4.G.1.2-Classify two-dimensional figures based on the presence or absence of parallel or perpendicular lines, or the presence or absence of angles of a specified size. Recognize right triangles as a category, and identify right triangles.

MAFS.4.G.1.3-Recognize a line of symmetry for a two-dimensional figure as a line across the figure such that the figure can be folded along the line into matching parts. Identify line-symmetric figures and draw lines of symmetry.

Course Outline

'The Shape of Art' can be adapted to multiple settings: all students work together to create two mixed media pieces of artwork (whole class), table setting which means students work in groups of four to create one mixed media art piece per table group (group based) and lastly individual setting which means each student gets to work on their individual art piece. Individual settings are a great for small groups, and for students who need more intervention with teacher support.

This project is a mixed media art project, which means that students are going to have different materials to work with and arrange on their canvas. Students are to bring materials from home to reduce out of pocket costs. Canvas and/or mixed media paper will likely have to be bought unless students have these items at home as well. This project will take about a week to finish, and will likely take up the entire Math block on a schedule.

The week before the project-prepare and send home letters to parents explaining the project (a template for your convenience is included) or a class dojo message. All materials must be brought in by the day you choose to start the project.

Day 1 (Monday)- Collect all materials, assign roles for each student so that everyone participates. By the end of the class, students are to have a design template ready to work on for the week.

Day 2 (Tuesday)- Students will spend this day cutting out fabric, deciding where ribbons will go, cutting out newspaper, preparing the canvas.

Day (Wednesday)-Students will spend this day painting shapes on their canvas.

Day (Thursday)-Students will spend this day gluing all their cut out materials on the canvas.

Day 5 (Friday)- Students will complete a reflection journal prompt (worksheet is provided in the following page) and have the opportunity to share their thoughts on the project.

The week after the project-Administer any assessments or quizzes that test student knowledge on Geometry content. Students will need to be monitored throughout this project to ensure proper use of material. Also record student iReady use for Geometry domains.



(Insert date)

(Insert school name)

Dear Parents,

We are starting an exciting class art project called ‘The Shape of Art’! This project gives your child the opportunity to unleash their creativity and guides their learning. Students will gain a better understanding of Geometry by creating a collage out different shapes and lines, painting different triangles and squares and arranging everything together on canvas. The finished product is a colorful art piece that connects Math and Art.

Please allow your child to bring any newspaper, magazine, fabric, felt or other craft materials such as feathers, ribbon and paint. We are also in need of canvas or mixed media paper, strong glue (such as gorilla glue or super glue), rulers and scissors. If you have these items to donate towards our classroom project, please let me know as soon as possible. Materials are due by (insert date).

Thank you very much!

Sincerely,

(Insert your name)
(Insert your email)
(Insert your school phone number)

I am sending the following materials (please circle each item)

Strong glue	Canvas	Newspaper
Ruler	Mixed Media Paper	Magazine
Paint	Ribbon	Felt
Paint brushes	Fabric	Miscellaneous craft items



My Thoughts Journal Prompt

Name:

Date:

Directions: In one paragraph describe what your project was about. What was your favorite part of the project and why? What was your least favorite part of the project and why? What areas of the project could have gone better? How did you feel about the activity and working together with your classmates?

In this space below, draw and color your favorite shapes.

Course Overview

The following steps are adapted for whole class, group or individual settings. The only variable changing in whole class, group and individual settings are the materials being used and the material amounts. If a teacher is choosing to use this as a differentiated instructional activity, students will need to complete the project individually, preferably in small groups so that the teacher can give appropriate interventions.

Step 1: Students will design a template of where shapes, fabric, ribbons will go

Step 2: Once students are satisfied with their template design, they may start painting their shapes.

Step 3: Once the paint is dry, students may begin cutting out shapes using felt and fabric.

Step 4: Students will glue the fabric, ribbons, buttons and other materials on the canvas.

Step 5: Once dry, teacher will cover brush the entire canvas with a protective coating of modge podge or liquitex finishing solution. This is to ensure that beads, feathers or fabric don't fall off, prevents color fading and protects the art work.

Step 6: Once the canvas is completely dry, students can decide where to hang their art piece.

Grading Rubric

Criteria	Point Value
Templates are complete.	10%
Students all worked together and participated in creating their art piece.	30%
The art piece has at least: 1 set of parallel lines, 1 set of intersecting lines, 1 set of perpendicular lines, 3 examples of polygons, 3 examples of quadrilaterals.	50%
The final art piece is presentable and colorful.	10%
Total:	100%

Lesson Plans

Day: _____ Date: _____ Subject: _____Math_____ Period: _____ ___Grade: __4_____

	Primary Benchmark: VA.4.S.3.1	Lesson Objectives/ Additional Benchmarks: (Choose from any of the ones provided in the resource packet)	Essential Question: (Choose from any of the ones provided in the resource packet)

Essential Vocabulary:	Higher Order Questions:
Quadrilateral, polygon, parallel lines, perpendicular lines, intersecting lines, trapezoid, rhombus, square, rectangle, parallelogram, acute triangle, right triangle, obtuse triangle.	What are the similarities and differences between all quadrilaterals? How can we create a quadrilateral using polygons?

Opening Activity:	Whole Group/ Core Instruction Daily Lesson: Textbook Correlations and/or Supplemental Activities Textbook Page (s): _ GoMath Ch.10 Test pg._10-19_____ Activity/Lessons:
Vocabulary review of all geometric words. This can be in the form of a whole group vocabulary game such as Kahoot!	At the start of each math lesson, complete a couple of problems from their Ch.10 test as a class. This serves as a warm-up, and spiral review . Students should already have a basic understanding of Geometry, and preferably already went through Ch.10 of GoMath which covers 4th grade Geometry, prior to starting this project.

Data Driven Differentiation: (Data used for Differentiated Instruction/Include in Data Binder)

iReady Data **Baseline** **GoMath Resource** **Topic Assessment** **Other: _____**

Differentiated Instruction Small Group: Intensive Assignment (s):	Differentiated Instruction Small Group: Proficient Assignment (s):	Differentiated Instruction Small Group: Enrichment Assignment (s):
_____ ____Review geometry vocabulary using flip cards (definition on one side, word on the other). _____ _____	_____ _Match the right vocabulary word to the right drawing._____ _____	_____ _____Teacher tells the word, student draws it on their mixed media paper. _____ _____

Closing Activity:	Assessments/Progress Monitoring:	Home Learning:
Journal Prompt	Student work during small group activity, table group activity or whole group activity. Make sure to administer the Topic 10 assessment and/or quiz/test at the end of the project.	Daily math logs, iReady.

Resource List

Whole Class	Group Based	Individual
Strong glue (such as super glue or gorilla glue) (1 bottle) *teachers may also use hot glue but students will not use it due to safety hazard	Strong glue (such as super glue or gorilla glue) (1 bottle) *teachers may also use hot glue but students will not use it due to safety hazard	Strong glue (such as super glue or gorilla glue) (1 bottle) *teachers may also use hot glue but students will not use it due to safety hazard
Finishing solution (modge podge or liquitex) (1 bottle)	Finishing solution (modge podge or liquitex) (1 bottle)	Finishing solution (modge podge or liquitex) (1 bottle)
Acrylic paint set (primary colors) (2 sets)	Acrylic paint set (primary colors) (2 sets)	Acrylic paint set (primary colors) (2 sets)
Large canvas (2)	Medium sized canvas (4-5)	Mixed Media Paper (enough for each student)
Paintbrushes (2 sets)	Paintbrushes (2 sets)	Paintbrushes (2 sets)
Scissors (enough for students to share)	Scissors (enough for students to share)	Scissors (enough for students to share)
Craft materials (students bring from home)	Craft materials (students bring from home)	Craft materials (students bring from home)
Rulers (enough for students to share)	Rulers (enough for students to share)	Rulers (enough for students to share)

The total cost for project implementation: 50-200 depending on how many materials students bring in. These materials can be found at your local arts and crafts store. The item most likely to be out of cost is the following: canvas, finishing solution, and strong glue. There is also a possibility that students may not bring any materials or not enough. If that is the situation, this project can be modified to incorporate other art supplies that are cheaper and more readily available. If these items are already in your classroom, please use them to cut project costs. Below is a swap of the more expensive art materials for those that are easier to access and cheaper:

Instead of	You Can Use
• Paint	• Colored pencils or crayons
• Fabric and felt	• Newspaper or magazine
• Beads and buttons	• Stickers
• Ribbons	• Yarn

Changing the Way We Think About Geometry

Throughout history, artists strove to depict reality, beauty and human expression through visual platforms. Early artists concerned with depicting reality, needed space perception, balance and proportion to make objects look as real as possible. As a result, artists indirectly became mathematicians in measuring object relation, distortion, and ratio. Likewise, artists who were

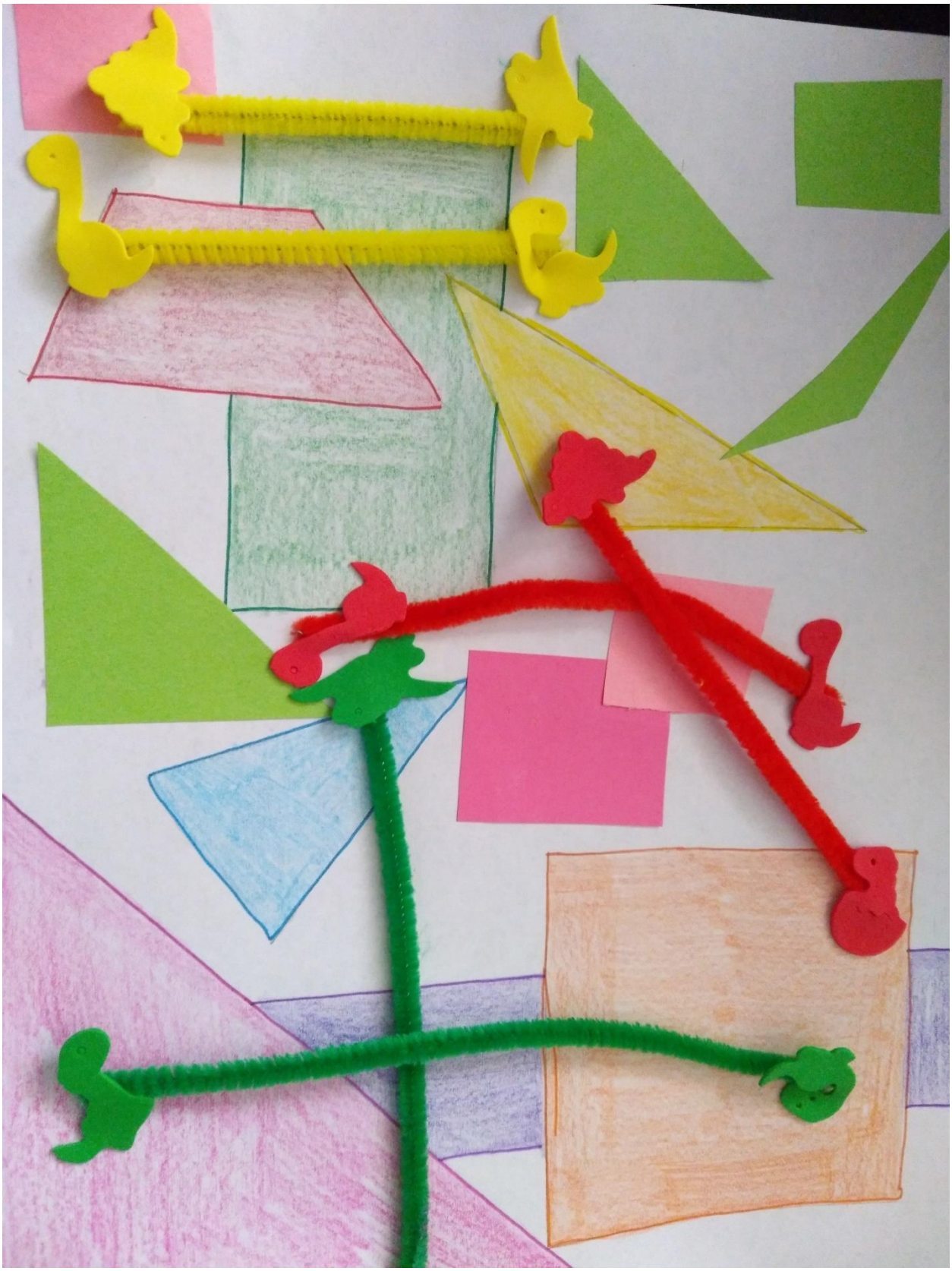
concerned with beauty found themselves studying symmetry, patterns and balance. All of these considerations have, and still affect artists of all disciplines.

The potential effect in integrating this information for students in our classrooms today is paramount in that it can completely change the way teachers teach Math, and the way students learn it. The first key point is that Math and Art are interrelated. Imagine teaching ratio using flower arrangements instead of a table with single-digit numbers, or students practicing number sequences using colored shape blocks instead of worksheets. These examples give elementary aged children concrete opportunities to build their knowledge of math in a visual, colorful and exciting way outside of paper and pencil. The second key point is that effective teaching involves connecting ideas. For example, Student A that is sketching their dream house is going to be more interested in learning about angles versus a Student B who is asked to simply copy notes on the types of angles that exist. As the math lesson continues to build in complexity, Student A is going to better link, recall and apply information than Student B because Student A has connected angles to a purpose (building a home). Lastly, integrating Math and Art can help students feel confident about their mathematical abilities and create a positive learning environment.

Research Findings: The Implications of Art for Our Students

In *The Muses Go To School*, author Herbert Kohl states that "The arts are not just for people who become artists. They are integral to the development of self-confidence, character, creativity, a capacity to deal with tragicomic nature of life, and, fundamentally, the capacity to reach deep into yourself and draw upon your own inner strengths to solve problems in difficult times." Our schools serve students who are culturally and linguistically diverse, whose socioeconomic and home environment varies, and whose academic capabilities differ. With so much diversity in our classrooms, art can be the unifying medium that helps students can feel better about themselves, and their academic abilities regardless of their circumstances.

Example #1: Individual student work with alternative materials



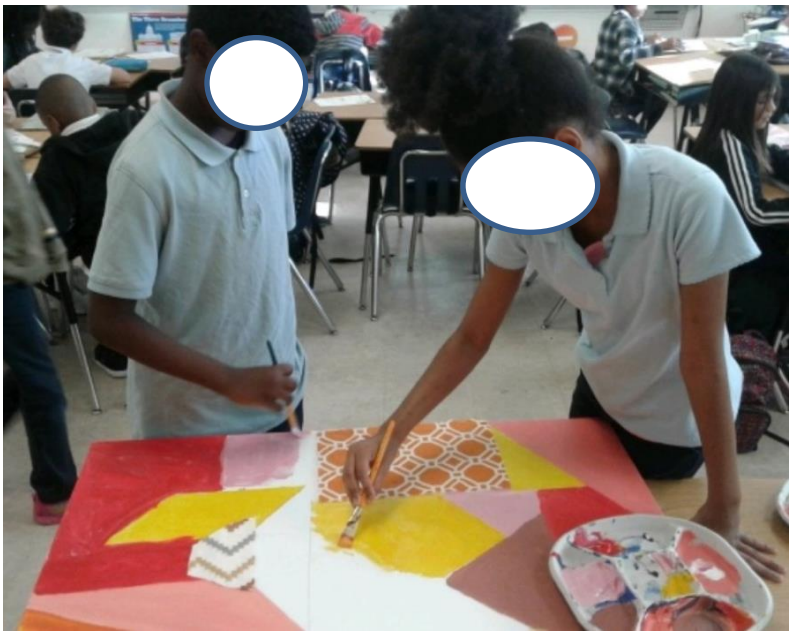
Example #2: Individual student work with suggested materials (paint, craft supplies, newspaper, felt)



Example #3: Group (table) work with suggested art supplies









Example #4: Whole class art project on canvas, with the final product shown above. Whole class project should be more elaborate, detailed and thought out than group or individual art pieces. Student faces are whited out to protect privacy.

References

Kohn, H.,Oppenhein, T. (2012) *The Muses Go To School.* The United States, NY: The Stella Adler Studio of Acting, The New Press NY.