

5E Arts Integration

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## Quadrilateral Art – a 5E Arts Integration Lesson Plan

**Standards**

Pennsylvania uses the Pennsylvania Department of Education’s Standards Aligned System (PASAS) (2019). I have identified the Pennsylvania Core Standards addressed in the lesson, however, similar standards are addressed in the Common Core and other state-aligned systems.

PASAS Math Standards Addressed:

M03.C-G.1.1.1 Explain that shapes in different categories may share attributes and that the shared attributes can define a larger category.

M03.C-G.1.1.2 Recognize rhombi, rectangles, and squares as examples of quadrilaterals and/or draw examples of quadrilaterals that do not belong to any of these subcategories.

PASAS Technology and Engineering Standards Addressed:

S3.A.2.2.1 Identify appropriate tools or instruments for specific tasks, and describe the information they provide and making observations.

3.4.3.C1 Recognize design is a creative process and everyone can design solutions to problems.

3.4.3.E4 Recognize that information and communication technology is the transfer of messages among people and/or machines over distances through the use of technology.

National Core Arts Standards Addressed:

VA:Cr1.1.3a Elaborate on an imaginative idea.

VA:Cr1.2.3a Apply knowledge of available resources, tools, and technologies to investigate personal ideas through the art-making process.

VA:Cr.2.1.3a Create personally satisfying artwork using a variety of artistic processes and materials.

VA:Cr2.2.3a Demonstrate an understanding of the safe and proficient use of materials, tools, and equipment for a variety of artistic processes.

**Art Integration**

This lesson is designed as an opportunity for students to strengthen their understanding of the attributes of quadrilaterals standard. Students will use visual arts to demonstrate their mastery of the standard by creating geometric artwork (exact instructions provided in lesson plan template). The role of the teacher in this lesson is designed to be a facilitator. Instead of providing direct instruction, the teacher is asking questions, posing thoughts, and helping troubleshoot in order to move student thinking along. Conversely, it could also be used as a culminating project and summative assessment for the standard depending on classroom needs. Based on available supplies, students may choose from use drawing, painting, sculpture, and collage.

Suggested supplies are:

- 9" x 12" construction paper in a variety of colors
- 12" x 18" construction paper in a variety of colors
- Graph paper
- Colored markers, crayons, and pencils
- Rulers
- Washable watercolor paint
- Paintbrushes
- Small cups of water and paper towels (for cleaning brushes)
- Modeling clay
- Playdough
- Old magazines and catalogs
- Scissors
- Glue sticks

### **Justification**

When teaching a new math concept, I typically follow a concrete to pictorial to abstract model. It is my belief that following this method is an effective way to grow student understanding of a concept. For this 5E Arts Integration lesson, I have identified that the pictorial step of this progressive model is an ideal place to institute art into math.

In my years as a third grade teacher, I have seen students struggle with geometry time and time again. In particular, the concept of classifying quadrilaterals is challenging. As teachers, we

have to shift them from thinking a shape can only belong to one “category” and that, in fact, they can belong to many – squares are rectangles, rectangles are parallelograms, parallelograms are quadrilaterals, it’s a lot for their eight and nine-year old brains to wrap around. After allowing them to handle concrete models and looking at pictorial models of these shapes, allowing them an opportunity to *create* with these shapes is an ideal way to advance their mathematical thinking on the topic.

To build explore the topic and background knowledge, show students the works of different geometric artists. If time and curriculum allows, teachers can also bring in literacy by reading about the artists.

- Charley Harper, a graphic artist raised on West Virginia farm (Charley Harper Art Studio, 2019).
- Bryce Hudson, an abstract geometric Moroccan-American artist (Bryce Hudson, 2016).
- Alison Kunath, a travel-inspired artist known for her geometric murals (“Living and Working Where it Feels Right,” n.d.).
- David Krueger, a geometric-style artist at The Arts of Life, an art studio for adults with disabilities (The Arts of Life, 2019).

### **Measureable Objectives**

The objectives identified will be measured by using the Quadrilateral Art Lesson Rubric.

- Students will be able to classify and organize four types of quadrilaterals (trapezoids, rhombi, rectangles, and squares).
- Students will be able to create a personally satisfying visual arts representation using available supplies.
- Students will be able to use technology to capture, share, and explain their artwork with others.

### **Lesson Procedure**

This lesson builds upon Go Math! Curriculum’s lesson *12.5 Classify Quadrilaterals* (Houghton Mifflin Harcourt Publishing, 2015).

Agenda	Materials	Overview
<p><b>ENGAGE (10 minutes)</b></p> <p>The purpose for the ENGAGE stage is to pique student interest and get them personally involved in the lesson, while pre-assessing prior understanding.</p>	<p>Graph paper Rulers</p>	<p><b>Essential Question</b> How do artists use quadrilaterals in their artwork?</p> <p>Invite students to tell you what they know about quadrilaterals. What quadrilaterals do you have we learned about? What do squares, rectangles, rhombuses, and trapezoids have in common? What is different about these shapes?</p> <p>Have students use graph paper and rulers to draw 5 to 10 four-sided figures. Have them write about the characteristics that they notice about their figures.</p>
<p><b>EXPLORE (15 minutes)</b></p> <p>The purpose for the EXPLORE stage is to get students involved in the topic; providing them with a chance to build their own understanding.</p>	<p>Artwork samples:</p> <p><a href="#">Charley Harper</a> <a href="#">Bryce Hudson</a> <a href="#">David Krueger</a> <a href="#">Alison Kunath</a></p>	<p>Show students multiple examples of geometric art from several artists.</p> <p>Discuss:</p> <ul style="list-style-type: none"> <li>• What do you see in these pieces of art?</li> <li>• What types of quadrilaterals did the artist use? What is true about all quadrilaterals?</li> <li>• How are the quadrilaterals different? Where do you see rectangles? Rhombi? Trapezoids? Squares? Why do you think he or she chose that shape?</li> <li>• How does the use of a shape enhance or help their artwork?</li> <li>• What other shapes, polygons, or quadrilaterals could be used?</li> </ul>
<p><b>EXPLAIN (20 minutes)</b></p> <p>The purpose for the EXPLAIN stage is to provide students with</p>	<p>Quadrilateral lesson rubric</p> <p>Sketch paper Pencils</p>	<p>Provide students with a copy of the attached Quadrilateral Art Lesson Rubric. Review expectations of the assignment.</p> <p>Explain that they will have the allotted time to create their own quadrilateral art similar to the artists they just viewed. They can use the artists’ work as inspiration for their own creation or they may come up with something different.</p>

<p>an opportunity to communicate what they have learned so far and figure out what it means.</p>		<p>Discuss available supplies and explain they may choose from drawing, painting, sculpture, and collage.</p> <p>Allow students think time to choose which art form they will be selecting.</p> <p>Students should draw a preliminary sketch to show their ideas on paper and list the supplies they will need. After review by teacher, they may move into the Elaborate stage.</p> <p>Remind students of the Rubric expectations during the sketching phase.</p>
<p><b>ELABORATE</b> (45 minutes to 1 hour)</p> <p>The purpose for the EXTEND stage is to allow students to use their new knowledge and continue to explore its implications.</p>	<p>Art supplies: 9" x 12" and 12" x 18" construction paper in a variety of colors</p> <p>Colored markers, crayons, and pencils</p> <p>Rulers</p> <p>Washable watercolor paint</p> <p>Paintbrushes</p> <p>Small cups of water and paper towels (for cleaning brushes)</p> <p>Modeling clay</p> <p>Playdough</p> <p>Old magazines and catalogs</p> <p>Scissors</p> <p>Glue sticks</p>	<p>As students create their artwork, circulate the room and facilitate deeper understanding by asking a variety of Depth of Knowledge questions:</p> <p>Level 1:</p> <ul style="list-style-type: none"> <li>• Can you show me where you used a square? Rectangle? Trapezoid? Rhombus?</li> <li>• What is the name of this shape (pointing to a particular shape)?</li> </ul> <p>Level 2:</p> <ul style="list-style-type: none"> <li>• How are your squares and trapezoids (or two others shapes) different?</li> <li>• How might you use a rectangle in this artwork?</li> </ul> <p>Level 3:</p> <ul style="list-style-type: none"> <li>• Can you elaborate on why you chose this shape?</li> <li>• Why does that shape help your artwork?</li> </ul> <p>Level 4:</p> <ul style="list-style-type: none"> <li>• How else could you use a square? Rectangle? Trapezoid? Rhombus?</li> <li>• What changes could you make to that rectangle to turn it into a square? Etc.</li> </ul> <p>As students work use Math Talk to focus on comparing properties of quadrilaterals to classify them. Suggest students use a ruler to determine if sides are or are not equal in length. Students may also use the corner of a piece of paper to help decide if an angle is a right angle.</p>

<p><b>EVALUATE</b> (20 minutes)</p> <p>The purpose for the EVALUATION stage is for both students and teachers to determine how much learning and understanding has taken place.</p>	<p>iPads or Kindles</p>	<p>Revisit the essential question and allow students to discuss: How do artists use quadrilaterals in their artwork?</p> <p>Have students think about their process and final artwork. Explain to a partner their answer the Essential Question.</p> <p>Using iPads or Kindles, allow time for students to upload a video or photo of their artwork and an explanation of how they used quadrilaterals in their artwork.</p> <p>Provide students with time to fill out student side of the Quadrilateral Art Lesson Rubric.</p>
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**Lesson Rubric**

This holistic rubric is designed to allow students to be aware of the expectations of the assignment and allow for reflection at the end of the assignment. Even in third grade, I believe that giving students the opportunity to see the rubric ahead of time gives them an opportunity to be an active learner and take full ownership. At the end, it allows them time for reflection and future opportunities for growth.

The rubric has components for math, technology, and visual arts standards and is worded in measurable objectives. It is easily adaptable to any lesson, objectives, or standards and points can be increased or decreased depending on weight of assignment. As this rubric was creative for a exploration assignment, not a summative assessment, the math objectives are not being measured by mastery, but rather evidence of learning. With all the discussion on “measuring creativity,” I wanted to make sure that the art objective was encouraging creative minds, not measuring their ability to glue or cut. Lastly, the technology section reflects the type of technology used in my classroom, Kindles and the Class Dojo app. This student-friendly app allows kids to share their work on their portfolio and is accessible to their adults via any smartphone, tablet, or computer.



Quadrilateral Art Lesson Rubric

Student Score	Rubric Item	Teacher Score
	<u>MATH OBJECTIVE:</u> Student will be able to classify and organize all four quadrilaterals (trapezoids, rhombi, rectangles, and squares) as examples of quadrilaterals.	
3	Used examples of ALL quadrilaterals (trapezoid, square, rectangle, and rhombus)	3
2	Used examples of 3 quadrilaterals (trapezoid, square, rectangle, and rhombus)	2
1	Used examples of 2 quadrilaterals (trapezoid, square, rectangle, and rhombus)	1
0	Used more examples of 1 or no quadrilaterals (trapezoid, square, rectangle, and rhombus)	0
	<u>OVERALL MATH SCORE</u>	
	<u>ART OBJECTIVE:</u> Student will be able to create a personally satisfying visual arts representation using available supplies.	
3	I did my best work. I put forth total effort. I can say “I love my art!”	3
2	I did a pretty good job. I put forth some effort. I can say, “I like my art.”	2
1	I did not try my best. I did not put forth effort. I can say, “I could have tried harder.”	1

	<u>OVERALL ART SCORE</u>	
	<u>TECHNOLOGY OBJECTIVE:</u> Student will be able to use technology to capture, share, and explain their artwork with others.	
2	Uploaded and explained artwork on Class Dojo	2
1	Uploaded but did not explain artwork on Class Dojo	1
0	Did not upload artwork on Class Dojo	0
	<u>OVERALL TECHNOLOGY SCORE</u>	
	<u>OVERALL QUADRILATERAL ART LESSON SCORE (out of 8)</u>	

References

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