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Integrating Art Into a Math Curriculum

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A Capstone Project for the Bachelor of Arts in Human Development and Family Studies

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Introduction

Many schools follow a specific curriculum to teach state standards and expect students to grasp all information taught in a traditional manner. Art integration is an approach of teaching students and providing subject matter content (e.g., math) demonstrating through an art form. Given the range of how children learn, art may be a method of teaching content that is more motivational than a traditional approach. To address this, I will be conducting a 2-day curriculum teaching math while using art integration to a first-grade class at Martin Luther King Jr. Elementary School in Seaside, California.

Need Statement

One way that schools could help further their student's education is by integrating art into their curriculum. Brezovnik (2015) defines art integration as "an approach to teaching in which students construct and demonstrate understanding through an art form. Students engage in a creative process which connects an art form and another subject area and meets evolving objectives in both" (p.14) Although there have been studies demonstrating how art integration could be valuable within children's education, schools are still not implementing this into their curriculum. Teachers are not being trained on how to implement art into their curriculum. Art integration could benefit students who have a difficult time learning and promotes a more enjoyable approach of learning.

One conflict that makes integrating art into a curriculum challenging is the lack of teachers who have been trained. Teachers who will integrate art into their classrooms need to have the proper certification, training, and sufficient knowledge. In some schools' teachers who are teaching in classrooms do not hold the proper certification and are required to teach methods unknown to them. (Gullatt 2008). Art integration is more than giving students a coloring math

worksheet or making a hand turkey during Thanksgiving. It requires a lot of planning to combine two subjects together and meet the objectives of both subjects. Gullatt states "As indirect reaction to No Child Left Behind legislation further tightens the grip on educational budgets…. The district and school budget must be protected for the arts through conscious and methodological monitoring. Otherwise, past history has shown that existing funds will be diverted to other curriculum and support areas that have been the focus of the movement." (p. 22) School administrators and districts should provide professional development for all teachers in order for them to utilize art into their classrooms. This way they could utilize and teach art in the best manner.

While integrating art into classrooms could be beneficial, it is also very helpful to students who are "at risk students" (e.g. disabilities, low income, etc.). Art integration has a way of increasing their academic performance, decreasing their frequent inappropriate behavior, improving their communication, improving their level of engaging and control, and giving them a better attitude about school (Sousa, 2008 as cited in Dawson & Wright 2017). Through art integration students are able to discover brand new information. It is a way to expand a student's knowledge and creativity. It helps students understand that there is more than one way of problem solving (Gullatt 2008). In 2016 the President's Committee on the Arts of Humanities funded a "Turnaround Arts Program" in high poverty areas where they integrated art to programs. Throughout the program they were able to see an increase in scores. Math proficiency was up 23% and Reading scores were up 13%. By the end of the program they found improvement in academics, attendance, and community-parent's engagement (Dawson & Wright 2017). Rather than writing an essay or taking a test, art integration gives at risk students a way to be creative and artistic by showing their understanding of a subject.

Art integration has also been said to be a more enjoyable approach to learning. Recent developments in both cognitive research and neuro science explain the significant power art has to teaching and learning in a variety of ways (Gullatt 2008). It is important for students to learn necessary lessons such as math, science, history, etc. However, the next step should be how to incorporate art to into a lesson and make it more engaging to students. A study was done where students had to pick a specific historical time period to research. Using the time period chosen students were asked to make a panorama illustrating the time period. Students were also asked to dramatize the time period they had illustrated in their panorama. Rather than learning from a standard lecture and a test following. Through this method, students were not only more engaged in the topic, but retained the information longer. (Chilcoat, 1991 as cited in Gullatt 2008) In another study one student claimed that he would study for a test and memorize all the materials. Once the exam was over he would forget all the information he had memorized. However, when he constructed a project the knowledge always remained with him (Clinard & Foster, 1998 as cited in Gullatt 2008).

Given the many studies that have proven success with integrating arts into curriculum. Schools are still failing to incorporate art into their curriculum. In order to prove the increase of a student's knowledge. I will provide a 2-day math lesson incorporating art integration for first graders at Martin Luther King Elementary School in Seaside, California.

Theory Application

Howard Gardner, in his theory of Multiple Intelligence's stated that many humans have unique intelligences and identified eight distinct intelligences. The eight intelligences are Visual-Spatial, Linguistic-Verbal, Interpersonal, Intrapersonal, Logical-Mathematical, Musical, Bodily-

Kinesthetic, and Naturalistic. Through his theory and research Gardner states that within these multiple intelligences people are able to combine strengths from multiple combinations. Which make them learn, remember, perform, and understand in many different ways. Gardner states, most schools only focus on logical-mathematical and linguistic intelligences instead of all intelligences (Gullatt 2008). Gardener expresses that Visual- Spatial, Interpersonal, Intrapersonal, Musical, Bodily-Kinesthetic, and Naturalistic intelligences are important when it comes to the arts. Using this theory of multiple intelligences, it can help connect strength and increase weak areas through a diverse instruction because it provides a more active approach for students by using their specific intelligences to engage them. For this project I have chosen to focus on Visual-Spatial and Logical- Mathematical Intelligence. Those who have Visual-Spatial intelligence have the strength for visualizing things. For example, they are well informed using maps, charts, videos, and pictures. This is also known as picture smart, in which students are able to process information using imagery and pictures. Logical-Mathematical intelligence are for those who are skilled at reasoning, recognizing patterns, and logically analyze problems. I created two activities in which students would be able to use both Logical-Mathematical and Visual-Spatial intelligence to show their knowledge of shapes by creating artistic projects.

Consideration of Diversity

My participants are first graders at Martin Luther King Elementary School in Seaside, California. In this classroom there are twenty-five students in the classroom. The ratio of male and female is about evenly divided with a slightly higher ratio of males. According to the School Accountability Report Card (SARC;2019), Martin Luther King Elementary School is 1.2% African American, 1% Asian, 6.3% Filipino, 85.1% Hispanic, 2.2% Pacific Islander, and 2.7 White. In addition, 75.9% are considered Socioeconomically Disadvantaged. With the high rate

of Hispanic I would expect a high rate of Spanish-speaking students. As a result, it is possible that many of the students would understand the lesson in English but benefit more by having the lesson be bilingual. Therefore, I personally reached out to the teacher of the classroom and asked if all students were English proficient (P. Collet, Personal Communication, March 10, 2019). From her response I determined to do my lesson in English. In my project students must be English proficient because all directions will be provided in English and books read will be in English. This project is geared towards first graders because it focuses on the first-grade art and math standards. Younger students may not have been taught the necessary understanding of shapes for this project.

Learning Outcomes

I provided 2-days of 20-minute lessons to a first-grade classroom at Martin Luther King Elementary School.

By the end of the project, participants will:

1. be able to identify a variety of shapes.
2. be able to use shapes representationally as other objects.
3. demonstrate how to draw an object by highlighting a shape.

Method

Day 1:

It was time for the students to be in their reading centers. While other students were having lessons or playing vocabulary games, I was in the library area. I had 5 groups of 3 to 5 students come to my area for about 15 minutes each. I started off by saying hello to all the students. I then let them know that I would be reading a book called *Have You Seen My Monster?* I informed the students that they would see many shapes on each page. If they see a

shape to let me know and say what shape they see. If the students didn't know the shape I would say the name and have them repeat it. The story itself took about 10 minutes. On the last page of the book, there were all the shapes that the book mentioned without the names on them. I would point at each shape to determine what exact shapes the students were able to know by the end of the story.

Day 1 continued:

The students were in their math centers. Each student has an assigned group to be in. I was able to meet with all 3 groups of 8 to 10 students for about 15 minutes each. I had the students make shape pizzas. They were given a plain plate with a red circle glued in the middle. See Appendix A. They were also given a small worksheet asking the students to write down the number of shapes they used for each item on the pizza. See Appendix B. Once every student had their materials I explained that they would be making their own pizza while using shapes as toppings. I had provided shape cutouts that they could glue on or shape stickers. Many of the shapes I provided were similar to the ones from *Have You Seen My Monster*. I showed students an example pizza and explained what my favorite toppings were and how I used the shapes to help represent them. Once they understood the directions I let them start and be creative. Once they finished their pizzas I reminded all students to fill out their worksheet.

Day 2:

The students were once again in their math centers. I was able to meet with all 3 groups of 8 to 10 students for about 15 minutes each. On this day I gave each student a white piece of paper and a colored paper with 2 shapes. See Appendix C. I also asked each student to retrieve their clipboards and pencils they have. Once all students had each item I explained the directions.

Each student was asked to go around the room and find items that matched their shapes given Once they found an item they were asked to draw their shape on a white piece of paper.

Results

Learning Outcome 1 was that students would be able to identify a variety of shapes. I believe this outcome was partially met. In the book *Have you Seen My Monster (Steve Light, 2015)* each page focused on a specific shape, and there was a total of 20 shapes. I knew that the students were not going to be able to identify ten shapes from the book because they are shapes they had not learned. However, not all students were able to identify the ten shapes they had learned previously. See Figure 1 to see a chart showing the number of students that were able to identify each shape.

Learning Outcome 2 was that students would be able to use shapes representationally as other objects. I believe this outcome was met. Once the students received their instructions on the activity each one got to work. Every student started to look for shapes and chose the ones they needed to create their pizza. While placing the shapes on their pizza they were talking amongst each other explaining the type of pizza they were making and what each shape was representing. Many students made a regular vegetable topping pizza. However, other students got more creative and stated they were making a candy pizza. Once the students were finished making their pizzas every student was able to fill out the worksheet correctly. The students were able to identify the shapes they used to represent other objects. See Figure 2 for final pictures of student's pizzas. See Figure 3 for a graph explaining what shapes were used representationally as other objects in pizza toppings.

Learning Outcome 3 was that students would be able to demonstrate how to draw an object by highlighting a shape. I believe this outcome was partially met. On my first day, I

facilitated two activities, and three students were absent. On the second day when I focused on learning outcome 3, all students were present. I did realize that the three students who were not present the first day struggled understanding what they were doing. As for the other students who were present some struggled while others didn't. The task was not all the participants were able to find items around the room that were similar to their shape and needed guidance. Others were able to find shapes fairly easily but weren't able to draw the exact item and just drew the shape. There were a few students who were able to find items and draw them, while being able to highlight the shape. See Figure 4 to see a graph of the number of students who were able to highlight a shape in their drawing. See Figure 5 to see examples of student's drawings who met, partially met, and did not meet the learning outcome.

Discussion

Overall, I believe this project was successful. The students were engaged and used their creativity to accomplish the activities. Using the framework of Howard Gardner's Multiple Intelligence theory, in the project. Students were able to use both Logical-Mathematical and Spatial-Visual Intelligence. Using Spatial-Visual Intelligence students processed information using pictures and imagery and used their hands and eyes to make a creative and artistic project. While accomplishing these activities, participants were also using their Logical-Mathematical Intelligence. By being able to see and observe shapes in their environment and creating patterns using shapes. Completing a project utilizing both intelligences is consistent with Gardner's theory.

In terms of diversity, I believed my project included every student within the classroom. Except I did not speak to the teacher prior to the activities asking if there were any students with learning disabilities. I was unaware if there were any students who may have had a more difficult

time learning or who did not have knowledge on the new shapes they had learned. I also realized that many students were responding to answers in Spanish. My lesson was only in English, given that it was the language of instruction. Even though the project was successful, and the students understood the instructions. I believe it would have been more beneficial to give the lesson instructions bilingually.

If I had to do this project again, I would have liked to have more time with the students. I only had about 20 minutes with each group and I believe this did not allow much time for them to be creative. I would also like to do all activities on a table next time. All of my activities were done on the carpet which made things disorganized quickly. It also caused difficulty for me to help students who needed extra guidance. Lastly, next time I would like to focus on doing this project with students who have a more difficult time learning to test and see if art integration is a more beneficial for their own learning in comparison to traditional curriculum. Overall, I really enjoyed doing this project with the students and seeing how art integration can be combined to a subject. By doing these activities and seeing their overall projects I was able to see the knowledge of shapes each student had.

References

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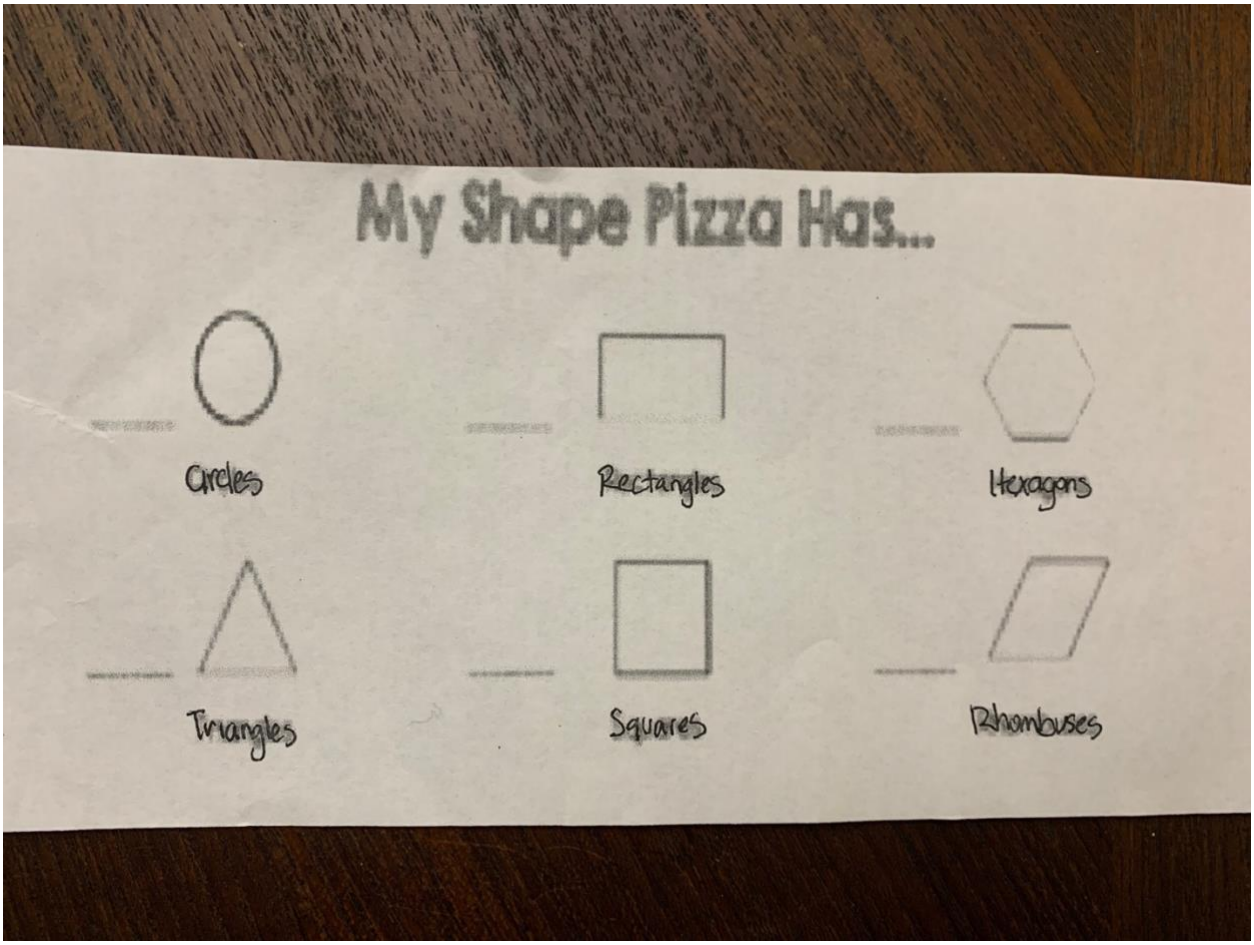
Hancock, D. R., & Wright, S. W. (2018). Enhancing Early Childhood Development through Arts Integration in Economically Disadvantaged Learning Environments. *Urban Review: Issues and Ideas in Public Education*,50, 430–446. Retrieved fromhttp://search.ebscohost.com/login.aspx?direct=true&db=eric&AN=EJ1184875&site=ehost-live

Light, S. (2016). *Have you seen my monster?* London: Walker Books.

Appendix A
Pizza plate for Learning outcome 2

Appendix B

Shape worksheet for Learning outcome 2



Appendix C

Colored paper with two shapes for Learning outcome 3

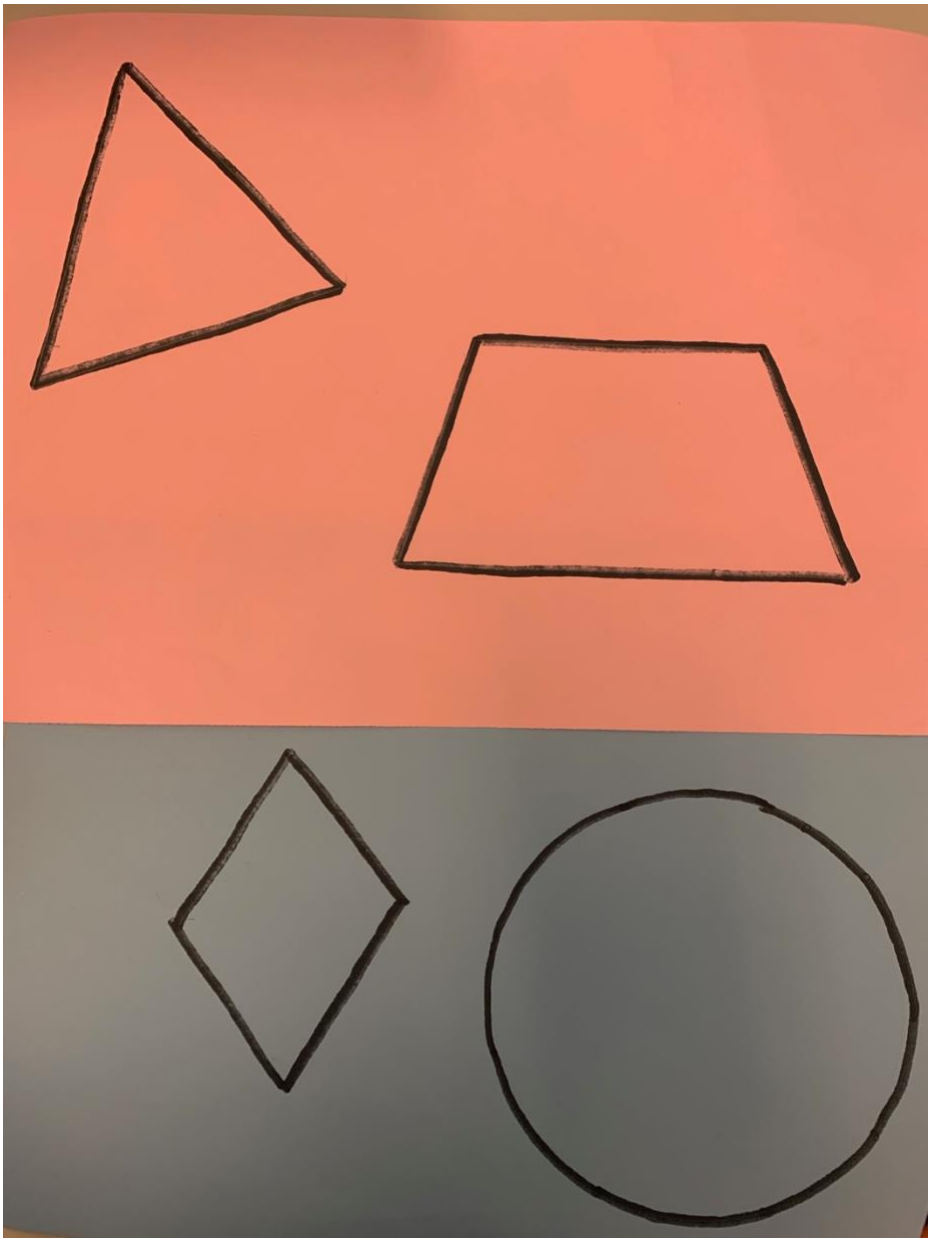


Figure 1

Chart showing the results of the number of students that were able to identify each shape

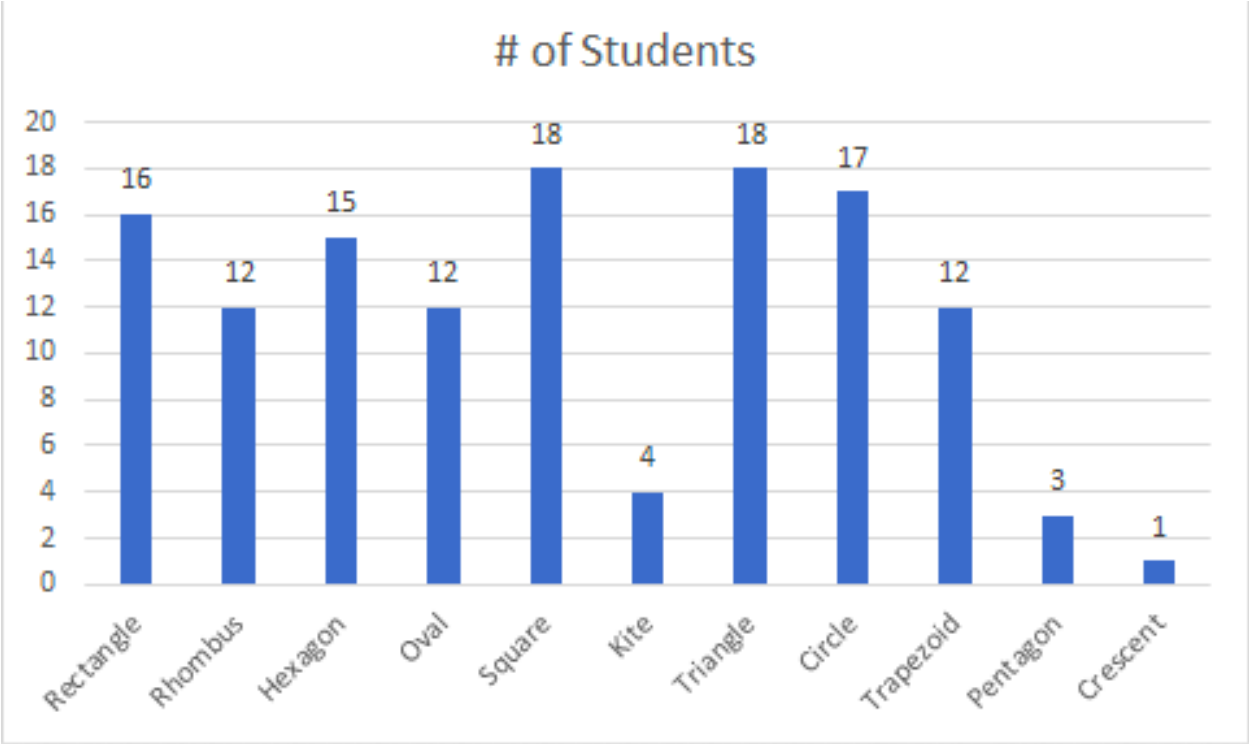
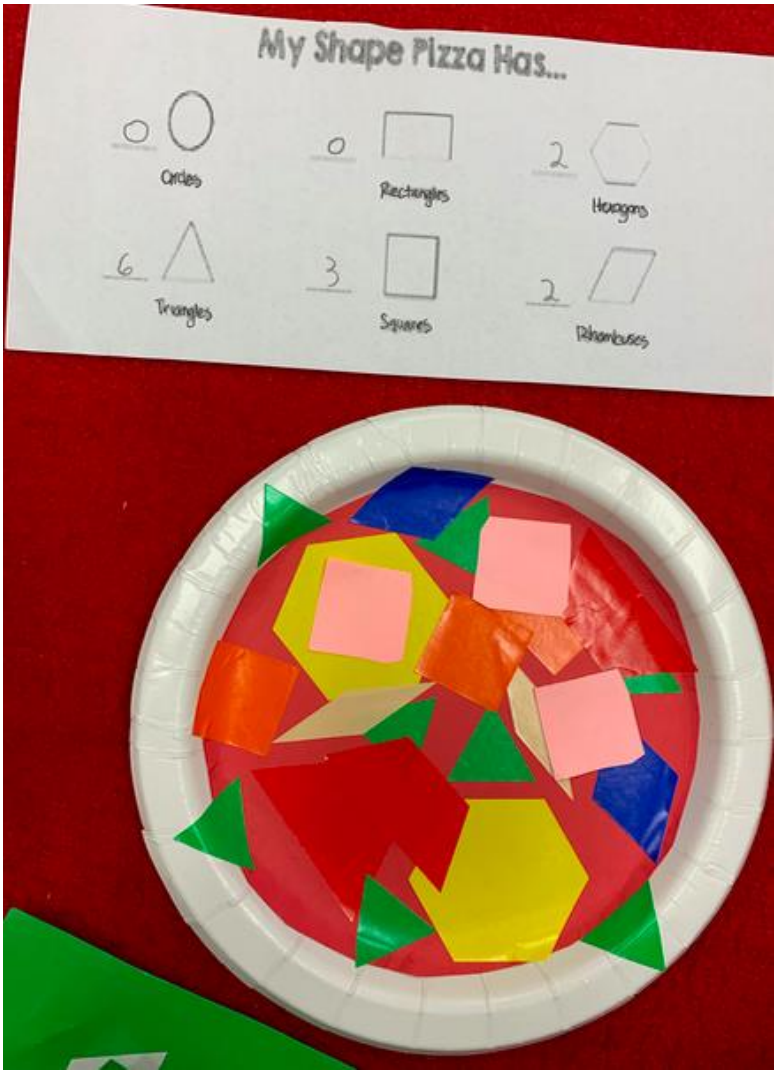


Figure 2

Final pictures of student's pizzas

Cont. Final pictures of student's pizzas



Cont. Final pictures of student's pizzas

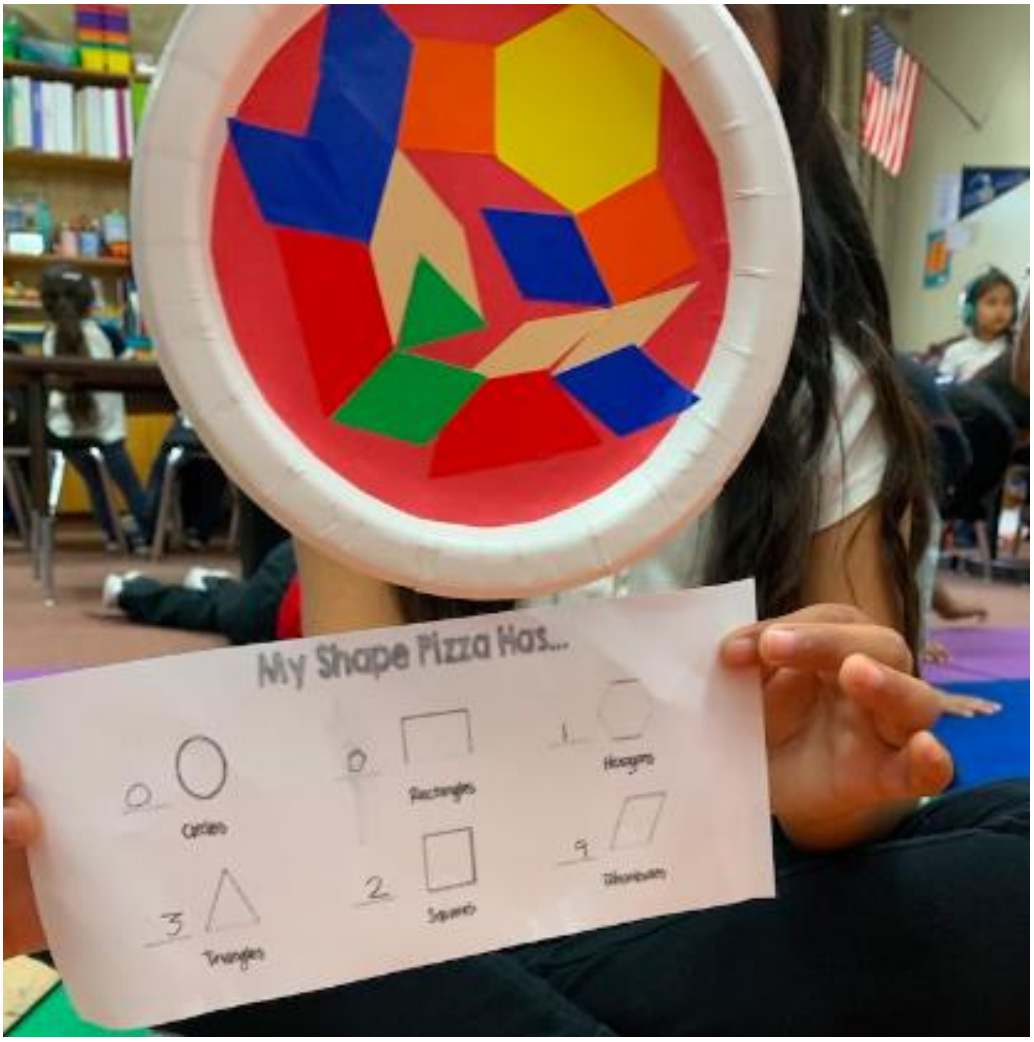


Figure 3

A chart explaining what shapes were used representationally as other objects in pizza toppings.

Shapes	Objects Represented
Circle	Pepperoni, Sausage, Strawberries
Square	Onions (cebollas), Pepperoni, Oranges, Bell Peppers
Triangle	Onions, Apple Candies
Trapezoid	Sour Strawberries, Chiles
Hexagon	Cheese, Apples
Rhombus	Peaches, Blueberries, Pineapples

Figure 4

A graph of the number of students who were able to highlight a shape in their drawing.

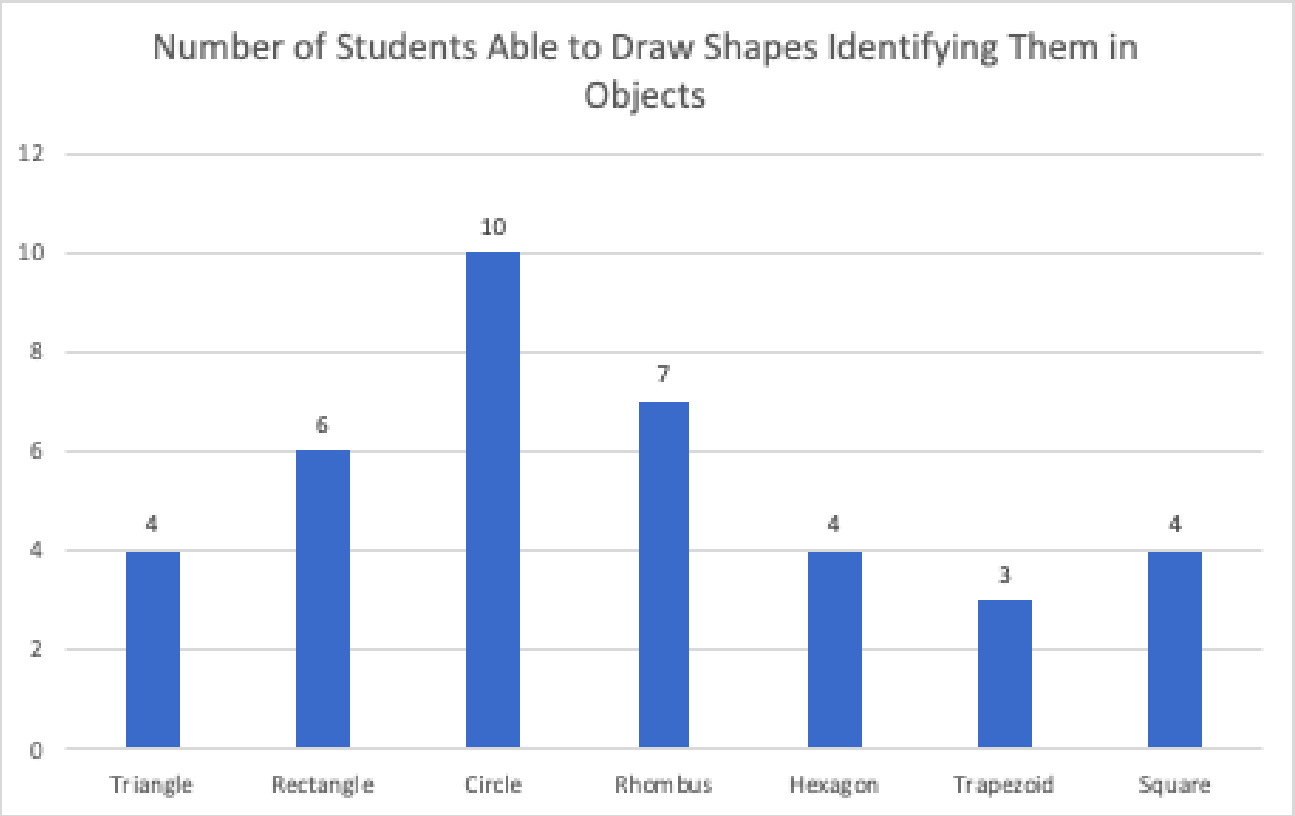
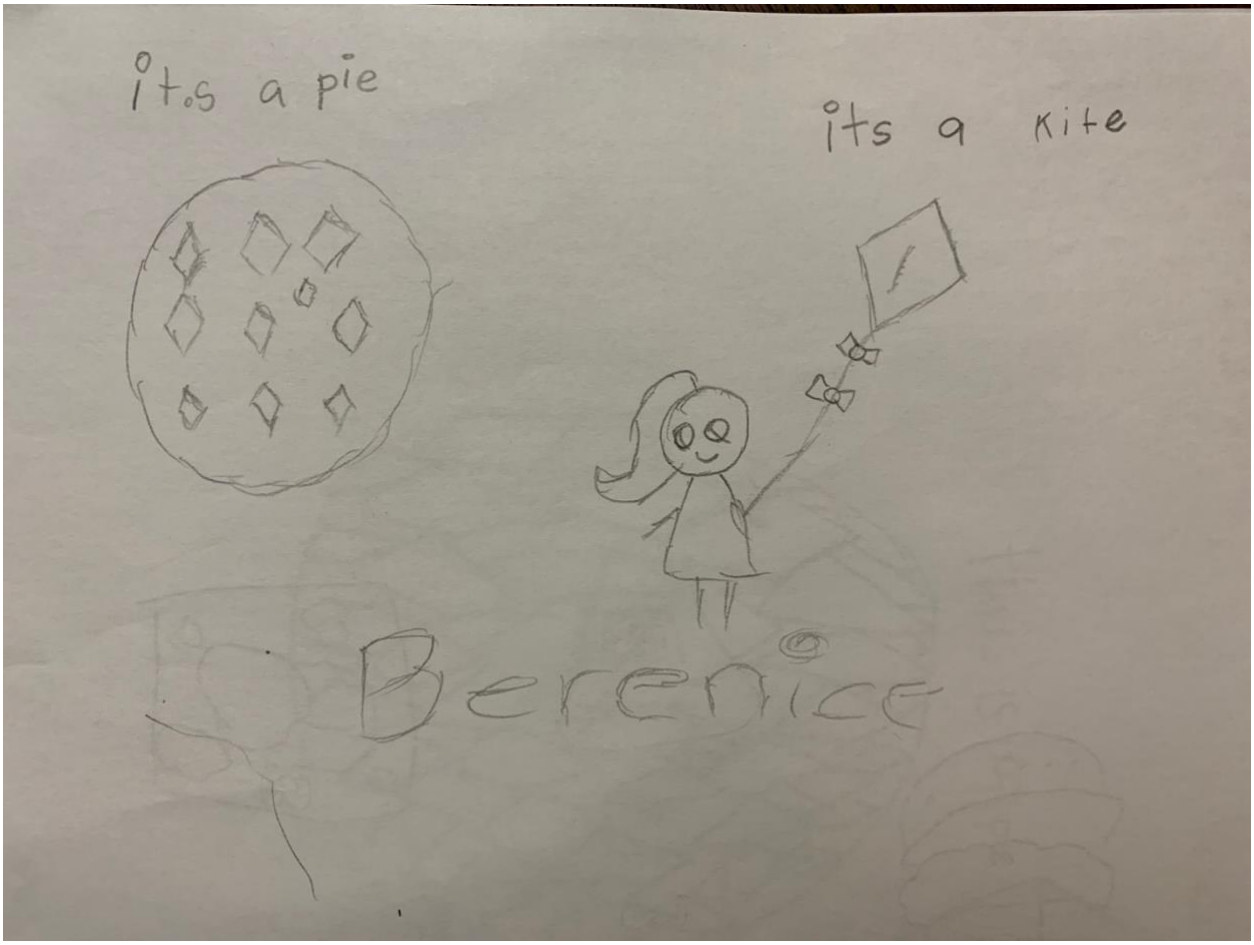


Figure 5

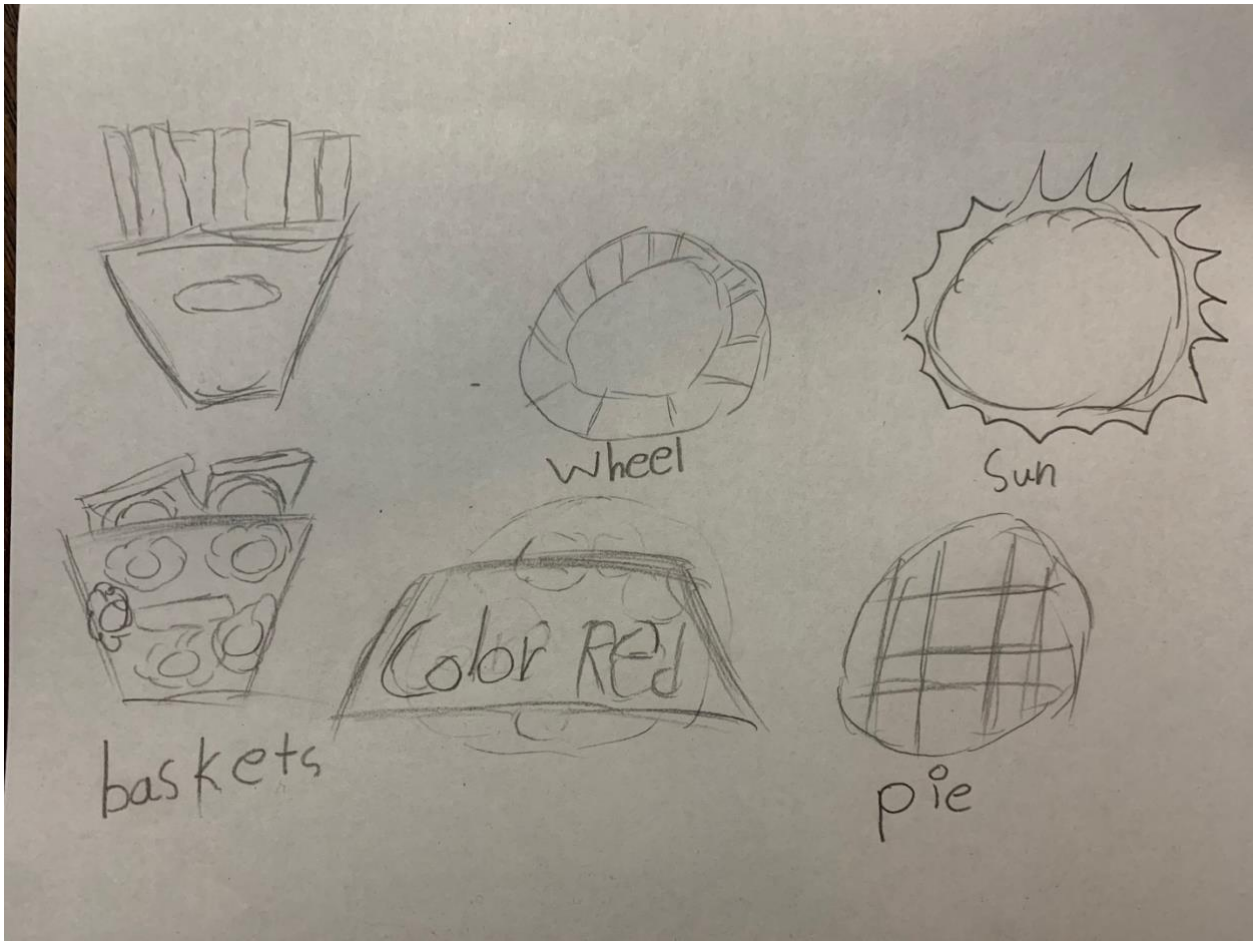
Examples of student's drawings who met, partially met, and did not meet the learning outcome.

Met Picture



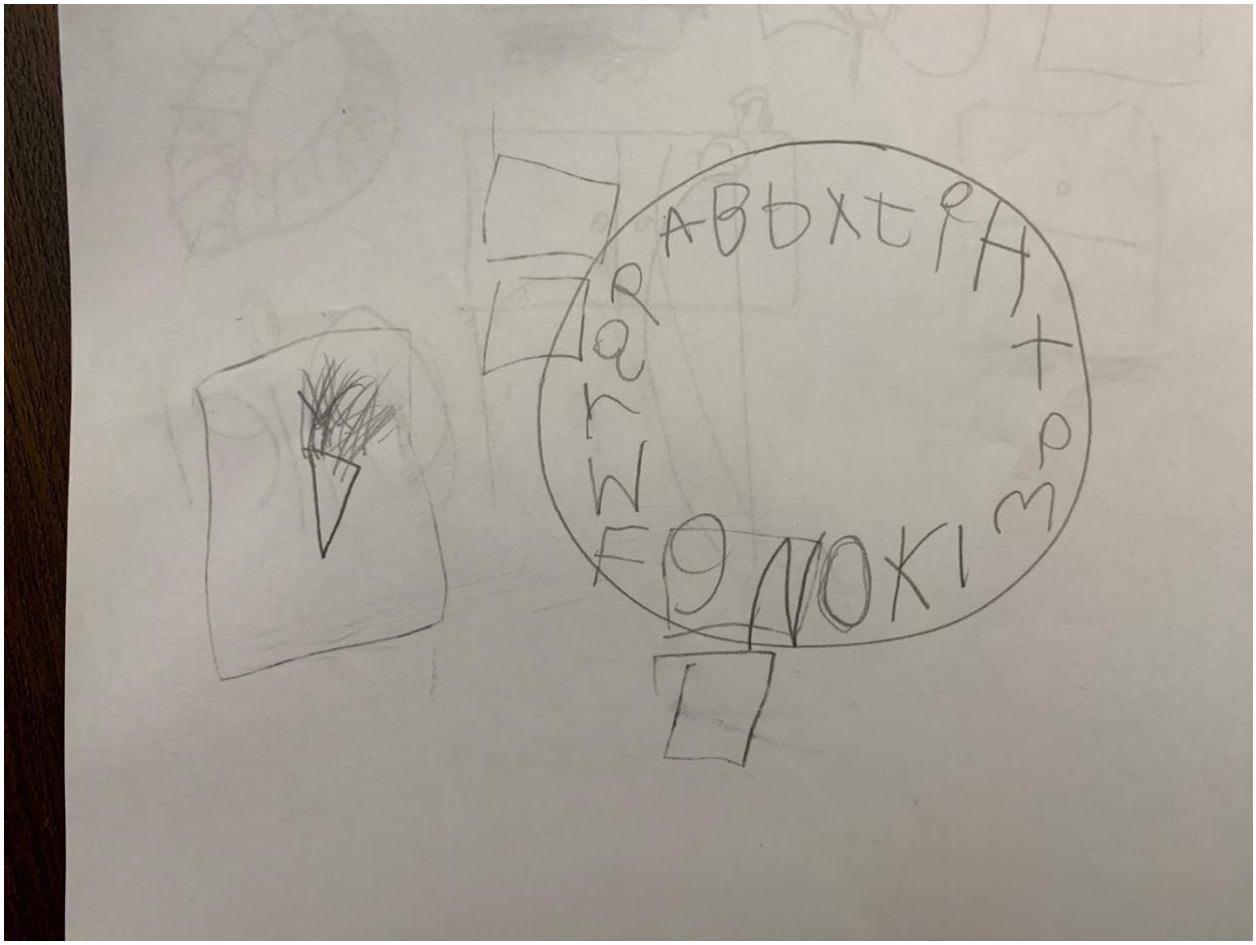
Cont. Examples of student's drawings who met, partially met, and did not meet the learning outcome

Met



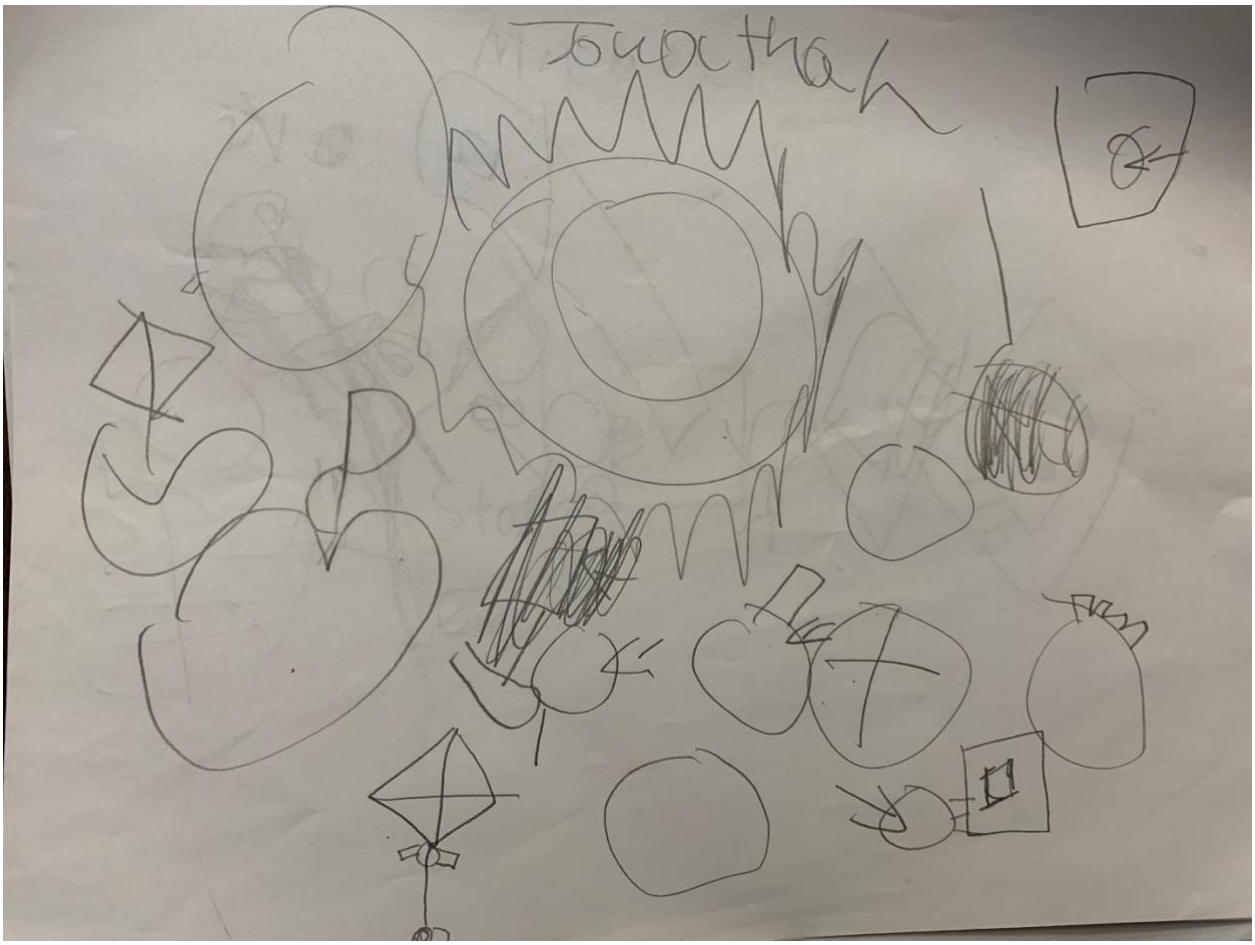
Cont. Examples of student's drawings who met, partially met, and did not meet the learning outcome

Met



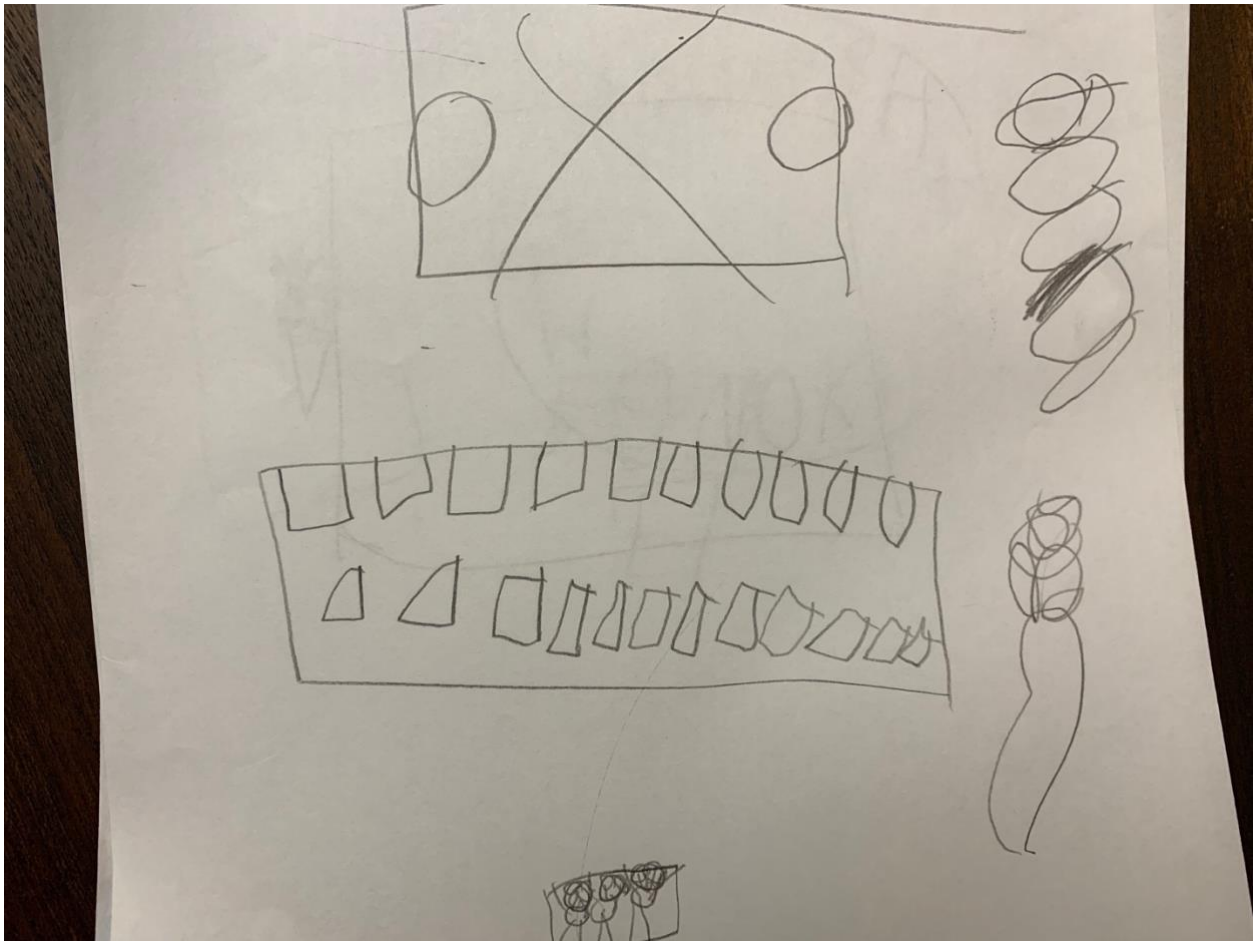
Cont. Examples of student's drawings who met, partially met, and did not meet the learning outcome

Partially Met



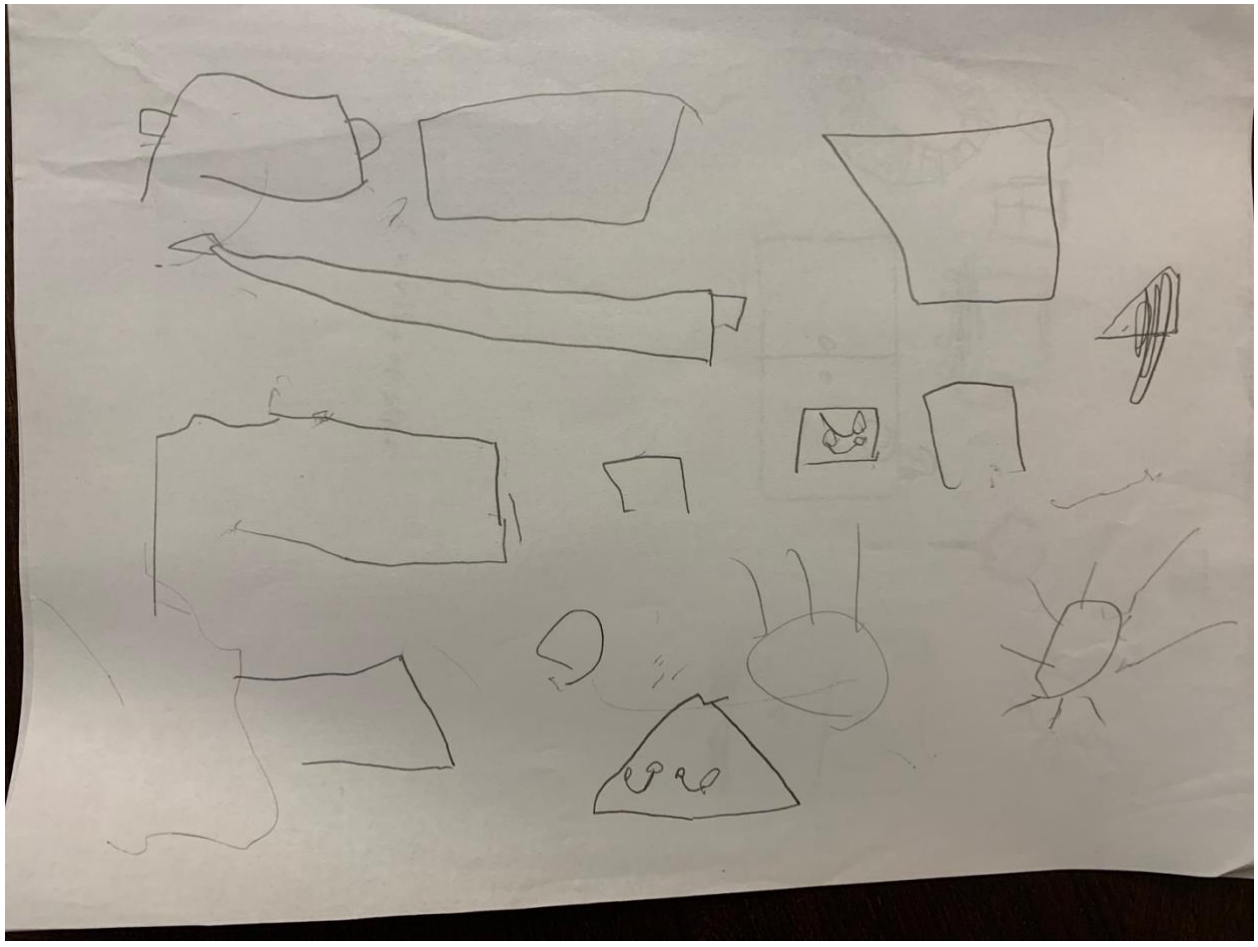
Cont. Examples of student's drawings who met, partially met, and did not meet the learning outcome

Partially Met



Cont. Examples of student's drawings who met, partially met, and did not meet the learning outcome

Not Met



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Need

Art integration is an approach to teaching in which students construct and demonstrate understanding through an art form.

Teachers are not being trained on how to implement art into their curriculum

Art integration could benefit students who have a difficult time learning

Promotes a more enjoyable approach of learning.

Gardner's Theory of Multiple Intelligences

1. Linguistic Intelligence
2. Logical-Mathematical Intelligence
3. Visual-Spatial Intelligence
4. Bodily-Kinesthetic Intelligence
5. Musical Intelligence
6. Interpersonal Intelligence
7. Intrapersonal Intelligence
8. Naturalistic Intelligence

Project

Martin Luther King Elementary School in Seaside, California

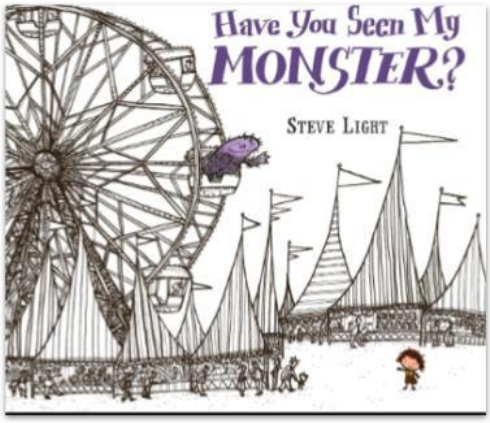
1st grade classroom of 25 students

Learning Outcomes

By the end of the project, participants will:

1. be able to identify a variety of shapes.
2. able to use shapes representationally as other objects.
3. demonstrate how to draw an object while highlighting a shape.

Methods



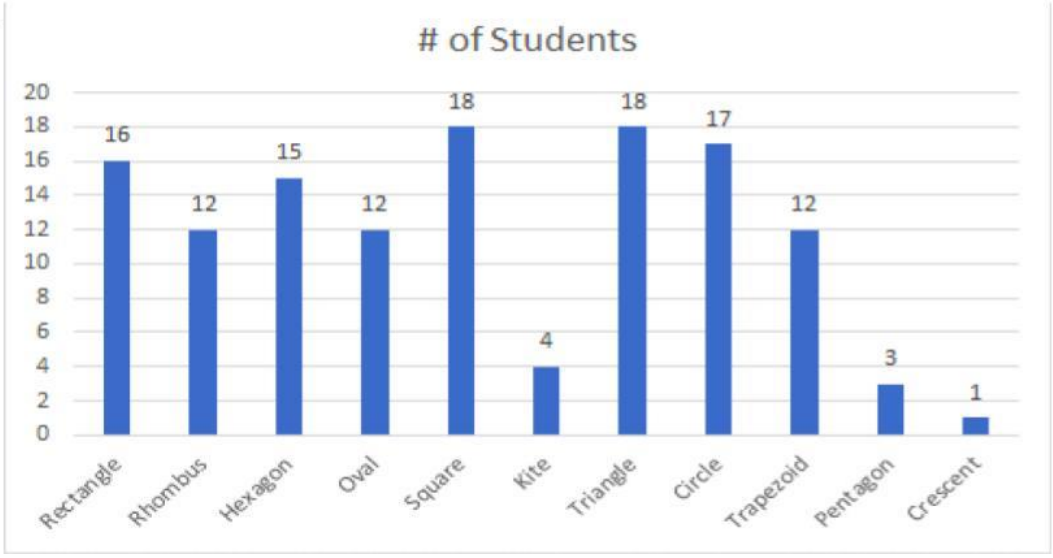
First Day:

LO #1 Participants will be able to identify a variety of shapes

5 small groups: 15 minutes each

Read Have You Seen My Monster by Steve Light

LO #1 Partially Met



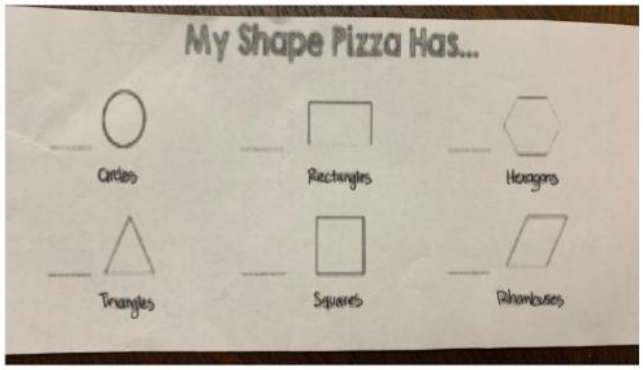
Methods cont.

Day 1:

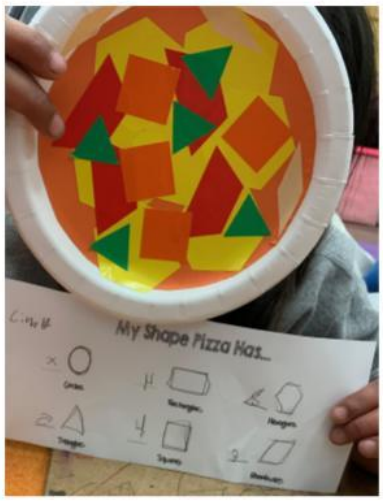
LO #2 Participants will be able to use shapes representationally as other objects.

3 small groups: 20 minutes each

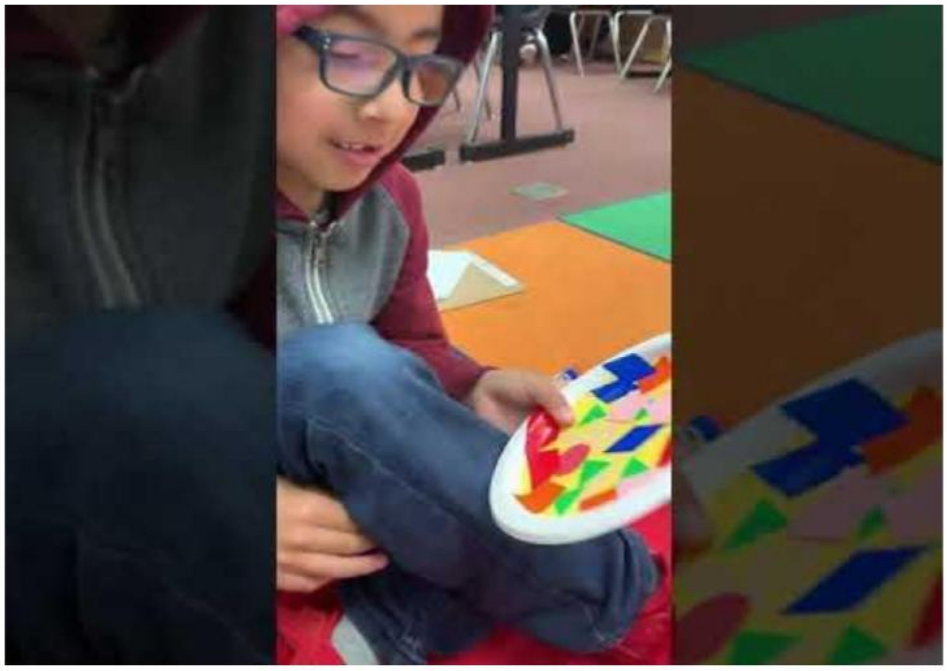
Shape Pizzas


My Shape Pizza Has...
Circles
Rectangles
Hexagons
Triangles
Squares
Rhombuses

LO #2 Met



Shapes	Objects Represented
Circle	Pepperoni, Sausage, Strawberries
Square	Onions (cebollas), Pepperoni, Oranges, Bell Peppers
Triangle	Onions, Apple Candies
Trapezoid	Sour Strawberries, Chiles
Hexagon	Cheese, Apples
Rhombus	Peaches, Blueberries, Pineapples

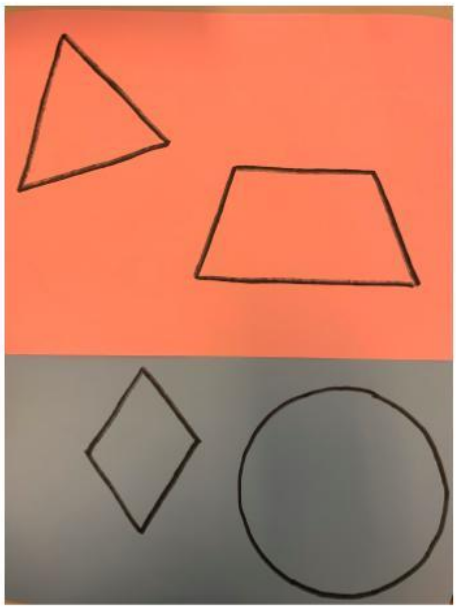


Methods Cont.

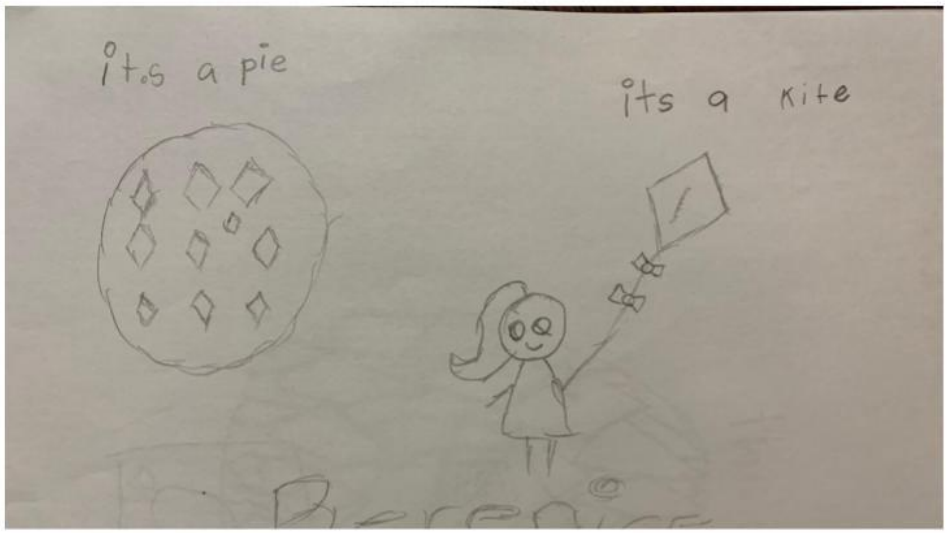
Day 2: Math Centers

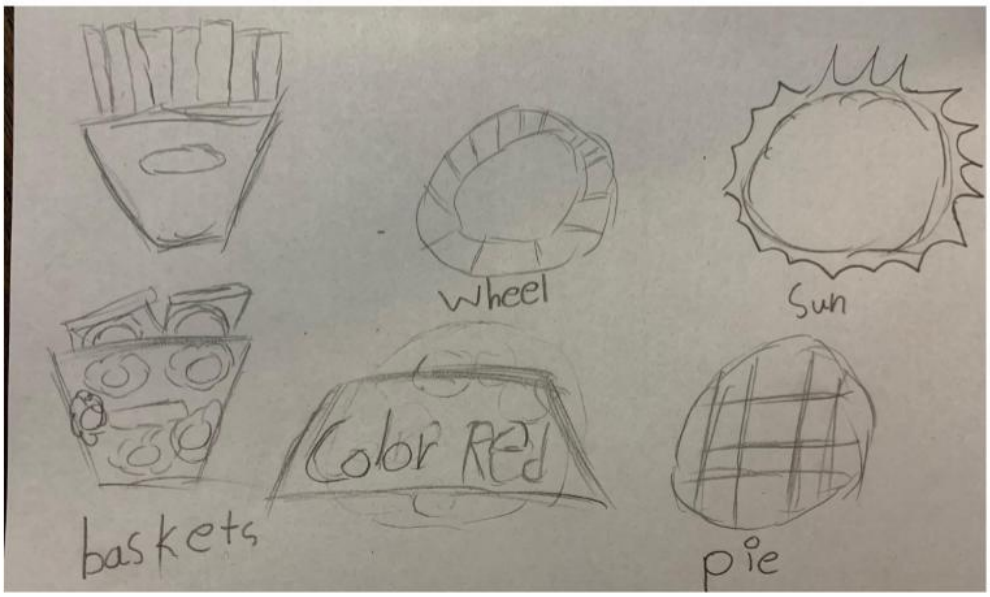
LO #3 Participants will demonstrate how to draw an object while highlighting a shape.

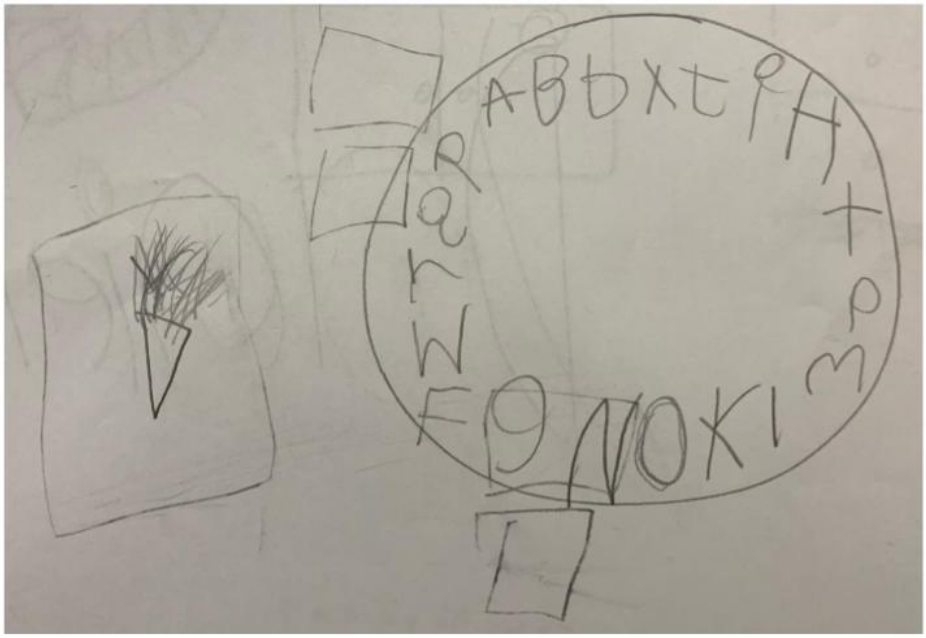
3 small groups: 20 minutes each

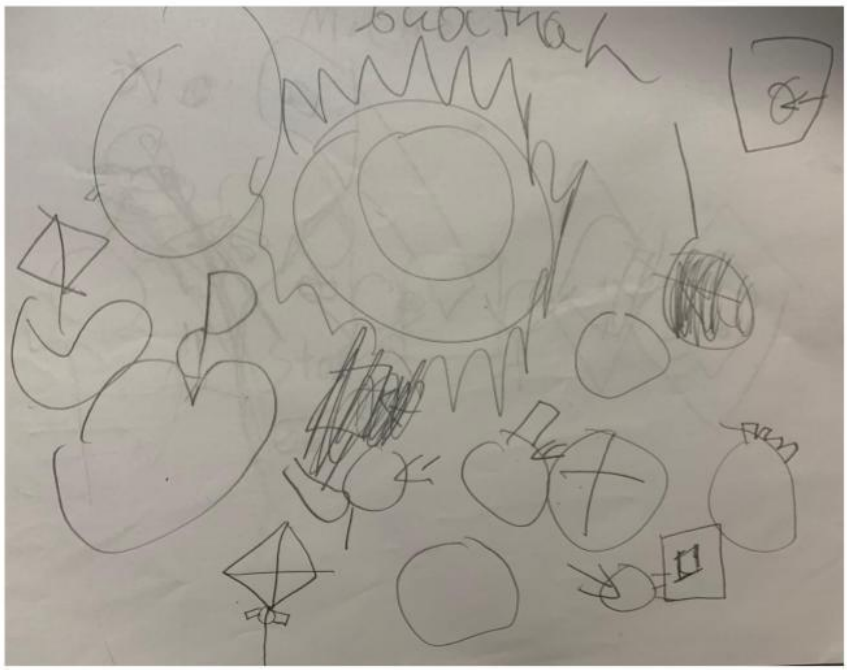


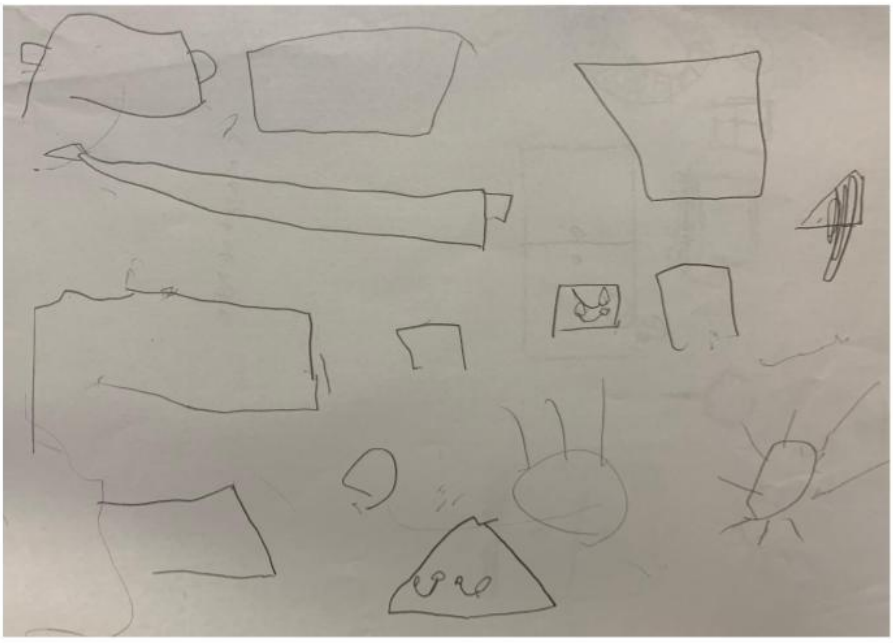
LO #3 Partially Met

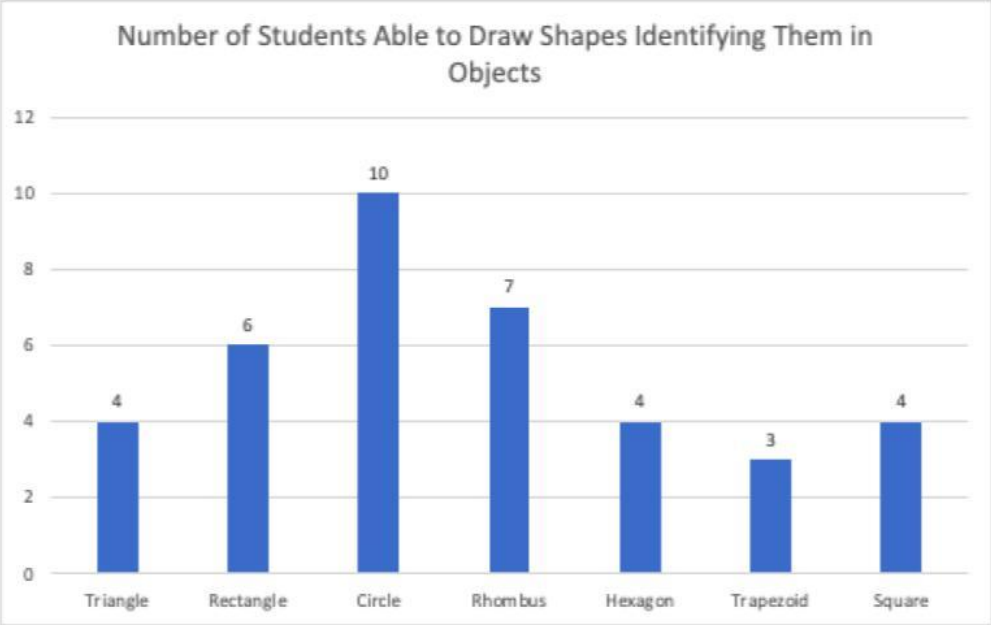



Wheel
Sun
Color Red
baskets
pie








Number of Students Able to Draw Shapes Identifying Them in Objects
12
10
8
6
4
2
0
4
6
10
7
4
3
4
Triangle
Rectangle
Circle
Rhombus
Hexagon
Trapezoid
Square

Discussion

Project was successful

With more time students could be more creative

Working on table to keep things more organized

Focus project on students who have trouble learning

Thank You! Questions?
Jessica Jeronimo
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