

**5 Day Cycle of Learning – Kindergarten**  
**Identifying and Sorting 3-Dimensional Shapes****Judges Prior Learning****Description of the School**

College Gardens Elementary School is located in Rockville, Maryland, a suburb of Washington, D.C., and contains approximately 815 students. College Gardens is an International Baccalaureate program and offers a Chinese Immersion program. It has an Autism program in which students in that program sometimes plug into the general education classrooms. The student population consists of 40% White, 23% Asian, with the remaining population coming from diverse backgrounds. Approximately 12% of the students are entitled to Free and Reduced Meals. This series of lessons took place with Mrs. Wendolyn Barrett's Kindergarten class.

**Prior Learning Experiences**

Students have just begun this unit about shapes. They have reviewed 2-Dimensional shapes including rectangles, squares, circles, triangles, and hexagons by describing these shape's attributes, composing these shapes, and going on a shape hunt through the school. The students are familiar with activities involving Venn Diagrams and charts, which will both be used in these lessons. 3-Dimensional shapes are available in the classroom and the students have used them to build, however they have not yet discussed the definition of 3-Dimensional or the names of the 3-Dimensional shapes in the classroom.

**Pre-Assessment**

For the pre-assessment, students were asked to sort a variety of shapes into the categories of 2-Dimensional and 3-Dimensional. The students were also asked to identify each shape they sorted.

**Green: Demonstrated proficiency in each task**

**Blue: Demonstrated proficiency of at least 89% in combined scores, including ability to sort the shapes correctly**

**Purple: Demonstrated a need for improvement in order to achieve mastery of objectives**

Student's Name	Sorted Shapes Correctly into 2-D and 3-D	Identified 2-D shapes (squares, circles, triangles, rectangles, hexagons)	Identify 3-D shapes (cubes, cones, cylinders, and spheres)	Comments	Total Performance
John	N	5/5	1/4	Could not identify cone, cylinder, or sphere	6/9 = 67%
Taylor	N	5/5	0/4		5/9 = 56%

Liam	N	4/5	0/4	Could not identify hexagon	4/9 = 45%
Jack	Y	5/5	0/4		5/9 = 56%
Chloe	Y	5/5	4/4		9/9 = 100%
Sophia	N	5/5	1/4	Could not identify cone, cylinder, or sphere	
Kaj	N	3/5	3/4	Could not identify cylinder, circle (he said sphere), or hexagon	6/9 = 67%
Collin	Y	4/5	2/4	Could not identify sphere, cylinder, or hexagon	6/9 = 67%
Sam	N	5/5	0/4		5/9 = 56%
Camryn	N	5/5	0/4		5/9 = 56%
Ioannis	N	4/5	0/4	Could not identify hexagon	4/9 = 45%
Si'ai	N	5/5	0/4	She sorted the shapes by attributes	5/9 = 56%
Nathan	N	5/5	1/4	Knew cone among the 3-D shapes	6/9 = 67%
Jude	N	5/5	0/4	Called the sphere a "not-flat" circle	5/9 = 56%
Justin	N	4/5	1/4	Sorted by color; knew cube; could not identify hexagon	5/9 = 56%
Riya	Y	4/5	0/4	Could not identify hexagon	4/9 = 45%
Jerry	N	5/5	0/4		5/9 = 56%
Henry	Y	5/5	3/4	Could not identify cylinder	8/9 = 89%
Vivian	Y	5/5	3/4	Could not identify cone	8/9 = 89%

<b>Bronwyn</b>	<b>Y</b>	<b>5/5</b>	<b>4/4</b>		<b>9/9 = 100%</b>
<b>Makayla</b>	<b>Y</b>	<b>4/5</b>	<b>0/4</b>	<b>Could not identify hexagon</b>	<b>4/9 = 45%</b>
<b>Brooks</b>	<b>Y</b>	<b>5/5</b>	<b>1/4</b>	<b>Could identify cube</b>	<b>6/9 = 67%</b>
<b>Sri</b>	<b>Y</b>	<b>5/5</b>	<b>3/4</b>	<b>Could not identify cylinder</b>	<b>8/9 = 89%</b>
<b>Asher</b>	<b>Y</b>	<b>5/5</b>	<b>4/4</b>		<b>9/9 = 100%</b>

\*One of my students, Liam, was absent for this Cycle of Learning. I made considerations for him in the responsiveness for all children and in each lesson; however data is not available for his performance on the learning tasks present in these lessons.

### **Planning and Teaching**

#### **Participants and Grouping:**

- All of the 24 students in Mrs. Barrett's kindergarten class will participate in the following lessons. Students will sometimes be grouped during lessons based on their pre-assessment scores.
- One of the students in this class, Sam, has an IEP for processing information. He requires repetition of directions, directions presented in multiple ways, and minimization of distraction.
- There are 3 ESOL students in this class – Jerry, Ioannis, and Justin. Jerry and Ioannis speak and understand limited English and thus need small group instruction and directions presented in multiple ways, often with pictures for guidance.

#### **Curriculum Objectives:**

#### **Maryland Common Core State Standards:**

#### **Domain: Geography**

**Cluster: Identify and describe shapes (squares, circles, triangles, rectangles, hexagons, cubes, cones, cylinders, and spheres)**

#### **Standard: K.G.2**

Correctly name shapes regardless of their orientations or overall size.

#### **Standard: K.G.3**

Identify shapes as two-dimensional (lying in a plane, "flat") or three-dimensional ("solid").

#### **Essential Skills and Knowledge**

Ability to sort a variety of shapes into two- and three-dimensional categories and explain why their sorting is correct

#### **Overall Learning/Behavioral Objective**

Students will be able to sort shapes into the categories of 2-Dimensional and 3-Dimensional. Students will be able to identify the following shapes: squares, circles, triangles, rectangles, hexagons, cubes, cones, cylinders, and spheres.

## **Responsiveness for All Children**

### **I. Provide Multiple Means of Representation**

- Customized the display of information by using a Venn Diagram to illustrate students' observations about 2-Dimensional and 3-Dimensional shapes (Day 1), recording the students' observations about whether a shape rolled, slid, or stacked on a large chart (Day 2)
- Offered alternatives for auditory and visual information by showing students the 3-D shape song. This song/video reached auditory, visual, and musical intelligences by relaying information via song and by providing pictures to go along with the lyrics in the video (Day 2)
- Offered alternatives for visual information through modeling with real-life objects (Day 2)
- Promoted understanding of the vocabulary of "2-Dimensional" and "3-Dimensional" across multiple languages by using a common object (a balloon) to present the vocabulary and its meaning to my English Language Learners (Day 2)
- Supported the acquisition of vocabulary by using repetition of the shapes' names and having the students say the names in conjunction with a visual object (each shape) (every day)
- Offered alternatives for visual and auditory information and illustrated concepts using multi-media by showing students a Brain Pop Jr. video that discussed 3-Dimensional shapes and their attributes (Day 3)
- Activated background knowledge and allowed students to make connections between 3-Dimensional shape names and attributes by showing students real-life objects and having them identify which 3-Dimensional shapes they were (i.e. a tissue box, a Pringles can) (multiple days)

### **II. Provide Multiple Means of Action and Expression**

- Provided options for physical action by allowing students to move around the classroom and to physically find and sort objects (Day 1)
- Sorted 2-Dimensional and 3-Dimensional shapes onto chairs as a whole group, reaching the visual and kinesthetic intelligences in my class (Day 1)
- Facilitated the management of small groups by assigning students who scored highly on the pre-assessment to different groups and made them recorders, allowing them to also be effectively engaged in the lesson while helping their groups to both stay on task and to make connections with content (Day 2)
- Involved students with focused and higher order questioning to engage and to encourage multiple means of expression via conversations and answers to my questions (Multiple Days)
- Varied methods of responses by asking students to perform a variety of tasks, including sorting, completing charts, and exploring (Multiple Days)

- Optimized the use of technology to sort shapes and to accomplish the objective of identifying and matching shapes with real-life objects using a Kidspiration sort on the Promethean board (Day 3)
- Differentiated instruction by varying the means of response, the difficulty of the tasks performed, and the level of support provided for small groups of students (Multiple Days)
- Provided options for physical action and navigation through a 3-D shape hunt through the hallways of the school (Day 5)

### **III. Provide Multiple Means for Engagement**

- Fostered collaboration and community by encouraging conversation and group work. Allowing students to collaborate also reaches my interpersonal learners by allowing them to learn via communication and cooperation (Multiple Days)
- Minimized threat and distraction for students I know have difficulty focusing and for my student who has an IEP for processing information. I pulled these students to work with me in a small group atmosphere to ensure they were able to focus and stay on task (Multiple Days)
- Optimized relevance and authenticity of the content of the lessons by associating the 3-Dimensional shapes I was teaching with real-life objects (Multiple Days)
- Optimized motivation by using equity sticks to call on students, with the effort of keeping all students actively engaged (Day 4)
- Varied demands and resources for students to optimize challenged, such as differentiating independent practice and tasks performed by students (Multiple Days)

## **Day One**

### **Materials**

- Variety of 2-Dimensional and 3-Dimensional shapes (i.e. attribute blocks, pattern blocks, cereal boxes, paper cut-outs of shapes, cans, etcetera;) – at least 24 of both 2-D and 3-D shapes/objects
- Whiteboard and dry erase marker
- 3-D shape song - <http://www.youtube.com/watch?v=nnJVF2aEIC8>

**Learning Objective:** Students will be able to sort and identify objects as 3-Dimensional or 2-Dimensional based on the attributes they see and feel.

**Introduction:** I will say to students, “Last week we started reviewing 2-Dimensional shapes and the attributes of 2-Dimensional shapes. Today I want to explore another set of shapes that is different from the ones we have recently been exploring and discussing about.”

**Direct Instruction:** I will ask students to go around the classroom and find two different objects. One that they consider “2-Dimensional” and one that they consider “3-Dimensional”. I will model finding the shapes.

*Think Aloud:* “Let’s see. I want to find a shape that is 2-Dimensional. What does 2-Dimensional mean? I am not entirely sure, but I know that Ms. Trueblood was referring to shapes like the circle and triangle when she talks about 2-Dimensional shapes. So maybe if I find something that is a circle or a triangle, I will have found a 2-Dimensional shape (pick up a coin) Here is something that is a circle! Okay, now what does 3-Dimensional mean? Well, it must be somehow different from 2-Dimensional shapes. Let me see if I can find something that looks different from the shapes we have been recently talking about (pick up a cone). Okay, this looks different!” I will model coming back to the carpet and sitting down with an object in each hand.

**Guided Practice:** Students will go around the classroom and find two objects – one they think is two dimensional and one they think is 3-Dimensional. I will have shapes set out as well as everyday objects that they will be able to find. Once students have acquired two objects, they will come back to the carpet with them.

Once students are back at the carpet, I will ask, “Do you think we can work together to sort these objects? Let’s put the objects you think are 2-D on this chair and the objects you think are 3-D on this chair (point to two different chairs).”

- After the students sort, I will ask them, “Are there any objects that anyone thinks should be moved?” if a shape has been placed in the incorrect category.
  - I will ask students to turn to their carpet buddy and discuss what they notice is similar about the 2-D and 3-D objects and what is different.
  - After students have discussed for a minute, I will record their observations on a Venn Diagram labeled “2-Dimensional” and “3-Dimensional”
- After we complete the Venn Diagram, I will ask if anyone thinks they can provide a definition for 2-Dimensional and 3-Dimensional. I will clarify that 2-Dimensional means that an object or shape is flat, and I will show the students a piece of paper. I will say that 3-Dimensional means that an object or shape is solid, and I will show them a cereal box, a can of Pringles, and a cube. I will also ask the students, “How many of you saw the Lego movie? How many saw it in 3-D? Did you notice how the characters seemed solid, like they were right in front of you? That is the way 3-D works. If the movie wasn’t in 3-D, then the characters would have been flat.”

**Independent Practice:** I will now ask students to again search the room for one 2-D shape and one 3-D shape. When they come back to the carpet with their objects, I will ask the students to hold up the 2-D shape they found, and then to hold up the 3-D shape they found.

**Closure:** I will ask students to restate what the terms “2-Dimensional” and “3-Dimensional” mean and how we can sort shapes into different categories. I will have students listen to the 3-D shape song to reinforce the shapes they explored today.

**Assessment:** I will do a check-in as students hold up their shapes during independent

practice to determine who understands the terms introduced in this lesson.

**Analysis:** All of the students except for Jude, Jerry, Ioannis, Liam, and Justin were able to identify a shape as 2-dimensional or 3-dimensional. These five students held up a 2-dimensional shape when I asked for a 3-dimensional shape, or vice versa. These students will need more instruction on the meaning of 2-D and 3-D.

**Reflection:**

Today I learned the value of letting children explore and discover. I did not provide the students with a definition of 2-Dimensional and 3-Dimensional at the beginning of the lesson. Instead, by letting them try to discover what it means, they seemed to make deeper connections with the vocabulary and with the concept. As I was explaining at the end of the lesson what 2-dimensional and 3-dimensional means, several students offered their ideas and referenced the activity we had just performed. They were easily able to define 2-D as being “flat” and 3-D as being, in their words, “sticking out.”

I also noticed in this lesson how making connections with what students care about allows them to make deeper connections with information. By bringing up the Lego movie, which is very popular among my students, the students became very excited. I asked my students to compare the 3-D Lego movie with other movies they have seen (and in this instance, the movie Frozen, which is also very popular, entered the conversation). They were able to uncover on their own that 3-Dimensional and 2-Dimensional items have different qualities. The excitement they demonstrated today as they tried to decode new vocabulary and as they performed the activities was very encouraging.

## **Day Two**

### **Materials**

- Cone, cylinder, sphere, and cube blocks (One of each for each group, found in basket on Math manipulatives shelf)
- 6 charts with shapes and questions
- 6 pencils
- Rectangular prism for model
- Chart paper/marker

### **For small group lesson:**

- Balloon
- 2-D pattern blocks and 3-D blocks (found on Math manipulatives shelf)
- Labels of 2-D and 3-D on index cards to be placed on table

**Learning Objective:** Students will be able to identify whether cones, cubes, spheres, and cylinders can roll, slide, or stack. Students will be able to discuss why they think these shapes can or cannot perform these tasks.

## Procedures

**Introduction:** I will begin this lesson by saying, “Today we will be exploring a variety of shapes to discover what makes one shape different from another.” I will have the students sit on the carpet as I show them the shapes they will be exploring.

**Direct Instruction:** I will say to the students, “Does anyone remember the definitions we came up with yesterday for 2-Dimensional shapes and 3-Dimensional shapes? (2-D shapes are flat, 3-D shapes are solid and “stick out”)

- I will go through the 3-Dimensional shapes of cone, cylinder, cube, and sphere. For these shapes, I will hold up the shape and ask the students if they have seen any everyday objects that look like those shapes. I will specifically ask Bronwyn, Asher, and Chloe, who knew all of the 3-D shapes on the pre-assessment, to think of objects they have seen that look like cones, cylinders, cubes, and spheres. After determining what each shape is called, I will ask the students to repeat the name of the shape three times.
- I will tell the students, “Today we are going to explore three questions about different 3-D shapes. Do they roll? Do they slide? Can you stack them? By exploring these questions we will be able to become more familiar with the qualities and characteristics of these shapes, which will ultimately help us to identify them.”

*Think Aloud:* “You will be given 3-Dimensional shapes. Your job will be to find out if these shapes can roll, if they can slide, and if you can stack them. You will also try to discover the reasons why it can or cannot complete these tasks. Let me demonstrate with this shape (a cube). I want to think about the question first. Do I think this shape will roll? Well, I see it has some edges, and there are some flat surfaces. But from what I know about rolling, it is usually an object that has curves, like a ball, that rolls the smoothest. Let me see (roll the cube). Well, though it moved, it was not a roll. It kind of tumbled and bounced across the floor. I think that may be because of the edges on the shape.

Now I need to test if this shape will slide. I think that because it is flat, it will slide. I’ve seen things like plates slide across a table because they are flat. Flat surfaces slide very easily. Let me see (slide the prism across the table). It did slide! I was correct!

Finally, I need to see if I can stack this object. Since it stands on its own easily, I think it will probably stack easily, too. Let me see (stack another block on top of the cube, and then switch it so the cube is on top of the other block). It stacks too!”

- For each model I perform, I will record my result with an X or a check on a piece of paper under each question. Students will receive a similar paper with the names and pictures of each shape they will test.



**Guided Practice:** Students will be sent back to their tables. I will make Bronwyn, Chloe, and Asher recorders, as well as Henry and Vivian, who both only missed one shape on the pre-assessment. These students are also leaders in the classroom, and will help their tablemates to focus and to discover the necessary information. Once students are at their tables, I will say, “Let’s do the sphere together. Find the sphere on your paper.” I will also ask one student from each table to hold up the sphere, as the shapes will already be on the students’ tables. I will ask the students each time if they think the sphere will roll, slide, or stack and why they think so. We will all record the results as we perform the tests together.

**Independent Practice:**

- Now I will place shapes on each table. The students will be given 10-15 minutes to explore and record their findings.
- Small Group Instruction:
  - I will ask Liam, Sam, Justin, Ioannis, and Jerry to come work with me. These students generally have difficulty staying on task, therefore proximity and access to the teacher will help them to focus. Justin, Ioannis, and Jerry are all students who are English Language Learners, therefore I will be available to support them with vocabulary when needed and to reinforce the connections I want them to make between the shapes’, the shapes’ names, and the shapes’ attributes. I will give them a shape and have them work together to roll it, slide it, and stack it and to record their results.

**Closure:** After this lesson, I will have the students share their findings and I will record them on a large chart. I will say at the end, “Today we explored whether a 3-D shape can roll, slide, or stack because doing so will help us to become more familiar with how these shapes are solid, and what possible functions of these shapes can be. We will also be able to identify a 3-D shape regardless of what position it is in based on our explorations today.”

\*During center-time today, I will also call Jude, Jerry, Ioannis, Liam and Justin to sort 2-D and 3-D shapes. These students were unable to do so in yesterday’s lesson. I will provide these students with 2-D and 3-D shapes.

- Direct Instruction – I will ask the students to define 2-D and 3-D. If they are unable to come up with an answer I will tell them that a 2-D shape is flat and that a 3-D shape is solid. I will show the students a flat balloon and say it is 2-D because it is flat. I will then blow the balloon up. “Now it is a 3-D balloon!” After this demonstration, I will say, “Let’s see if we can sort shapes into 3-D and 2-D now.”
- *Think Aloud:* “I have several shapes here. If 2-D means flat, then I have to find a flat shape and place it under the “2-Dimensional” label. (Pick up a circle and place it under the 2-D label). Now, if 3-Dimensional means solid and sticking out, then I need to find a fuller shape to place under the 3-D label (pick up a cube and place it under the label on the table).
- Guided Practice: I will show the students two shapes and ask them where we should place them. I will show the students a rectangle and a cone. “Which object do you

think goes in the 2-D pile? Why do you think so? Which object should go in the 3-D pile? Why?”

- Independent Practice: Students will sort the rest of the shapes on their own, physically placing the blocks under the correct label on the table.
- Closure: I will mix up the shapes and have the students grab one 2-D shape and one 3-D shape. I will ask them to hold up their 2-D shape, and then to hold up their 3-D shape. I will then ask them to define the term “2-Dimensional” and the term “3-Dimensional”.

**Assessment:** During the whole group lesson, since I only had one person from each table record the findings, I am only assessing if the group was able to come to a consensus about the correct answer for each exploration (does the shape roll, slide, and/or stack?)

Table Group	Number Correct on Chart	Comments	Percentage
Red Group – Sophia, Kaj, Vivian	9/12	These students struggled with determining the abilities of the cone	75%
Green Table – Sri, Henry, Riya, Bronwyn	12/12	These students collaborated well together at their tables. I overheard every student contributing to the exploration.	100%
Purple Table – Chloe, Collin, Jack, John	5/12	These students struggled with staying on task. They were only able to complete half the chart in the time allotted.	41%
Orange Table – Jude, Camryn, Si'ai	6/12	These students struggled with this task. They also did not complete the chart in the time allotted.	50%
Blue Table – Brooks, Makayla, Asher, Taylor	12/12		100%
Small group who worked with me – Justin, Ioannis, Jerry (Liam absent)	9/12	These students were able to test the shapes though I had to keep walking around the room and was unable to give	75%

		them the attention I had planned for. I sometimes would intervene, but they were able to explore for themselves and to determine the qualities of the shapes on their own.	
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After the small group instruction with Jude, Jerry, Ioannis, and Justin, all of the students except Jerry were able to correctly hold up a 2-D and 3-D shape when asked.

### Analysis:

- 2 out of these 5 groups mastered this lesson. The other groups were unable to display mastery of the lesson.
- I am not concerned that the majority of the groups were unable to master this lesson. The purpose was to become more familiar with these shapes and to observe them in different formations/orientations. Therefore I do not plan on re-teaching this lesson because even the students who did not display mastery received practice in manipulating, handling, and identifying the various 3-Dimensional shapes.
- Jerry still needs to instruction on the difference between 2-Dimensional and 3-Dimensional shapes.

### Reflection:

As I was teaching this lesson, it did not feel successful. I could tell as the students worked that some groups of students understood the content and purpose of this lesson, but others did not. It was interesting to see how completely a table of students did or did not understand about the abilities of the shapes, and how to determine whether the shape rolled, slid, or stacked.

I fear from this lesson that my objective got lost. My purpose was to allow the students to develop more familiarity with the shapes and to build on their prior knowledge of these shapes. I felt that manipulating and exploring the shapes would allow them to make greater connections. However, I do not feel the majority of the students made strong connections with the shapes, the shapes' names, and the shapes' characteristics. What could have helped with this is if I had implemented the guided practice I had planned here. Instead, when implementing this lesson, I thought my students understood. Therefore instead of testing all of the capabilities of the sphere, I only tested whether or not it would roll with my students. Then, I had them try independently. However, if I had enforced my plan for guided practice, I believe my students would have been more able to perform the tasks independently.

One of the most challenging aspects of this lesson is that some tables were adamant that a sphere could stack. I tried to scaffold them to say it did not, but they were determined to prove

me wrong. They manipulated the sphere to stack on top of the cylinder and the cube. I asked if it was sturdy, and they replied no, but it still stacked. I then had to modify this lesson. I stopped everyone and had them come to the carpet to read the story “Space Race” by Bob Barner. The story is about two robots who stack a variety of shapes to build rocket ships. One robot uses shapes that create a better, sturdier rocket ship than the others. After reading this story, I asked the students which rocket ship was a better rocket ship and why. Then I asked them if a sphere would make a good base for a rocket ship and they replied that it would not. Therefore, I was able to modify the lesson to help students reach an understanding, however it took alterations to my original plan to be able to do so.

## **Day Three**

### **Materials:**

- 3-D shape blocks (cube, cone, cylinder, sphere, rectangular prism, pyramid)
- 18 papers with shapes and spaces for the number of attributes, 6 papers with challenge on the back
- One large chart paper with 3-D shapes listed along with the categories of “Number of Faces”, “Number of Edges”, and “Number of Angles”
- Brain Pop Jr. video: <http://www.brainpopjr.com/math/geometry/solidshapes/>
- Magnetic blocks and hexagon charts/hexagon pattern blocks (for students to explore when they finish the activity)

**Learning Objective:** Students will be able to identify the attributes of 3-D shapes – edges, faces, and vertices. Students will be able to count the number of edges, faces, and vertices that are present on a cube, cone, cylinder, and sphere.

### **Procedures:**

**Introduction:** I will ask students, “Who can tell me what we did yesterday as we explored 3-D shapes? Today we are going to explore 3-D shapes more so we can better understand them and identify them.”

**Direct Instruction:** I will show the students each shape we explored the day before – a cone, a cube, a cylinder, and a sphere. As I show the students each shape, I will have them say the name of the shape three times.

- “3-D shapes have certain attributes, or characteristics. One of these attributes is a face. Can anyone make a prediction of what they think a face may be on this cube? A face is a flat surface on a 3-D shape. (I will write the definitions of the attributes on the board as I go through them). Do you notice anything about the faces on these shapes? (Talk about how the faces look like 2-D shapes – squares, triangles, etcetera) What about an edge? Does anyone have a prediction of what an edge is? An edge is the corner where two faces meet. Hold up your hands. Pretend they are the faces of a 3-D shape. Now bring them together. Where your two hands have met is the edge of your shape. Finally, there are angles. What do you think an angle is? An angle is where the edges of your

shape meet. Angles are sharp.” After this initial explanation, I will show the Brain Pop, Jr. video that reinforces these attributes of 3-D shapes.

*Think Aloud:* “Let’s take another look at the shape I modeled with yesterday. This shape is called a rectangular prism (use a tissue box). Everyone say rectangular prism (Allow students to practice saying it). Let me see if I can identify the faces, edges, and angles of this shape.” Record findings on a chart with all the 3-D shape names on it. “Okay, well I said a face is a flat surface. This triangular prism has several flat surfaces. Let me count them. Here is one, two, three, four, five, six (point as you count). Since there are six flat surfaces, there must be six faces! Now I need to look for the edges. Edges are where the faces meet. I see several on this shape already! Let me count them (point as you count). There are twelve edges! And what about angles? I will just have to look for the sharp pieces. Here is (point as you count) one, two, three, four, five, six, seven, eight angles!” I will record the number in the proper spaces on my chart.

**Guided Practice:** I will now show the students a pyramid. “Let’s see if we can count the faces, edges, and angles of this shape together.” I will ask the students to tap their nose when I am pointing to a face. I will point to an edge first, then an angle, then a face. I will point to the faces as the students count. I will do the same for edges and angles on the pyramid and I will record our results on the chart.

**Independent practice:** Now every table will be given shapes to explore and uncover the number of faces, edges, and vertices.

- I will again work with Liam, Sam, Justin, Ioannis, and Jerry. I will ask them to work together to find the faces, edges, and angles on the cube. I will show them each shape and have them point to the faces, edges, and angles. We will count together and then they will record our findings.
- Chloe, Asher, Bronwyn, Sri, Henry, and Vivian will be asked to work together on the carpet. They have a challenge on the back of their papers that asks them to identify which 2-D shape they would see if they were to open a cylinder, which 2-D shapes are on a cube, and if they can think of another 3-D shape that has a 2-D face.

\*Students who finish early will be able to explore with hexagon and magnetic blocks. The hexagon pattern blocks will help students who missed identifying the hexagon on the pre-assessment and the magnetic blocks can be manipulated to make 3-Dimensional shapes.

**Closure:** I will ask each group to share their findings. We will check their answers together as a whole group and record our final findings on the big chart with all the shapes listed on it.

**Assessment:** I will view students’ independent practice to determine their mastery of this lesson. I will be scoring their practice based on if they are able to write the correct number of faces, edges, and vertices that are on a cone, a cylinder, a cube, and a sphere.

Students who achieved a score of 75% or higher	Nathan, Jack, Riya, Makayla, Collin, Jude, Brooks, Chloe, Asher, Taylor, Henry
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Students who achieved a score of 50-75%	Sophia, Sam, Jerry, Justin, Ioannis, Sri, Bronwyn, Camryn, Vivian, John, Si'ai, Kaj
Students who achieved a score of 50% or less	None

### Analysis:

- All of my students achieved a score of 50% or more. I consider this a success because I did not expect my students to receive perfect scores. However, 50% indicates that the students were at least able to identify what exactly a face, an edge, and a vertice were on their 3-D shapes.
- The reason I am not concerned with the all students achieving scores of 80% or higher is because this was their very first lesson involving faces, edges and vertices. It is difficult to keep track of how many are on the 3D shapes, however, I observed students pointing to the correct attributes as they counted. This was my objective, and students being able to correctly identify how many of each attribute is on each shape was an additional benefit.
- The small group of students I worked with during their independent practice (Sam, Jerry, Justin, and Ioannis) seemed to benefit. As I showed shapes to these students, they were able to call out where a face, edge and vertice were. They still achieved lower scores on the independent practice, however they were able to gain more knowledge and familiarity with 3D shapes and attributes.
- I provided a few of my students (Sri, Asher, Bronwyn, Vivian, Henry, and Chloe) with an extension. I asked them questions about which 2D shapes they notice on certain 3D shapes. This is an upcoming objective in the 3D shapes unit and I wanted to provide these students with a preview as well as a challenge. Of these students, only Sri and Vivian received perfect scores on the challenge. Chloe and Sri were able to answer 4 out of 5 of the questions correctly, and Bronwyn and Henry each only answered 2 questions correctly.

### Reflection:

Today it was very beneficial to support a specific small group of students. Normally during whole group instruction and independent activities, Sam, Ioannis, Jerry, and Justin seem lost. For Sam, it is generally his inability to quickly process information that makes it difficult for him to perform tasks independently. For Jerry, Ioannis, and Justin, they are still not proficient in English, and this causes them to get lost when a lot of information is presented in only one way. When I worked with this small group of students however, I was able to slow down the instruction and allow them time to process and understand. I showed them the actual shapes I wanted them to count the attributes of, and I spent time teaching them the vocabulary of face, edge, and vertice by having them say the words repeatedly and point to the attributes on each shape. The pace and structure of this small group lesson seemed to reach these students, and allowed me to see how beneficial individualized instruction is in any subject.

## **Day Four**

### **Materials:**

- Promethean board with Kidspiration 3-D shape sort
- 18 copies of cut and sort of 3-D shapes
- 18 pairs of scissors and glue sticks (can be found at students' tables)

For small group instruction

Group 1:

- 3-D objects of various sizes (cubes, cones, cylinders, spheres)
- Index cards with 3-D shape names written (sphere, cube, cone, cylinder)

Group 2:

- Paper "Mystery" bags with 3-D shapes in them (one for each bag)

**Learning Objective:** Students will be able to identify shapes by their names and as being either 3-Dimensional or 2-Dimensional by completing a sorting activity.

### **Introduction:**

- I will say to students, "Who can name the 3-Dimensional shapes we have been exploring over the past few days?" After the students name the shapes, I will say, "Today we are going to practice matching these shapes with their names so we can become better at identifying them."

### **Direct Instruction:**

- I will have the 3-D shape sort on Kidspiration loaded on the promethean board.

*Think Aloud:* I will say, "Look at all of the shapes on this sort. Not all of them are simply shapes as we have seen them so far. Some of them are objects, but they are still 3-D shapes. For example, look! A paper towel roll! I never thought about a paper towel roll as being a 3-D shape, but I suppose lots of objects are 3-D shapes. After all, most objects are not flat! Well, let's see. A paper towel roll has two round faces, and one side. Let me look at the attributes chart we made the other day. Ah! It is a cylinder! I see I could also match the paper towel roll to the picture of the cylinder that is labeled at the top of the chart to guide me."

- I will provide another example to guide the students – "Let's see. Here is a ball. A ball is round, just like a circle, but it is not flat. I remember practicing saying sphere the other day, and I remember how it rolled, but did not slide or stack." I will move the ball picture under the "sphere" label.

### **Guided Practice:**

- We will complete the rest of the chart as a group. I will use equity sticks to call on different students to sort the objects on the board. I will ask the other students if they agree with the choices the students who are sorting are making. I will ask the students to make connections to the previous two lessons we have performed as well by asking, "Does anyone remember if this shape slides, rolls, or stacks? Does anyone remember what the attributes of this shape are?"

### **Independent Practice:**

- Students will be sent to their seats with a paper for them to cut, glue, and sort pictures

of objects in their correct 3-D shape categories. As students are completing this chart I will be calling small groups of students to work with. There are also 2-D shapes to sort as a review for some students and as practice for the students who missed some of the 2D shapes on the pre-assessment. All of the students will be asked to label all of the shapes to increase the connections they are making between shapes and the shapes' names.

- Chloe, Asher, Bronwyn, Henry, Vivian, and Sri will be asked to draw pictures of the shapes and to label them instead of sorting the pictures for an added challenge.
- Liam, Justin, Jerry, Ioannis, and Sam will be given papers with squares on them so they know how many of each shape should go in each category.

### **Small Group Instruction:**

Acceleration – Henry, Vivian, Sri

\*These students only missed identifying one of the 3-D shapes on the pre-assessment. To enhance their learning, I will have them sort manipulatives and real-life objects of various sizes into the shape categories. This will allow me to see if these students can identify these shapes regardless of the size or orientation of the shape. This will also allow me to work with them on the shapes they missed on the pre-assessment. (Cylinder and cone)

- Independent Practice: I will tell students that this sort is just like the one we just did together on the promethean board, only it is with real objects. I will ask them to sort the shapes under index cards that only have the shape's names on them with no pictures for guidance. As students sort, I will ask them to make connections to where they have seen these shapes and objects before in their own lives. (i.e. "Have you ever had an ice cream cone? Is an ice cream cone the same shape as this cone? Does it have the same attributes?")

Acceleration – Chloe, Bronwyn, Asher

\*These students were able to identify all of the 3-D shapes on the pre-assessment. To challenge them, I will have them practice identifying the shapes by only feeling the shapes in a mystery bag and seeing if they can match the attributes they feel with the shapes' names.

- Independent Practice: I will tell students that this sort is similar to what we were practicing on the promethean board; however, they are going to practice identifying the shapes just by feeling the attributes of the shapes. I will ask Chloe to reach her hand into the bag and to feel the shape. I will ask her what she feels: "Are there any flat surfaces? What do you think those are called? How many do you feel? Do you feel any vertices or edges? How many can you feel? Do you think you can identify the shape?" I will ask these questions to each student as they feel the shapes.

**Closure:** After all of the sorting has ceased, I will ask the students to restate what we did today. "How can you identify different 3-D shapes? Does knowing the attributes and characteristics of shapes help you to identify them?"

### **Assessment:**

Students will be scored based on (1) their ability to correctly place shapes into the proper category (2-D or 3-D) and (2) on their ability to correctly label the shapes.



Student	Correctly sorted shapes	Number of shapes correctly labeled (out of 8)
Jude, Nathan, Sam, Taylor, Makayla, Sophia, Henry, Kaj, Jack, Riya, John, Collin, Vivian, Chloe, Sri, Bronwyn, Justin, Asher, Brooks, Si'ai	Yes	8/8
Jerry*	No	0/8 – did not attempt to label
Ioannis*	No	0/8 – did not attempt to label
Camryn	No – mixed sphere and circle	7/8 – labeled sphere as a circle

### Analysis:

- 86% of my students mastered this lesson. Of the remaining three, two of the students are English Language Learners. I believe the problem was the language in this lesson. The students were unable to understand my verbal directions and they may have been unable to accurately read the labels on the sort. I saw these students struggling so I asked them to work with me. I showed solid objects to these students and they were able to sort them into the categories of 2D and 3D. They were also able to verbally tell me the names of the shapes though they were unable to label them.
- The picture of the sphere on the sort was not as clear as it should have been. This may have been the reason why Camryn mixed up the circle and the sphere in her sort. However, as she was the only student to do this, I will review spheres and circles with her.

### Reflection:

A piece of my overall objective for this cycle of learning is for students to be able to sort shapes into the categories of 2-Dimensional and 3-Dimensional. I wanted to implement an activity that would allow me to see if the students were now able to sort shapes correctly into these categories based on the instruction I have given over the past few days on 3-Dimensional shapes. From the assessment, it seems only three of my students have yet to master this concept. However, Ioannis and Jerry were not able to demonstrate that they are able to sort 2-D and 3-D shapes, which leads me to believe the independent practice was not differentiated enough for them to be successful.

## Day Five

### Materials:

- 24 clipboards and pencils (clipboards are located on shelf next to the cubbies; pencils are located in the students' baskets on their tables)
- 21 copies of chart with 3-D shapes drawn and written at the top, 3 copies of chart with shapes **only written** at the top

**Learning Objective:** Students will be able to identify 3-Dimensional shapes in their environment by completing a chart and going on a shape hunt. They will be able to write at least one example of a cube, a cone, a sphere, and a cylinder that they see in their

environment.

**Introduction:**

- I will say to students, “Tap your head if you remember when we went on a shape hunt through the hallways for 2-D shapes two weeks ago. Which shapes did we look for? What objects do you remember finding?”

**Direct Instruction:**

- I will now say to the students, “Today we are going to practice naming 3-D shapes in our environment. We will do this by going on a shape hunt!”
- I will get a clipboard along with the chart with the different shapes labeled at the top. I will model looking for shapes in the classroom.

*Think Aloud:* “In order to find shapes in my environment, I have to remember what the different 3-D shapes look like. I know they are solid, that they usually have faces, sides, and edges. But, I can also reference the pictures on my paper if I need a little reminder. (Look around the classroom) Look! A ball! Let me look at my shapes on my paper. I know this shape isn’t a cube, cone, or cylinder because it has no faces, or flat sides. But I remember! It is a sphere! It even matches the picture of a sphere on my paper. So I will write “ball” under “sphere” on my paper.

**Guided Practice:**

- I will have the students go through the classroom. Once they have each found one 3-D shape, they will line up at the door.

**Independent Practice:**

- We will go on our shape hunt to find 3-D shapes. Students who have difficulty writing words will still be encouraged to write the words of the objects they see, but they will also be able to orally tell me what they saw as we walk as well as when we return to the classroom. I will encourage my students who were able to identify all or most of the 3-D shapes on the pre-assessment to look for other 3-D shapes besides the ones we have discussed thus far (i.e. rectangular prism, triangular prism, pyramid)
- For my English Language Learners, I will ask them as we walk to point out shapes they see. I will ask them to say the shape’s name, and I will tell them the object’s name if they cannot identify the object. They can then practice writing the object’s name under the correct category.
  - Chloe, Bronwyn, Asher, Henry, Vivian, and Sri’s charts will not have pictures next to the labels at the tops of their papers for an added challenge of identifying the shapes.

**Closure:**

- Once we come back to the classroom, I will ask the students to share some of the

objects they saw in the hallways and to identify which categories the objects they found fell under. I will ask (directed at Chloe, Bronwyn, Asher, Henry, Vivian, and Sri, but anyone may answer), “Did anyone see any shapes that did not fall into any of the categories listed on your papers?”

### **Assessment:**

The following students identified at least one real life object for each 3-D shape. This is considered mastery:

<b>Riya, Jude, Brooks, Bronwyn, Sophia, Ioannis, Si'ai, Jack, Collin, Justin, Taylor, Kaj, Nathan, Henry, John</b>	<b>These students demonstrated mastery of this lesson by identifying at least one real life object for each 3D shape on their charts</b>
<b>Vivian, Asher, Chloe, Sri, Makayla, Camryn</b>	<b>These students identified at least one real life object for each 3D shape and also listed shapes/objects that were not on their chart on the back of their papers</b>
<b>Sam, Jerry</b>	<b>These students both only re-wrote the names of the shapes in the columns. They were unable to identify real-life objects</b>

### **Analysis:**

- 91% of my students demonstrated mastery of this lesson. Two of my students were unable to demonstrate mastery.
- I am unsure as to why Sam and Jerry were unable to master this lesson. It may have been a misunderstanding of direction or a vocabulary issue. It would have been more beneficial for these two students to have been given a checklist or a list with objects' names already on them. Then they could have circled or checked off the objects they saw on the hunt and label the objects as being cones, cylinders, spheres, or cubes. This may have helped them to identify objects in the environment without being overwhelmed by direction or vocabulary.

### **Reflection**

Today I was concerned with how I would manage my class in the hallway. I tried to take every preparation to ensure that the students followed directions and stayed on task so they could obtain the most benefit from this lesson. I told the students my expectations before we went out into the hallway, and I tiptoed and whispered once we were in the hallway. These strategies worked perfectly, as the students remained in line and were quiet. I was impressed at the control both I and my students demonstrated throughout this lesson.

This lesson was very engaging for the students and I believe that is what ultimately allowed it to be successful. The students were very excited about our shape hunt, and they have become familiar enough with 3-Dimensional shapes that they all seemed to be able to easily

locate and identify a variety of cubes, cones, cylinders, and spheres. I am glad I placed the question on the back (Do you see any other shapes?) on every students' paper because it was not just the six students who I usually accelerate learning for who were able to accomplish the added task. Several other students were able to demonstrate their extensive knowledge of this unit by listing such other shapes as rectangular prisms.

### **Post Assessment:**

Students were assessed with the same method for the post-assessment as they were for the pre-assessment:

**Green: Demonstrated proficiency in each task**

**Blue: Did not achieve a perfect score, but demonstrated improvement from the pre-assessment and scored 89% or more on the post-assessment**

**Purple: Achieved a score of 78% or less and could not sort shapes correctly**

Student's Name	Sort Shapes Correctly	Identify 2-D shapes (squares, circles, triangles, rectangles, and hexagons)	Identify 3-D shapes (cubes, cones, cylinders, and spheres)	Comments	Total Performance	Percentage Improved from Pre-Assessment
John	Y	5/5	4/4		100%	+33%
Taylor	Y	5/5	4/4		100%	+44%
Jack	Y	5/5	4/4		100%	+44%
Chloe	Y	5/5	4/4		100%	+0%
Sophia	Y	5/5	4/4		100%	+34%
Kaj	Y	5/5	4/4		100%	+33%
Collin	Y	5/5	4/4		100%	+33%
Sam	Y	5/5	4/4		100%	+44%
Camryn	Y	5/5	4/4		100%	+44%
Ioannis	N	4/5	3/4	Confused sphere and circle	78%	+33%
Si'ai	Y	5/5	4/4		100%	+44%
Nathan	Y	5/5	3/4	Could not identify cylinder	89%	+22%
Jude	Y	5/5	4/4		100%	+44%
Justin	Y	5/5	3/4	Could not identify cylinder	89%	+33%
Riya	Y	5/5	4/4		100%	+55%
Jerry	N	5/5	3/4	could not identify sphere	89%	+33%

Henry	Y	5/5	4/4		100%	+11%
Vivian	Y	5/5	4/4		100%	+11%
Bronwyn	Y	5/5	4/4		100%	+0%
Makayla	Y	5/5	4/4		100%	+55%
Brooks	Y	5/5	4/4		100%	+33%
Sri	Y	5/5	4/4		100%	+11%
Asher	Y	5/5	4/4		100%	+0%

### **Overall Analysis and Evaluation:**

- 83% of my students achieved a perfect score on the post assessment. 96% of my students achieved a score of 89% or higher. One of my students achieved a score less than 80%.
- For the four students who did not achieve a perfect score on the post-assessment, two of these students are close to complete mastery of my objective. Nathan and Justin were both able to sort the shapes correctly into the categories of 2-Dimensional and 3-Dimensional. They both only missed identifying one of the 3-Dimensional shapes. Therefore these students will just need further instruction in the shapes they missed. However, Jerry and Ioannis are both English Language Learners. Therefore, I do not believe I effectively reached them in regards to learning the vocabulary of “2-Dimensional” and “3-Dimensional”. Neither of these students were able to sort the shapes correctly, though their scores improved in regards to being able to identify the names of all of the shapes. These students will need more explicit and individualized instruction in the meaning of 2-Dimensional versus 3-Dimensional as well as further instruction in the shapes they missed.
- All of my students demonstrated improvement from the pre-assessment to the post-assessment. All of my students were able to benefit from the lessons planned and implemented through this cycle of learning. I believe this is due to the differentiated instruction and independent practice I provided as well as the explicit instruction I provided in identifying the shapes. Every day of this cycle, shapes were constantly talked about, experimented with, and manipulated. This allowed my students to become familiar with the shapes. This also ultimately allowed my students to learn the shapes’ names.
- Some of my lessons were more successful than others during this cycle of learning. For example, the day 2 lesson about sliding, stacking, and rolling the different 3 dimensional shapes was not as strong of a lesson as I had intended it to be. The benefit my students received from this lesson was in the familiarity they gained with the different shapes and in the conversations they had with each other regarding the shapes’ attributes and capabilities. However, technicalities prevented some of my students from receiving the optimal amount of benefit from this lesson. This lesson may have been a better lesson if I had explicitly worked with each group of students in a small group. Then, I would have been better able to target my ESOL students as well as any other student who was having difficulty. This may have led to increased performance for these students at the end of this cycle.
- Due to the fact that the majority of my students did master the objectives targeted in these lessons, I consider this cycle of learning successful. Two students (Jerry and Ioannis) will need to be retaught how to sort shapes and to identify a sphere and a circle. Another two students will just have to be retaught how to identify a cylinder.
- Liam was a student who was absent for the whole week while this cycle of learning was

implemented. Therefore, though his data is present in the pre-assessment, I did not include it in the post-assessment since he was not present for the cycle.

## **Reflection**

There were a variety of successes and shortcomings in the lessons planned throughout this cycle of learning. If I teach these lessons again in the future, there are several changes I would make. For example, I would want to make more considerations for my English Language Learners. While each of my English Language Learners demonstrated improvement from the pre-assessment to the post-assessment, two of these students were not perfectly able to identify or sort all of the shapes. When teaching these students, I should have worked with them in a small group atmosphere every day of the lessons to ensure that they were hearing repetition of the vocabularies and to ensure that they understood the instructions. Furthermore, I should have used more pictorial clues when giving directions. This not only would have helped my ELL students, but also my student with an IEP. I could have written instructions on the board every day with pictures next to the instructions to help these students. In the future, I will want to ensure these considerations are made in the lessons I teach.

In some days of the lessons, specifically in day 2, I found that I had to modify the implementation of the lesson from the actual lesson plan. In doing so, I was able to understand how a teacher needs to have a variety of resources ready and available in case students need further instruction. By having a multitude of resources ready, even if it means differing from the plan, instruction can be altered to ensure it best benefits all students.

There were also successes in the lessons of this cycle of learning. The majority of my students demonstrated complete mastery of my objectives. The activities I planned and the differentiation I provided did seem to engage my students. In each day of lesson there was an aspect of differentiation, whether it was in the small group instruction, the guided practice, or the independent practice given to the students. This differentiation allowed me to support and extend learning where needed and to ensure all of my students were given tasks that they were capable of performing with scaffolding.

There were two very rewarding results of this cycle of learning. One such is in the post-assessment performance of my students. There was a large increase in students' knowledge from the pre-assessment to the post-assessment, and each of my students' scores increased to some extent. This result was very encouraging. The lessons I had planned and implemented were successful in teaching the students the curriculum and behavioral objectives that were the focus of this cycle.

Another rewarding instance I noticed in this cycle of learning was in how engaged my students were in each activity of this cycle. Every day I tried to incorporate collaboration among students. This has been a goal of my overall teaching to improve. I noticed through these lessons that when students work together, they can reach conclusions all on their own and increase the strength they make of the content of lessons. Furthermore, I tried to plan activities that allowed the students to have hands-on experiences and to make real-life connections. This was accomplished by having manipulatives ready and available for students and by having "real-life" 3-Dimensional shapes (cereal boxes, cans, etcetera) in the classroom for students to see and use. This was also accomplished by going on the 3-Dimensional shape hunt in Day 5 of the cycle of learning. This particular lesson excited the students and allowed

them to make great connections with the names of 3-Dimensional shapes, the attributes of these shapes, and the objects they see in their everyday environment.

I approached this cycle of learning as if I were teaching a unit. Each day, I wanted to teach a lesson that would lead students towards reaching my overall objective for the five days of lessons. While planning, I thought about how I could reach all of my students, how I could engage all of my students, and how I could use different tools to accomplish my objectives. Manipulatives were used, but so was technology. I used the kindergarten team at College Gardens as well as my mentor teacher to brainstorm possible lessons that would be successful in accomplishing my objectives. I also utilized the MCPS curriculum to identify lessons and resources that could further my goal.

Through this cycle of learning, I learned how to interpret daily data to inform instruction, how to differentiate instruction to help support and enhance learning for all students, and how to adjust plans to ensure that students receive the strongest instruction possible. I realized how these elements are what allow for effective lessons to be implemented and for ultimately, success to be fortified among students.