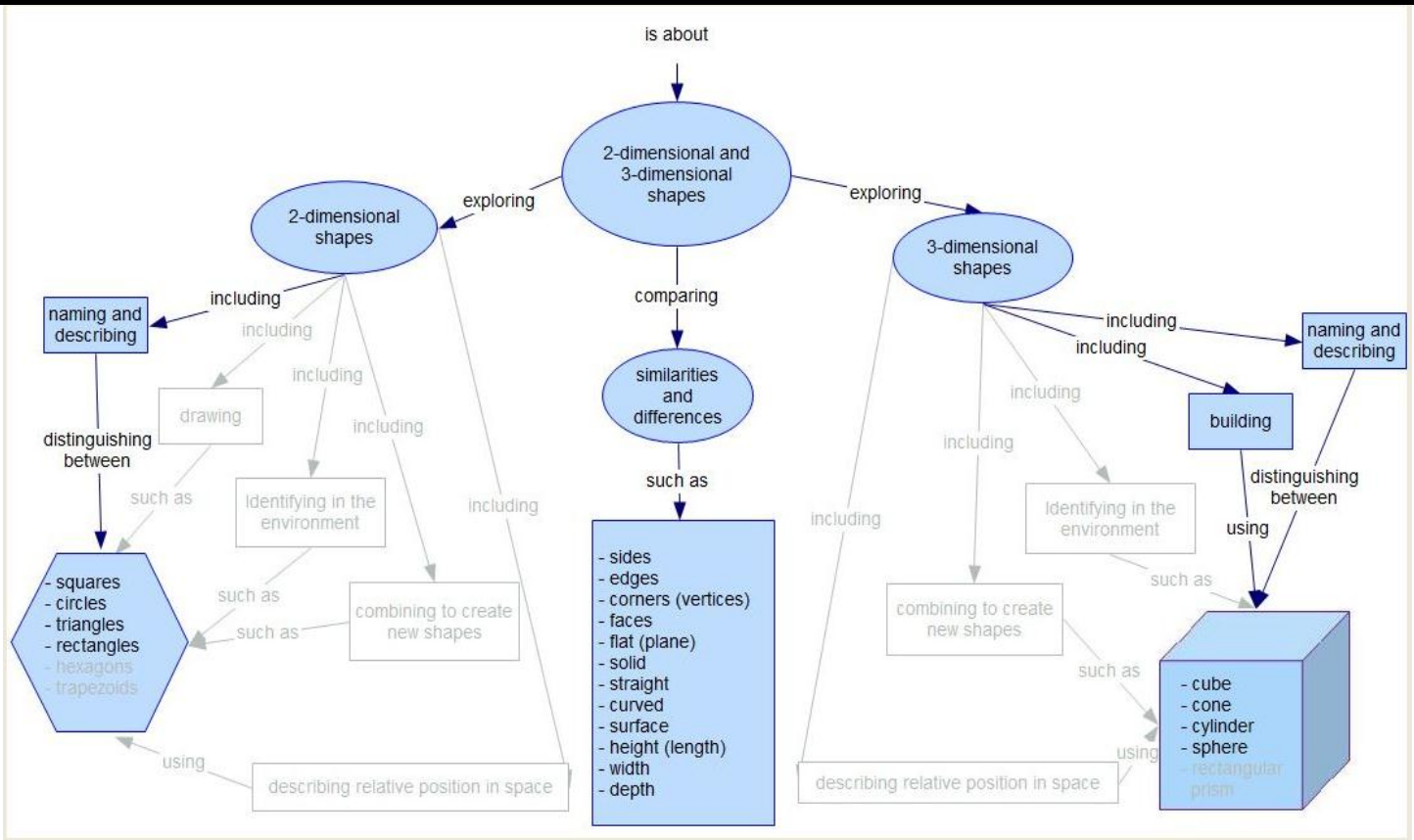
May 19, 2014

Kindergarten: Mathematics
Highlight Lesson
Unit 6: Exploring Attributes and Shapes – Part 2

Overarching Question What role do shapes have in our world?		
Previous Unit: Deepening and Extending Number	**This Unit:** Exploring Attributes and Shapes – Part 2	**Next Unit:** Building Number Patterns and Meaning



Question to Focus Assessment and Instruction:

1. What is the difference between a 2-dimensional and 3-dimensional shape?
2. What makes a cube (square, circle, sphere, cone, cylinder) a cube (square, circle, sphere, cone, cylinder)?
3. What is the relationship between the vertices, edges and faces of a 3-dimensional figure (cube, circle, sphere, cone, and cylinder)?
4. What 3-dimensional shapes do we see in our environment?
5. What shapes can we create by combining two or more shapes?

Intellectual Processes
Standards for Mathematical Practice

Students have opportunities to:

- ***construct viable arguments and critique the reasoning of others*** when describing and explaining the attributes of geometric shapes found in the environment and their relative position***;***
- ***uses appropriate tools strategically*** when combining shapes to create a larger shape;
- ***look for and make use of structure*** when comparing 2-dimensional and 3-dimensionsl shapes and when identifying geometric shapes in the environment; and
- ***look for and express regularity in repeated reasoning*** when recognizing that the name of the shape remains the same, regardless of its size and orientation and its location and physical features in the environment.

Key Concepts:

sort	squares	rectangles	3-dimensional	cylinder	pyramid	length	relative position
classify	circles	hexagons	cube	cone	flat	width	flat surface
attributes	triangles	2-dimensional	sphere	rectangular prism	solid	depth	curved surface]

Lesson Abstract:

This plan is for a three-day lesson series intended to be taught at the beginning of this unit. 2-dimensional shapes are reviewed before 3-dimensional shapes are introduced. Since describing the attributes of 3-dimensional shapes depends on knowing the names and attributes of 2-dimensional shapes, this review may indicate a need for some additional practice before beginning the unit. Having a "shapes poster" and "word wall words" displayed in the room and using drawings of shapes as labels (e.g., "the triangle table") keep these images and geometry language within reach of children on a daily basis. The purpose of this lesson series is to introduce cubes, cones, cylinders and spheres. The focus is on *describing the attributes* of these shapes. Although the teacher and students use the shape names to distinguish them during these lessons, and students will be expected to independently identify shapes by name by the end of the unit, the emphasis at the beginning of the unit is on the attribute vocabulary. Children will hold these shapes, explore them visually and kinesthetically, and then participate in a class discussion to describe them. Children hear and are encouraged to use the terms *solid, flat, curved, face, edge, and corner (vertex)* as they describe the features of these shapes. Displaying them on a word wall connects reading with mathematical words.

Common Core Standards

Geometry

K.G.A Identify and describe shapes (squares, circles, triangles, rectangles, hexagons, cubes, cones, cylinders, and spheres).

- K.G.A.1 Describe objects in the environment using names of shapes, and describe the relative positions of these objects using terms such as above, below, beside, in front of, behind, and next to.
- K.G.A.2 Correctly name shapes regardless of their orientations or overall size.
- K.G.A.3 Identify shapes as two-dimensional (lying in a plane, "flat") or three- dimensional ("solid").

K.G.B Analyze, compare, create, and compose shapes.

K.G.B.4 Analyze and compare two- and three-dimensional shapes, in different sizes and orientations, using informal language to describe their similarities, differences, parts (e.g., number of sides and vertices/"corners") and other attributes (e.g., having sides of equal length).

K.G.B.5 Model shapes in the world by building shapes from components (e.g., sticks and clay balls) and drawing shapes.

K.G.B.6. Compose simple shapes to form larger shapes. For example, "Can you join these two triangles with full sides touching to make a rectangle?"

Instructional Resources

- *The Shape of Me and Other Stuff*, by Dr. Seuss. (2001) Random House.
- A demonstration square, circle, equilateral, isosceles, and scalene triangle – each about 6 inches (or more) high (in Lesson Resources)
- Set of demonstration 3-dimensional shapes, including cube, cone, cylinder, and sphere
- Set of smaller 3-dimensional shapes for each student to handle, including cube, cone, cylinder, and sphere
- A sphere other than a ball (e.g., a globe or perfectly round orange or lime)
- PowerPoint for pre-lesson reviewing of 2-dimensional shapes, "2-Dimensional Shape Review" (in Lesson Resources)
- PowerPoint for lesson Summary, "Basic Shapes: 2-D and 3-D" (in Lesson Resources)
- 3-Dimension Attribute Checklist (in Lesson Resources)
- Any posters of 2-dimensionsl shapes that were created and/or displayed during Unit 1
- Word Wall _Vocabulary-Pictures (in Lesson Resources)
- Modeling clay or play dough
- 4" x 6" cards to store students' clay models, at least one per student

Sequence of Lesson Activities

Lesson Title: Exploring 3-Dimensional Shapes

Advanced Preparation:

- Read *The Shape of Me and Other Stuff* by Dr. Seuss as a read-aloud several days before beginning this lesson.
- Collect a set of solid geometric figures so that each student will have one of each shape to hold and explore.
- If small blocks are not available for each child to explore in this lesson,
  1. A variety of balls and party hats could be used for spheres and cones. Joanne Fabric and Michaels Arts and Craft stores have styrofoam balls and cones.
  2. Cans, toilet paper rolls, paper towel rolls, could be used for cylinders
- Collect a set of picture (e.g., from magazines, catalogs, clip art) that show 2-dimensional and 3-dimensional shapes to use for Formative Assessment and Independent Practice activities.
  - In a letter or newsletter to families, explain your need for these pictures, including size parameters. Ask them to send in pictures.
- Day 2: Save the shapes students created today so that they can be used on Day 3. If they need to be recreated on Day 3, the lesson could extend into a fourth day.
- You may choose to spread these lessons out over additional days so that, between these lessons, students have opportunities to explore informally 2-dimensional and 3-dimensional shapes and working with clay.

NOTE: The vocabulary used to identify the attributes of 3-dimensional shapes varies from source to source. Two examples: Some sources refer to the flat *faces* of cones and cylinders as *bases*. Some refer to the *point* of a cone as an *apex* or a *vertex*. In this unit, *face* will be used and the *vertex* of a cone can be called a *point,* unless "vertex" is a term students already know. Cones have one *face*; cylinders have 2 *faces*.

Selecting and Setting Up a Mathematical Task

By the end of this lesson what do you want your students to understand, know, and be able to do?	By the end of this lesson series, students will be able to • identify shapes as 2-dimensional (flat) or 3-dimensional (solid). • identify *faces, corners, edges, solid, flat* and *curved surfaces* as the distinguishing properties of a cube, cone, cylinder, sphere, when shown an example of the figure. • explain how 2-dimensional and 3-dimensional shapes are alike and how they are different.
In what ways does the task build on students' previous knowledge?	**Free Exploration:** Have clay or play dough out as a center for a period of time before beginning these lessons. It will be easier to focus on the mathematics of these lessons if students are familiar with working with clay or play dough. **Block Center:** Students are likely to have informal experience with 3-dimensional shapes over the course of their kindergarten year. You may already have used the vocabulary of 3-dimensional shapes when talking informally about the blocks. **Review:** In Unit 1, students learned about 2-dimensional shapes. They need to know those shapes and their attributes to be ready to learn about the attributes of 3-dimensional shapes. If there are misconceptions, address them before moving on to these lessons.
What questions would you ask to help students access their prior knowledge?	Using the PowerPoint "2-Dimension Shape Review", ask ▪ ***What is this shape?*** ▪ ***How do you know?, i.e., What* (are the attributes that) *makes a ___ a ___?*** Details and suggestions for ways to use this PowerPoint are included in notes within that document. Use Levels 1, 2, and 3 before beginning the following lesson. Level 4 is optional.

Day 1

Launch:

	On **Day 1,** you will introduce 3-dimension figures and how they differ from 2-dimentional figures, using squares and cubes, circles and spheres, as examples.
How will you introduce students to the activity so as to provide access to all students while maintaining the cognitive demands of the task?	Launch the lesson by reading *The Shape of Me and Other Stuff* (or other book that would support the following launch to this lesson) as a read-aloud. After you have read it, ask students how these shapes are different from the

ones they have been learning about. Of course, they will say they aren't squares or triangles or rhombi or trapezoids or rectangles. Point out that all the shapes in this book look flat like all the 2-dimensional shapes they've been learning about. Ask if these things in the book are flat "in real life". For example, *are people flat?* Point to the 2-dimension poster in your class and say,

These shapes are flat. We say they are 2-dimensional because they only have width and height (or length). Count on your fingers to two as you say this. Have students say "2-dimensional". Trace over the two dimensions as they respond.

Point to the 3-dimensional shapes you have gathered for this lesson. *All these shapes are fat or solid. They have height and width and depth.* Count on your fingers to three as you say this. *We call these shapes 3-dimensional shapes.* Have students say "3-dimensional". Trace over the three dimensions as they respond. Have a student stand next to you. Show the class how a person is 3-dimensional.

Have the Word Wall Vocabulary-Picture cards ready to post as you lead the following discussion. As you talk about each term, show the card with the word and picture and post it for the duration of this unit.

You have already learned a lot about 2-dimensional shapes. Now we are going to learn about 3-dimensional shapes. Hold up a square piece of paper.

- **Is this *2-dimensional* or *3-dimensional*?**

When students say, *2-dimensional*, add, *Yes, a square is 2-dimensional: it only has height* (gesture height on the square) *and width* (gesture width on the square.). *It's flat.* Hold up a cube.

- ***Does anyone know what this shape is called?***

Students may call it a "block". Say something like, *Yes, many blocks are shaped like this. We call a block shaped like this a cube.* If students call it a square, say, *Yes, the face of this shape is a square, but this shape is also solid; it has depth too.* (Turn the cube sideways and indicate depth). *We call it a cube. It has many faces that are shaped like a square.* Hold the cube in a way that you can show students all six faces, counting them as you point to each face. *It also has edges that connect the faces.* Point out the edges. *The edges and faces come together at corners (or vertices).*

Look around the room.

- ***Do you see anything in our room that is shaped like a cube?***

Your responses will depend on what students select. Some may point to a rectangular prism that has two square faces. Unless they are familiar with this term, e.g., because you have used it during the year to name the blocks, don't label this shape at the moment, but say that this shape is called something else because only two of its faces are square.

- ***What is the difference between a square and a cube?*** *Turn to your shoulder buddy and talk about that.*

As you elicit what students talked about, reinforce/model the vocabulary of geometry. Listen for *2-dimensional or 3-dimensional, face, edge, corner (vertex), solid/fat, flat.* Revoice students' statements if they use non-mathematical terms.

Hold up a paper circle.

- ***What shape is this?***
- ***Is it a 2-dimensional or 3-dimensional shape?***
- ***Why?***

Now hold up a sphere.

- ***Is this 2-dimensional or 3-dimensional?***
- ***How do you know?***

Show students how it has height, width, depth.

- ***What do we call this shape?***

Students will likely say a "ball" and probably won't know the word sphere. Say

	something like, *this object is a ball, but everything that is shaped like this is called a sphere.* Have student say "sphere". It's a difficult word for kindergarteners to say; it most often is pronounced "spear". *Look around the room.* ▪ ***Do you see anything in our room that is shaped like a sphere?*** It is less likely for you to have spheres other than balls. Perhaps you also have blocks that are spheres. Bring other things into the classroom for this unit, such as a globe or a round orange or lime to help students see that a ball is only one example of a sphere. ▪ ***What is the difference between a circle and a sphere?*** *Turn to your shoulder buddy and talk about that.* Again, as you elicit what students talked about, reinforce/model the vocabulary of geometry. Listen for *2-dimensional or 3-dimensional, solid/fat*. Ask if a sphere has edge, corners, flat faces. Introduce the term *curved surface* to describe the surface of a sphere. ▪ ***How many of you like to make things with clay (or play dough)?*** ▪ ***What are some of the things you know about working with clay?*** o You squeeze it in your hands to make it soft and easy to work with. o You can roll it, poke it, pinch it, pull it, pound it, change its shape o You don't put it in your mouth. *Today you're going to work with clay to make some cubes and some spheres. You can make little ones or bigger ones. I think you all know how to make a sphere.* As you say this, model rolling a sphere in your hands. *It's a little more difficult to form cubes out of clay. There are (linking, wooden) cubes at your table to help you see what cubes look like while you are working with your clay, but I'm going to show you how I might make a cube. A cube has edges and corners, so it's trickier to make than a sphere*. As you model for students, think aloud, talking about *flat faces, edges,* and *corners* (or *vertices).* *When you are finished in your center (or with math time), I'll ask you to bring your sphere and cube to the gathering area, and we're going to talk about them.*
What will be heard that indicates that the students understood what the task is asking them to do?	*Now turn to your shoulder buddy and talk about what you are going to do.* Ask students to restate the directions, looking for 1. Make a cube out of clay 2. Make a sphere out of clay ***What questions do you have before you begin?***
Explore:	
What questions will be asked to focus students' thinking?	You may choose to set this up as a center activity or as a whole class activity. If it's a center activity, students can put their shapes aside on a piece of paper with their names on it until all students have moved through that center and have shapes to talk about. ▪ ***What is important to think about when you are making a cube?*** Listen for students to say that it's 3-dimensional, that it has flat sides, edges, and corners. They may not be able to recall those mathematical terms yet, so you can point to the vocabulary cards to support students. The attributes of 3-dimensional shapes will continue to be a focus during this unit. ▪ ***What is important to think about when you are making a sphere?*** Students are likely to say they will roll the clay into a ball. ▪ ***Which of these shapes do you think will be easier to make? Why?***

	If students have not worked with clay before, they may need more time to explore and discover its attributes before they are ready to make their "final products". Monitor students as they work to see if any of them are experiencing difficulty with the task. They may need some help with their cube, but all students should be able to be successful making a sphere, as long as they know how to roll the clay and shape it with their hands.
How will you extend the task to provide additional challenge?	Look also for students who find this task easy. They may be able to help a classmate form the flat faces and edges of their cube by holding the clay for him or her. These same students might be "helping partners" on Day 2, when students will be making cones.
Summary:	
What specific questions will be asked so that students make connections between the different strategies that are presented? What will be seen or heard that indicates all students understand the mathematical ideas you intended them to learn?	Bring the class back together with their shapes and ask them what they noticed about cubes and spheres today. Record what students share. Pose additional questions, as needed. ▪ ***Turn to your shoulder buddy and tell him/her what we call shapes that have only height and width?*** Ask a couple students what their partner said and ask if they agree. ▪ ***What is an example of a 2-dimensional shape? If you think of one, put a quiet thumb up under your chin.*** Call on students until all the 2-dimensional shapes they know have been named. Ask students about and point out the attributes of 2-dimensional shapes, referring to the word wall vocabulary. ▪ ***What do we call the shapes that are solid, that are wide and high and deep?*** ▪ ***What 3-dimensional shapes did you make today?*** Ask students about and point out the attributes of 3-dimensional shapes, referring to the word wall vocabulary. *When we began our lesson, we looked at a 2-dimensional shape – a square – and a 3-dimensional shape – a cube.* Hold up the demonstration cube next to the square. ▪ ***What did we learn is different about a 2-dimensional shape and a 3-dimensional shape?*** Students will explain in a way that indicates they recognize that a 2-dimensional shape is flat and a 3-dimensional shape is deep, fat, solid, or another term that let's you know they understand the difference. *Tomorrow we're going to talk about more shapes and you will have a chance to work with clay again.*
Day 2	
Launch:	
How will you introduce students to the activity so as to provide access to all students while maintaining the cognitive demands of the task?	On **Day 2**, you will follow the same format as for Day 1, looking today at a *cone* and a *cylinder.* Launch the lesson with a quick review of what you talked and did on Day 1. Hold up a square. Run your finger down the side of the square. ▪ ***What do we call this?*** (a side). Run your finger around the corner of the square. ▪ ***What do we call this?*** (a corner or vertex). Give each child a cube to hold. *I want you to spend two minutes looking at the cube in your hand and talking with your elbow buddy about everything you notice about it. Then we are going to talk about it.*

- The vocabulary and concepts you want to emerge from this conversation, with the help of the word wall, are: *square, cube, flat, solid, corner, edge, face*. Hold up your larger/demonstration cube, pointing to the features as you label them. Have students touch the same feature on their cube, saying the name of the feature as they do so.

What were the other shapes we talked about yesterday? (a circle and a sphere)

Let's look at a sphere.

- ***Is a sphere solid or flat?***
- ***Does it have any corners? Edges? Flat faces?***

All of a sphere's surfaces are curved. Spheres don't have corners, edges, or flat faces. Talk about the word "curved" and what it means.

Today we are going to learn about two more shapes.

Hold up a demonstration isosceles triangle.

- ***What is this shape?***
- ***Is this a 2-dimensional shape or a 3-dimensional shape? How do you know?* (It's flat.)**
- ***How many sides does it have? How many corners?***

Hold up a cone.

- ***Is this a 2-dimensional shape or a 3-dimensional shape? How do you know?*** *This shape is a cone.*
- ***What items do you know about that are shaped like a cone?***
- ***What is the difference between a triangle and a cone?***
- ***Does a cone have a flat face? How many?***
- ***We call the other surface of a cone a curved surface.***
- ***Does it have edges? How many edges?***
- ***Does it have any corners?*** **This will be more challenging, because they know the vertex of a cone does not look like the corner of a square or cube. At this point, students can call this a *point.***

Hold up a cylinder.

- ***Is this a 2-dimensional shape or a 3-dimensional shape? How do you know?*** *This shape is a cylinder.*
- ***What items do you know about that are shaped like a cylinder?***
- ***Does a cylinder have a flat face? How many?***
- ***We call the other surface of a cone a curved surface.***
- ***Does it have edges? How many edges?***
- ***Does it have any corners?***

Today you're going to work with clay to make some cones and some cylinders. You can make little ones or bigger ones. There are cones and cylinders at your table to help you see what they look like while you are working with your clay

- ***What are some of the things you did with the clay to make your cube and sphere?*** (squeeze it, roll it, poke it, pinch it, pull it, pound it, etc.)
- ***Do you think you will be doing some of the same things when you form a cone and a cylinder? Which of these shapes do you think will be easier to make? Why?***

You might find cones a little difficult to create with clay, so I'm going to make one as you watch me closely. Carefully sculpt a cone, talking about what you are doing as you form it (i.e., flat face, curved surface, pointed at the top. When you have finished, ask them what they saw you do (e.g., warm the clay in your hand, look carefully at the model, experiment making the shape the way you wanted it to look).

Now watch while I make a cylinder. Again talk about the attributes of a cylinder as you create it (i.e., curved surface, flat faces)

	If you need help making these shapes, you might work with a partner to help each other. *When you are finished in your center (or with math time), I'll ask you to bring your cone and your cylinder to the gathering area, and we're going to talk about them.* *Now turn to your shoulder partner and talk about what you are going to do.* Ask students to repeat the directions, looking for 1. Make a cone out of clay 2. Make a cylinder out of clay 3. Help each other if you need help ***What questions do you have before you begin?***
Explore:	
What questions will be asked to focus students' thinking? How will you extend the task to provide additional challenge?	Monitor students as they begin the task. Ask questions that will help them get started and help them think about the distinguishing attributes of each shape. ▪ ***What is important to think about when you are making a cylinder?*** ▪ ***What will you do first?*** ▪ ***What will you do to make flat faces?*** ▪ ***What is important to think about when you are making a cone?*** ▪ ***What will you do to make a flat face and then make a point?*** If students need some help, suggest that they work together with a partner to help each other. Those who need additional challenge can be the "helping partner" to those who find this task difficult.
Summary:	
What specific questions will be asked so that students make connections between the different strategies that are presented? *What will be seen or heard that indicates all students understand the mathematical ideas you intended them to learn?*	Bring the class back together and ask them what they learned about cones and cylinders today, using the word wall as cues for using math vocabulary. ▪ ***Turn to your elbow buddy and talk about what you learned about cones and cylinders.*** As you elicit what students talked about, record their explanations. Ask the following questions if these attributes aren't mentioned. ▪ ***Does a cone have an edge?*** ▪ ***Does a cone have a corner?*** (Students can refer to the vertex as a point for this unit. It does not meet the definition of a corner.) ▪ ***Does a cone have a face?*** (It has one face.) ▪ ***Is there another surface on a cone?*** Students may point to the curved surface. Remind them of the term "curved surface." ▪ ***Do any of our other shapes have a curved surface?*** Go through the same sequence of questions about a cylinder. Pose additional questions, as appropriate. *Turn to your elbow-buddy and tell him/her what we call shapes that have height and width and depth.* Ask a couple students what their partner said and ask if they agree. ▪ ***What 3-dimensional shapes have we worked with yesterday and today?*** *If you think of one, put a quiet thumb up under your chin.* Call on students

	until the four 3-dimensional shapes have been named. ▪ ***And what do we call the shapes that are flat, that are only wide and high? What 2-dimensional shapes do you know?*** *Tomorrow we're going to talk about more about the attributes of 3-dimensional shapes.*
Day 3	
Launch:	
How will you introduce students to the activity so as to provide access to all students while maintaining the cognitive demands of the task? What will be heard that indicates that the students understood what the task is asking them to do?	The lesson today ties together what students have been doing for the first two days of this lesson sequence. Launch the lesson by reading one of the shape books listed in the Unit Resources, stopping at key points to relate the book to what students have been doing and talking about. *Let's look at the shapes we have been talking about this week.* Show the "Basic Shapes PowerPoint," omitting the last two slides (rectangular prism and pyramid) ▪ ***How did you determine the name of the shapes?*** Student responses will reflect their knowledge and understanding of properties and their ability to describe those properties. Their vocabulary may vary. Show students the demonstration square and cube. Have a student name them. ▪ ***How these shapes are different?*** ▪ ***How are they alike?*** Show students the demonstration circle and sphere. Have a student name them. ▪ ***How these shapes are different?*** ▪ ***How are they alike?*** Show students the demonstration triangle and cone. Have a student name them. ▪ ***How these shapes are different?*** ▪ ***How are they alike?***
Explore:	
What questions will be asked to focus students' thinking?	Each student will need to have his/her clay *cube, sphere, cone* and *cylinder* In front of them to examine. Keep the 4" x 6" card under the shapes. Students need to sit next to a partner so that each student can talk about the shape he is holding. In the interest of holding students' attention, it would be ideal if students could sit together on the floor for this activity. *Today we're going to talk about all the things we have learned about 3-dimensional shapes this week. We're going to do this activity together.* *When I tell you to move, please* 1. *Carefully bring your name card and your 3-dimensional shapes with you to the gathering area,* 2. *Find a place where you and your math buddy have space to work without being in anyone else's space* 3. *Sit knee-to-knee with your partner* 4. *Look at me.* *Let's see who can remember all four of those directions.* ▪ ***___, what's the first thing you are going to do?*** Continue until the directions have been restated. *You're going to get started by picking up your cube and looking at it very closely.* ▪ ***How would you describe it?*** ▪ ***Does it have any flat faces? Does it have edges? Does it have corners? Does it have any curved surfaces?***

	Point to those word cards as you say the words. *After you have looked at your cube, talk to your math buddy. See if you both discovered the same thing. When you hear me say "cube", stop and look at me. We will talk about what you have all learned about cubes.* (See Discussion, below.) Ask what questions they have before they begin. **Discussion:** Project the "3-Dimensional Attribute Checklist" so that you can write on the board, a transparency, or paper under a document camera. Begin with the cube. *Let's see what we learned about these four shapes today. What did you are your partner decide about a cube? Next to the picture of the cube, it says, Faces, Edges, Corners. We're going to look at our* ***cube*** *and decide if a cube has these attributes.* ▪ ***Does it have faces?*** (Yes). After they answer, tell students to touch each of the faces on their cube (without counting them). Put a check mark after the word Faces. ▪ ***Does it have edges?*** (Yes). After they answer, have them touch each of the edges on the cube (without counting them). Put a check mark after the word Edges. ▪ ***And does it have corners?*** (Yes). After they answer, have them touch each of the corners on the cube. Put a check mark after the word Corners. Proceed to examine the cone, cylinder and sphere in the same way. If a shape does not have one or more of these attributes, leave the line blank. For a cone, students might want to cross out "corners" and write in "point."
How will you extend the task to provide additional challenge?	If students need an additional challenge, ask them to count *how many* faces, edges and corners the shapes have. If they do, they may want to contribute this to the information you are recording.
Summary:	
What specific questions will be asked so that students make connections between the different strategies that are presented? ? Tell me what you learned from working with the solid figures. (You may wish to document what you learn from the students and use it to plan the next lesson.) What will be seen or heard that indicates all students understand the mathematical ideas you intended them to learn?	When you have completed recording, have students look at what they discovered. ▪ ***What shapes have flat faces?*** ▪ ***What shapes have curved surfaces?*** ▪ ***Is there a shape that does not have any flat faces?*** ▪ ***Do they all have edges? Which shape does not have edges?*** ▪ ***Do they all have corners? Which shapes do not have corners?*** o cube: faces, edges and corners o cone: face, edge, no corners (but has a point) o cylinder: faces, edges, no corners o sphere: no faces, edges, or corners *Let's look back at the book we read at the beginning of our first lesson,* e.g., *The Shape of Me and Other Stuff*, by Dr. Seuss. Go to the page that has the bug, balloon, bed, bike and the fish, boat, boy, girl on the next page. One at a time, ask, ▪ ***Are these 2-dimensional or 3-dimensional in real life? How do you know that?*** ▪ ***What have you learned from working with 3-dimensional shapes?*** What students say may inform your planning of the next lesson. Conclude with, *in a book pictures are 2-dimensional; they are all flat; they have height and width. In real life these things are 3-dimensional; they are solid; they have height and width and depth.* *We're going to learn lots more about 3-dimensional shapes, because in our*

	next lessons, we're going to look around us and see all the things in our lives that are shaped like cubes or spheres or cones or cylinders, and we're going to use the shapes that we know to make other shapes.

