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Shapin' Up in 1st Grade [1st Grade Geometry - Shapes 2D & 3D Unit]

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1st grade Shapes UbD

<table>
<tr><th colspan="3">Stage I – Desired Results</th></tr>
<tr><td rowspan="6">Established goals

1.6 The student applies mathematical process standards to analyze attributes of two-dimensional shapes and three-dimensional solids to develop generalizations about their properties. The student is expected to:
(A) classify and sort regular and irregular two-dimensional shapes based on attributes using informal geometric language
(B) distinguish between attributes that define a two-dimensional or three-dimensional figure and attributes that do not define the shape
(C) create two -dimensional figures, including circles, triangles, rectangles, and squares, as special rectangles, rhombuses, and hexagons
(D) identify two-dimensional shapes including circles, triangles,</td><td colspan="2">Transfer</td></tr>
<tr><td colspan="2">Students will independently use their learning to
● Recognize and describe 2- and 3D shapes</td></tr>
<tr><td colspan="2">Meaning</td></tr>
<tr><td>Understandings
Students will understand that .
● Shapes are given names according to their attributes
● Shapes have characteristics in common
● We use and see shapes everyday</td><td>Essential Questions
● Why is that a ____?
● How is a square a rectangle?
● Where would you find a _____?</td></tr>
<tr><td colspan="2">Acquisition</td></tr>
<tr><td>Knowledge
Students will know
● Shapes can vary in size, color, and orientation while keeping the same characteristics of edges and vertices
● Shapes with the same characteristics share the same name, even if they may look a bit different
● The names of common shapes and solids
● Polygons must have straight sides and be closed</td><td>Skills
Students will be able to
● Analyze and describe attributes of shapes and solids
● Classify and sort shapes
● Distinguish between regular and irregular shapes
● Create shapes using a variety of materials, such as pattern blocks, tanagrams, and nets
● Identify 2 and 3-dimensional shapes by their attributes
● compose two-dimensional shapes by joining two, three, or four figures to produce a target shape in more than one way if possible
● distinguish between an open and a closed shape
● identify shapes in everyday objects</td></tr>
</table>

rectangles and squares, as special rectangles, rhombuses, and hexagons and describe their attributes using formal geometric language (E) identify three-dimensional solids, including spheres, cones, cylinders, rectangular prisms (including cubes), and triangular prisms, and describe their attributes using formal geometric language (F) compose two-dimensional shapes by joining two, three, or four figures to produce a target shape in more than one way if possible Process Standards: 1.1A apply mathematics to problems arising in everyday life, society, and the workplace 1.1C select tools, including **real objects, manipulatives,** paper and pencil, and technology as appropriate, and techniques, including mental math, estimation, and number sense as appropriate, to solve problems 1.1D communicate mathematical ideas,		

reasoning, and their implications using multiple representations, including symbols, diagrams, graphs, and language as appropriate 1.1G display, explain, and justify mathematical ideas and arguments using precise mathematical language in written or oral communication		

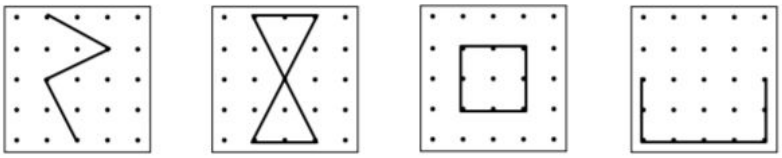
Vocabulary: Open shape, Closed shape, Polygon, Regular, Irregular, Side(s), Vertex, Two-dimensional, Attribute, Circle, Triangle, Rectangle, Square, Rhombus, Hexagon, Three-dimensional, Face, Edge, Cone, Prism, Pyramid, Sphere, Cube, Cylinder, Rectangular Prism, Triangular prism

Stage II – Acceptable Evidence

Evaluative Criteria (for rubric)	I can create and name a shape when I have the characteristics. I can name and describe the attributes of a shape when I have the picture. I can describe how shapes are similar. I can give the name and example of a 3D shape seen in daily life.
(see Performance)	Performance Task(s) *Students will demonstrate meaning-making and transfer by* (See Shapes Performance Task) Overview: Using 3 dice, students complete 4 tasks. Students draw and describe shape using vocabulary when given a picture. Students draw and name shape when given its attributes with justification for their answer. Students list how shapes 1 and 2 are similar or different. Students name and describe a 3D shape. --- Other Evidence (e.g., formative) 2D shapes ChatterPix (day 7) Making Hexagons (day 10) Shape Art (day 14)

Stage III – Learning Plan

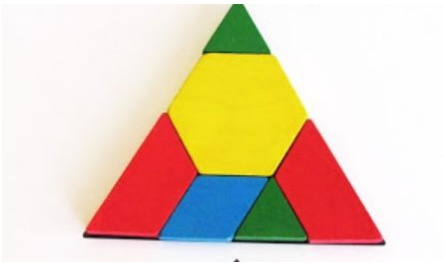
CODE (A, M, T)	Pre-Assessment *How will you check students' prior knowledge, skill levels, and potential misconceptions?*

	(see Shapes Pre-Assessment) Part 1: draw Part 2: matching identification	
A	**Learning Activities** **3 weeks** **Days 1-7: what makes a shape and shape names** Day 1: Make fences – open and closed, names of sides and vertices Materials: ● geoboards ● rubber bands ● (optional) small farm animals ● Math notebooks EQ Focus: Why is that a ____? Goals: Students will be able to describe the difference between open and closed shapes, and will begin to develop understanding of polygons. Display 4 geoboards similar to these. Explain that these are all fences for a farm animal. Turn-and-talk: which one of these would make the best fence?  A B C D Determine that shape C is the best design because the animal couldn't escape but still has room to run around. As a class discuss how many sides the fence has, and how many corners. Begin to introduce the terms sides and vertices, as well as polygon (closed shape with straight sides and no overlapping lines). Have students create a fence for an animal. When they have finished, count the sides. Compare shapes in groups of 3-4. Have groups discuss how their fences (polygons) are similar and different. (optional) record polygons on a chart, bar-graph style, and discuss similarities and differences of characteristics of polygons with same number of sides As a class create a definition of polygons, open and closed shapes. Have students record in math notebook, or print and glue in next day.	Progress Monitoring (e.g., formative data) Working definitions

A	Day 2: Sort shapes (see Sorting Shapes handout) Materials ● Shapes (pre-cut) ● Math notebook EQ Focus: Why is that a ____? Goals: Students will classify shapes into a variety of categories using geometric vocabulary. Either pre-cut out shapes or allow students time to cut out their shapes. This can be done as an individual activity or a partner activity. Ask students to sort shapes into categories. Have students record the category titles and shape letters in math notebook. Compare categories and sorting with another group and explain why both ways of sorting are correct. Then, work as a group to organize the shapes into yet another set of categories. Come together as a class after each student/group has been able to organize shapes into different categories. On an anchor chart record category names and examples, encouraging vocabulary: sides, vertices/corners, equal, same, etc... In math notebook record words: sides, vertices/corners, equal, same, and any other words your class discussed with pictures.	Working definitions
A	Day 3: Shape name, vertices, sides, and examples anchor chart Materials ● Anchor chart ● Pre cut shapes and examples ● Math notebooks EQ Focus: Why is that a ____?, How is a square a rectangle? Goals: Students will be able to identify and describe the attributes of common shapes. Complete anchor chart Before lesson cut out shape examples in color paper (remember to cut both regular and irregular versions of the shape) and pictures of examples (or you may draw them if you are more artistically skilled than me)	Anchor chart discussion
M		

M A	Day 4: Shape clues (see Shape Clues handout) Materials ● Pre-cut shape clues ● Clipboards ● Math notebooks EQ Focus: How is a square a rectangle? Goals: Students will use their knowledge of shape name and characteristics to solve clues. Post shape clues throughout the room. Have students work in pairs or individual to solve the clues. After students have had a chance to visit all cards, students spread out so there are an equal number of students at each card. The group gets time to discuss which shape they have then each group come forward to read their clue and share the answer. This is a good day to do a matching/sorting activity with shape names, attributes, and pictures as well. Day 5: Create and describe (see Making Shapes handout) Materials: ● Mini-marshmallows ● Pretzel rods EQ Focus: Why is that a ____? Goals: Students will create shapes and describe their characteristics using tangible pieces. (If you don't want to use food, or if you want students to post their work, I would recommend play-doh and toothpicks, or q-tips.) Students will follow along the picture clues on the handout to create a variety of polygons. Students will then challenge themselves to describe the attributes of the polygons they build and name the shapes that other students build. As a class, discuss what the marshmallows represent (vertices) and what the rods represent (edges). Day 6: Tally the number of shapes you see, I spy style (see I Spy Shapes) Materials	Group presentations of shape Discussion

M A	● I Spy Shapes page ● Colors EQ Focus: How is a square a rectangle? Goals: Students will use their knowledge of shape attributes to locate and name shapes. Day 7: Chatterpix of a shape Materials ● iPads EQ Focus: Why is that a ____? Goals: Students will use their knowledge of shapes to identify shapes in the classroom and school and create a unique list of characteristics. Students search through the room (and school) for unique examples of shapes, then use the ChatterPix app to have the shape share its name and describe its attributes. Students are required to complete 2 shapes, but are able to complete more if the time and resources are available. Using a QR code generator I convert the links into scannable QR codes and print on a page with the shape name and post on the wall outside our classrooms. When another class does this activity we go to scan theirs. During stations, students are able to scan their classmates QR codes and use as a prompt for math writing station. **Days 8-10: composing and creating shapes** Day 8: (see Composing Shapes handout) Materials ● Shape blocks Making hexagon Students receive a hexagon block. *Turn-and-talk: What shape is this? How do you know?* Discuss as a class the attributes and name of this shape. Students receive a trapezoid. *Discuss with your partner, what shape is this and how would you describe it?* *Can you make a hexagon with this shape?* If students combine their trapezoid with their partners but using the long side, they will see a trapezoid. Students receive a small pile of triangles. Discuss what shape's name is, and their attributes. *Is there a way to make a trapezoid with the triangles?*	Accuracy of worksheet ChatterPix

M	*Is there a way to make a hexagon with the triangles?* *Is there a way to make a hexagon with using both the triangles and a trapezoid?* If you want to dig deeper, or advance for higher students you can also use the rhombus piece to create a hexagon when combined with triangles and/or a trapezoid. Day 9: Materials ● Shape blocks ● Dice 1 (from performance task) Goals: Students will explore using known shapes to compose new shapes using shape blocks. Challenge students to create shapes from their shape cubes. My favorite is the large triangle.  Build it up Use the 2D shape picture dice (from the performance task) to create a fun and challenging game of building. A partner set gets a dice and a collection of shape pieces. Each partner takes turns rolling the dice and building their tower. Their goal is to build up, but stable. Because, the one who knocks their tower over loses that round. Day 10: Formative Assessment (see Making Hexagons handout)	Discussion Individual conferences during composing shapes activity
M		
A	Students will complete Making Hexagons handout individually. For most students, I allow them to use the shape blocks on their table for this. **Days 11-13: 3D shapes** Day 11: Giant 3D shapes Materials ● Butcher paper ● Nets (optional) ● Tape ● Notecards	

M T	● Fishing line or yarn to hang shapes from EQ Focus: Why is that a ____? Goals: Students will explore 3D shapes by using nets and examples of common 3D objects. Use nets like the ones you can download for free at thecraftyclassroom.com to create giant 3D shapes hang from ceiling with examples. While the shapes are still in their net form, ask students what the shape will look like when it is folded. This helps especially when students use the phrasing, "I think it will look like a…" Hold the shape together so students can see the shape. Ask if anyone knows the shape name, if a name doesn't come forward, discuss with students. Unfold the shape to write the name in large letters. Tape the shapes together and count and label the vertices and edges, recording the information on a notecard and gluing to the base. As a class create a list of real life examples where you can find this shape. Use this list to go back later and create hanging notecards with pictures to hang off the base. Then hang the giant shapes from the ceiling as an "anchor chart." Day 12: Matching Triple Play (Using the Triple Play strategy from the Lead4ward Instructional Strategies Playlist) Materials ● Paper EQ Focus: Why is that a ____? Goals: Students will work in groups to practice and review new vocabulary. Divide students into groups of 3 (if you do not have enough students to do this partner lower students with a middle or higher student that can support them) In each group assign each student a role. A = write the shape name B = write the characteristics of the shape C = draw a picture of the shape Then assign each group a shape. You can use this day/activity to focus on 3D shapes or you can incorporate 2 and 3D shapes and do a broader review. Students stand in a circle around the room, then crumple their paper and throw into the circle. Students will throw 2 more wads of paper before picking up the nearest paper. Students unfold their paper and work to find their group of 3. When students find their group they raise their hands and shout, "We did it!"	Discussion Ability

T T	If you have extra time or an extra day, you can also complete a marshmallows and pretzel set of 3D shapes. Day 13: STEM tower with triangular prism, rectangular prism, cylinder Materials ● 3 sheets of paper per group ● Assortment of books ● Chart paper to make graph (optional) Goals: Students will create 3D shapes using their knowledge of attributes to test the structural integrity of different prisms. Divide students into group of 3-5. Give each group 3 sheets of paper and instruct them to make a triangular prism, rectangular prism and a cylinder out of each piece of paper. (these will not include the base so simply fold the paper into 0, 3, or 4 sections) Stack books, one-at-a-time, on the tower and record how many books each tower can hold. As an extension, I like to graph the results from each group to determine a "winner" and to reinforce graphing concepts. **Day 14-15: performance assessment** Day 14: Shape art Materials ● either legal paper, or 11x17 construction paper ● variety of paint ● paint brushes ● cups for water Goals: Students use their knowledge of shapes to create a unique piece of art. Students will receive a large white paper (either legal paper, or 11x17 construction paper) and access to a variety of colors of paints. Teacher then reads requirements pausing between each to give students adequate time to create their art. (I also like to put on energizing music in the background) The uniqueness of this art comes from the idea that all students are given the same requirements, but create such different pieces of art. *Draw 4 squares.* *Draw 2 trapezoids.* *Draw 1 circle.* *Draw 5 triangles.* *Draw 2 hexagons.*	

	Day 15: Performance Task Materials ● 3 dice ● Recording sheet (if using option 2) ● Rubric Goals: Go over the rubric with students before completing the task so students know expectations.	

Vocabulary List:

Open shape – a shape that does not close, like a fence with an open gate

Closed shape – a shape where all the sides meet, like a fence with a closed gate

Polygon – a closed shape with straight sides

Regular – sides in a polygon are equal in length

Irregular – sides in a polygon are not equal in length

Side(s) – the flat or curved lines on a 2D shape

Vertex/corner – the point where 2 lines meet on a shape

Square corner – a corner on a shape that makes a square

Two-dimensional – a flat shape

Attribute/characteristics – ways to describe a shape

Circle – a closed shape with no straight sides, perfectly round

Oval – a closed shape with no straight sides, not perfectly round

Triangle – a polygon with 3 corners and 3 sides

Rectangle – a polygon with 4 square corners and 4 sides and 2 sets of equal sides

Square – a polygon with 4 square corners and 4 equal times

Rhombus – a polygon with 4 corners and 4 equal sides

Hexagon – a polygon with 6 sides and 6 corners, can be regular or irregular

Three-dimensional – a shape that takes up space

Face – the flat part of a 3D shape

Edge – the bend in a 3D shape, where a fold would be in a net

Vertex – the corner where edges on a 3D shape come together

Net – a template used to make 3D shapes from 2D paper

Cone – a 3D shape with a circle base that comes to a point

Prism – a 3D shape that is a stretched version of its base

Pyramid – a 3D shape similar to a cone, but its base is a polygon

Sphere – a 3D circle

Cube – a 3D shape with 6 faces that are all equal in size

Cylinder – a 3D shape with 2 circle bases

Rectangular Prism – a type of prism where the bases are rectangles

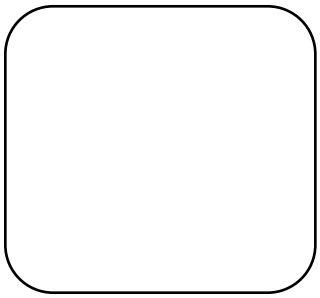
Triangular prism – a type of prism where the bases are triangles

Name: _____

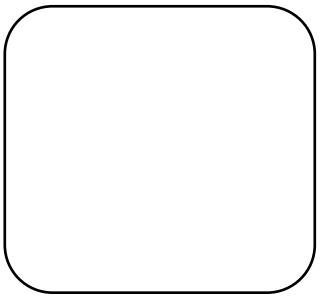
Shapes Pre-Assessment

Draw

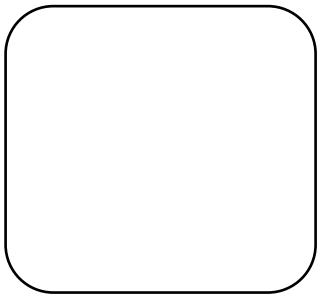
a triangle



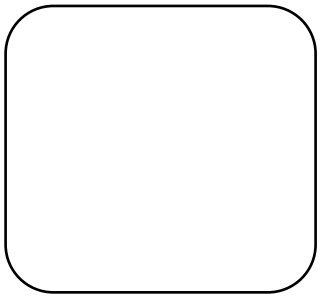
a rhombus



a shape with 5 sides

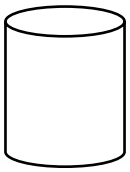


a hexagon

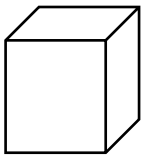


Matching Draw a line connecting the word to the image.

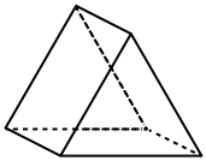
Cone



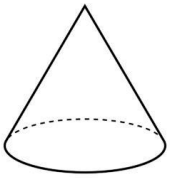
Triangular prism



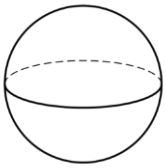
Cylinder



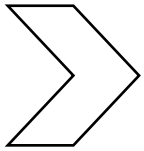
Sphere



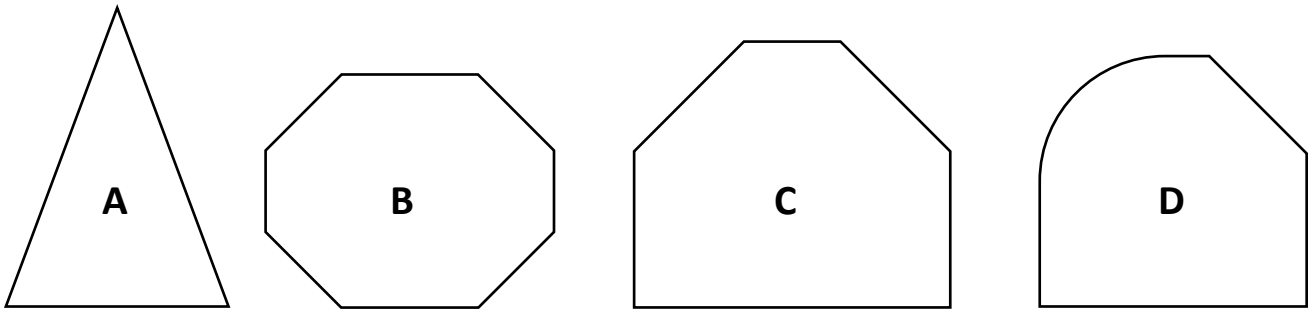
Polygon

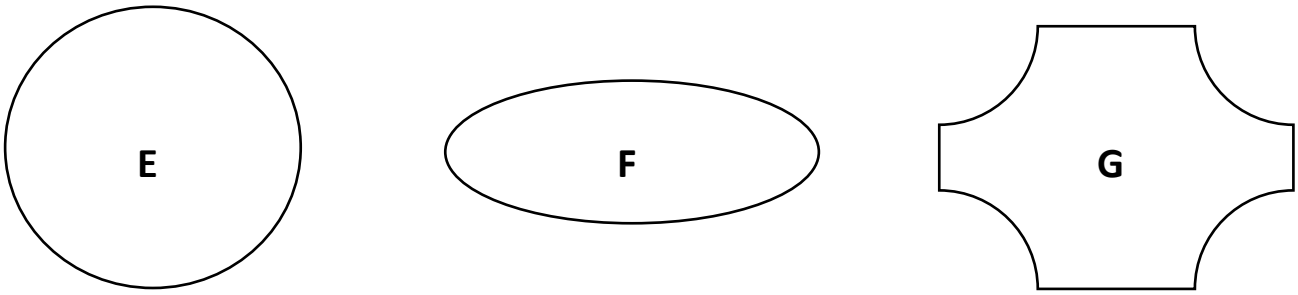


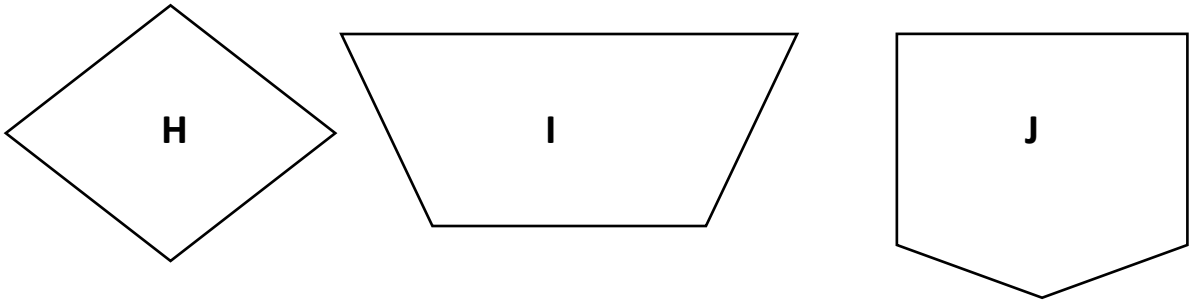
Cube

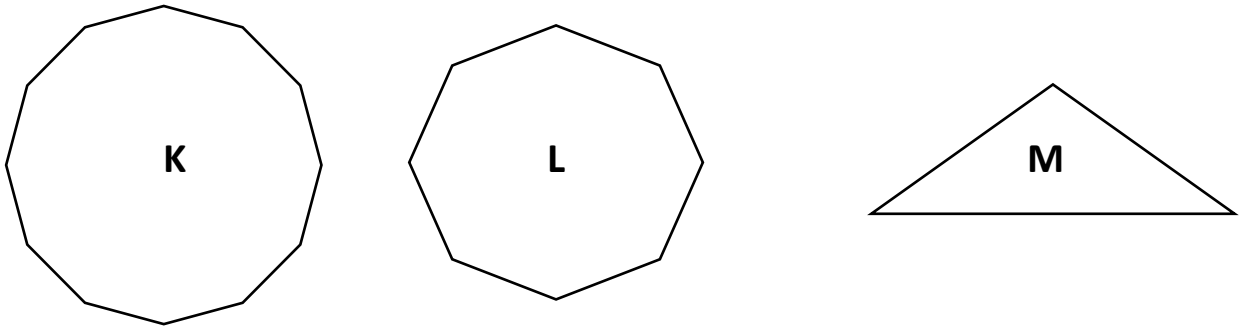


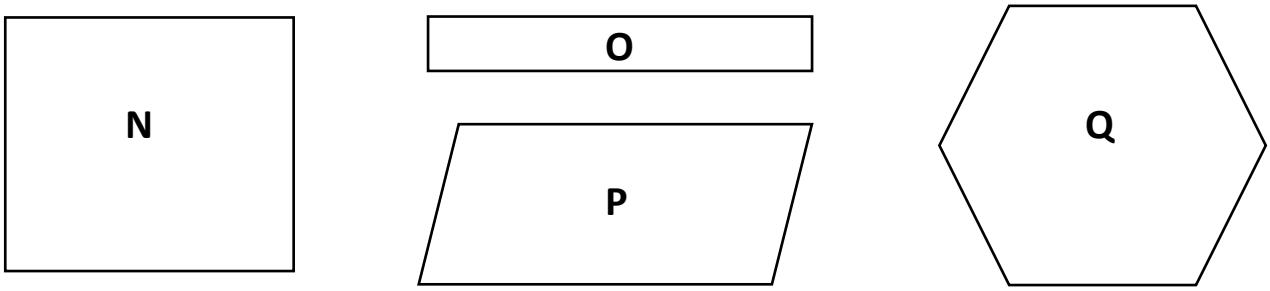
Sorting Shapes











Shape Clues

I have 4 sides. Two of my lines are long, and two of my lines are short. My corners are square. What shape am I?

I have 5 sides. What shape am I?

I am not a polygon. I have no sides. I am the shape of a wheel. What shape am I?

I am a polygon with 3 sides. Two of my sides are equal. What shape am I?

I am a shape of a stop sign. I have 6 vertices. What shape am I?

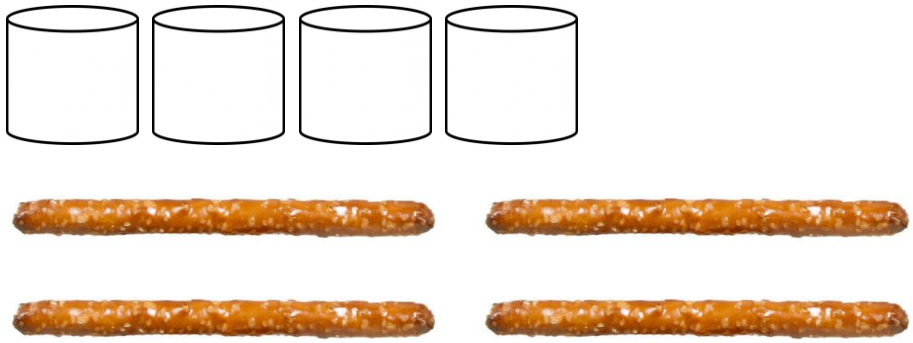
I am a special type of rectangle where all my sides are equal. What shape am I?

I am a polygon with 4 sides and 4 corners, but I'm not a square or a rectangle. What shape am I?

Some people call me a slanted square. Like a square, I have 4 equal sides, but no square corners. What shape am I?

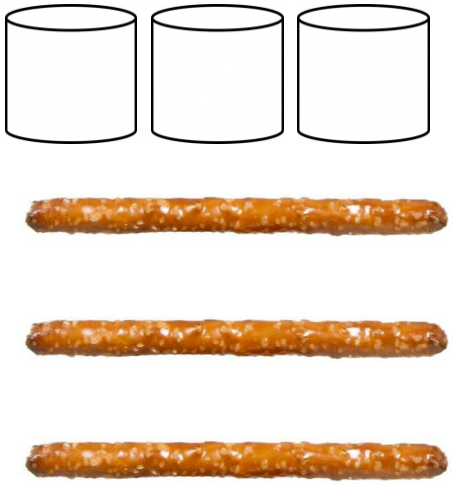
Making Shapes

Use



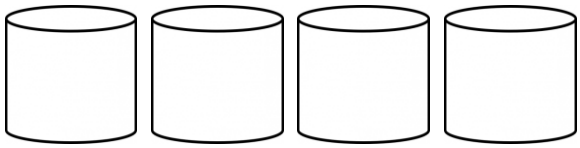
To build a square.

Use



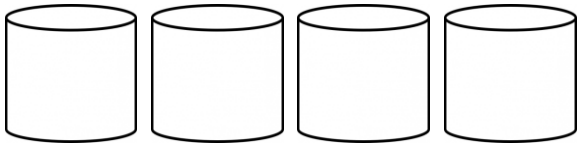
To build a triangle.

Use



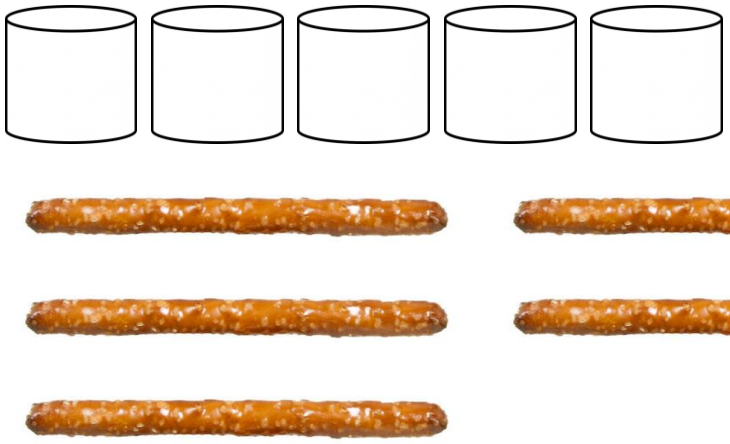
To build a trapezoid.

Use



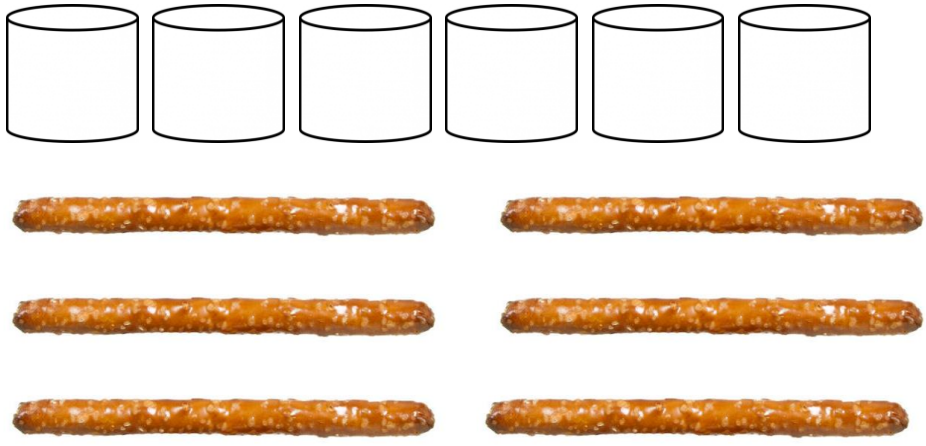
To build a rhombus.

Use



To build a pentagon.

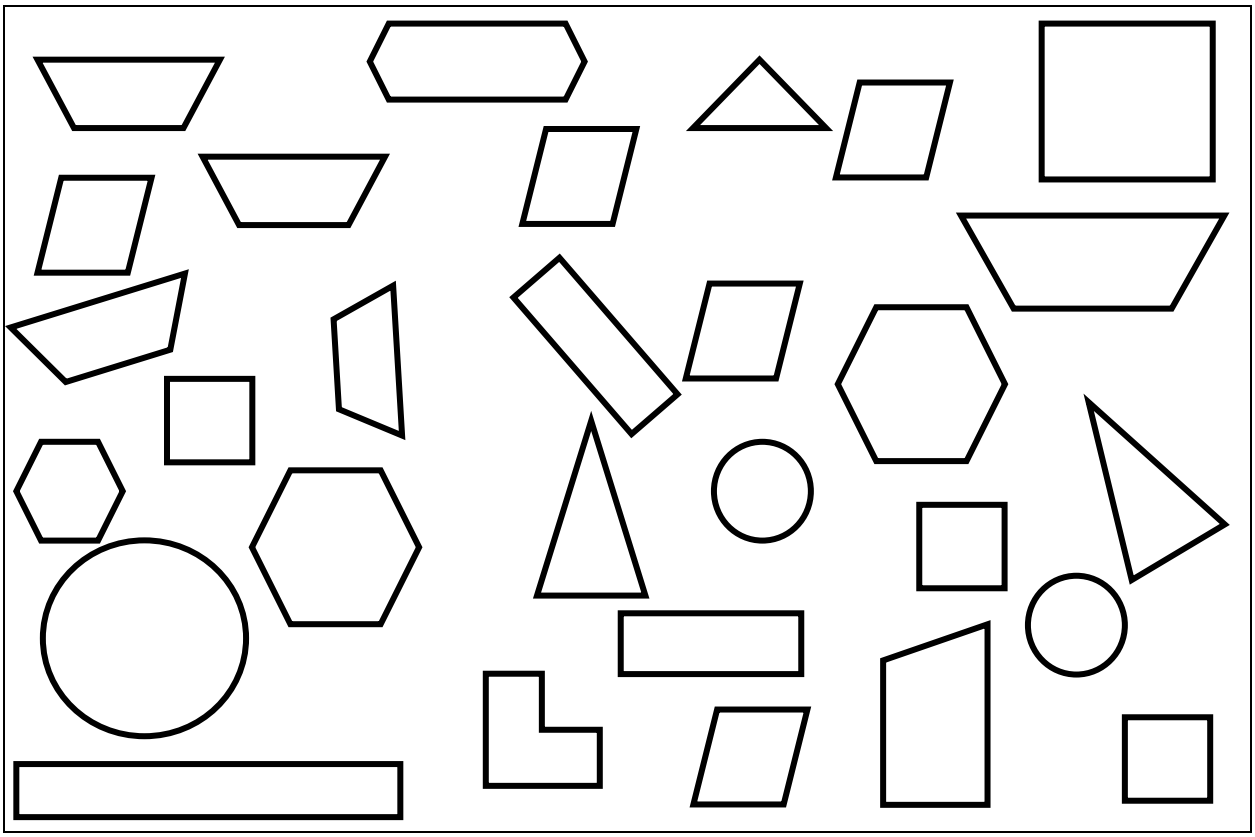
Use



To build a hexagon.

Name: _____

I Spy Shapes



Color the trapezoids green.

Color the squares purple.

Color the rectangles red.

Color the hexagons yellow.

Color the circles blue.

Color the triangles orange.

Color the rhombus black.

I see ___ trapezoids.

I see ___ squares.

I see ___ rectangles.

I see ___ hexagons.

I see ___ circles.

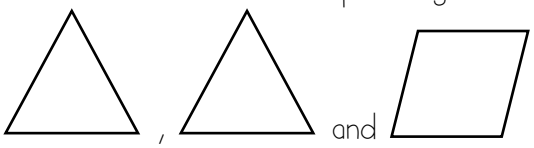
I see ___ triangles.

I see ___ rhombus.

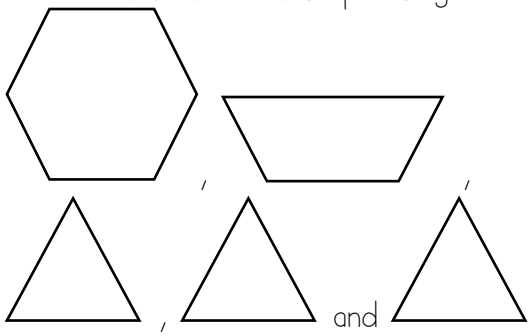
Name: _____

Composing Shapes

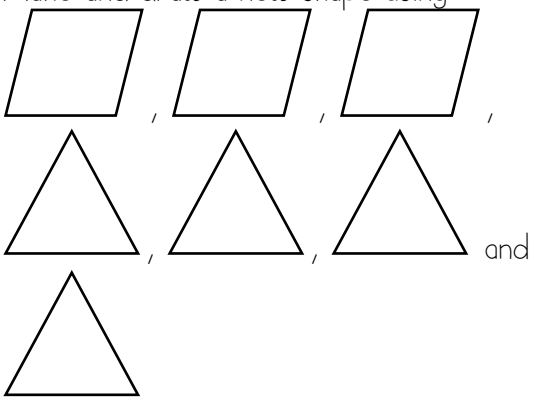
1. Make and draw a new shape using



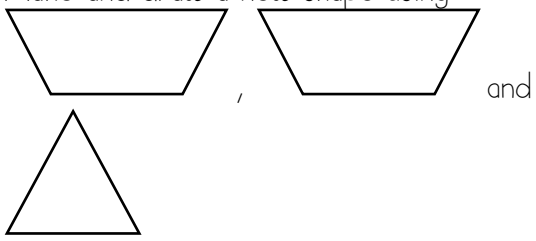
2. Make and draw a new shape using



3. Make and draw a new shape using



4. Make and draw a new shape using



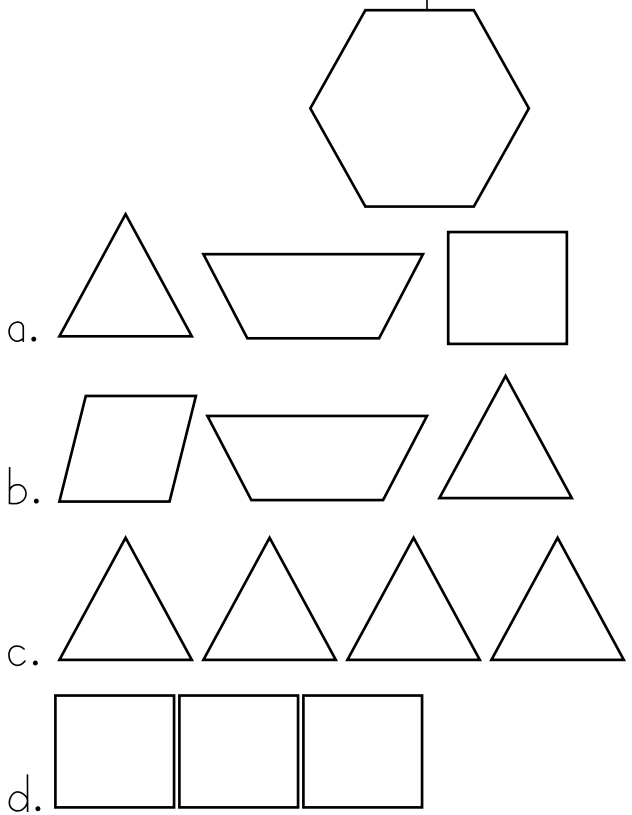
Get creative! Using any of your shape blocks make and draw a new shape. Tell me what the shape is.

I made a _____.

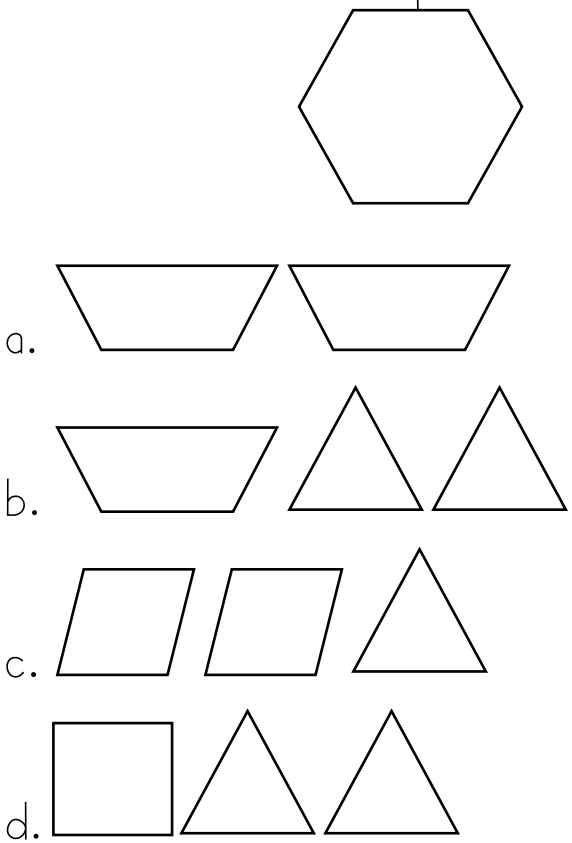
Name: _____

Making Hexagons

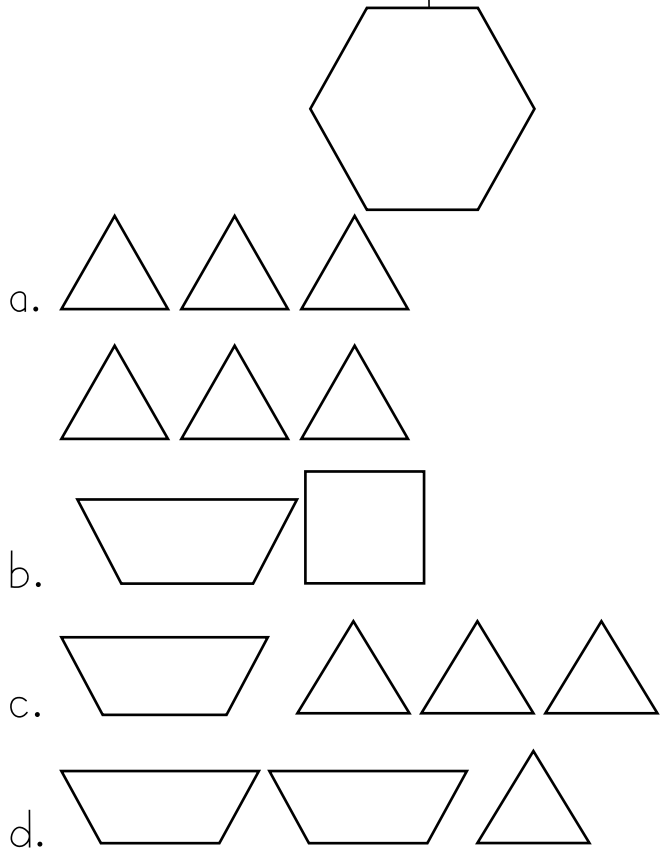
Circle the shapes that make



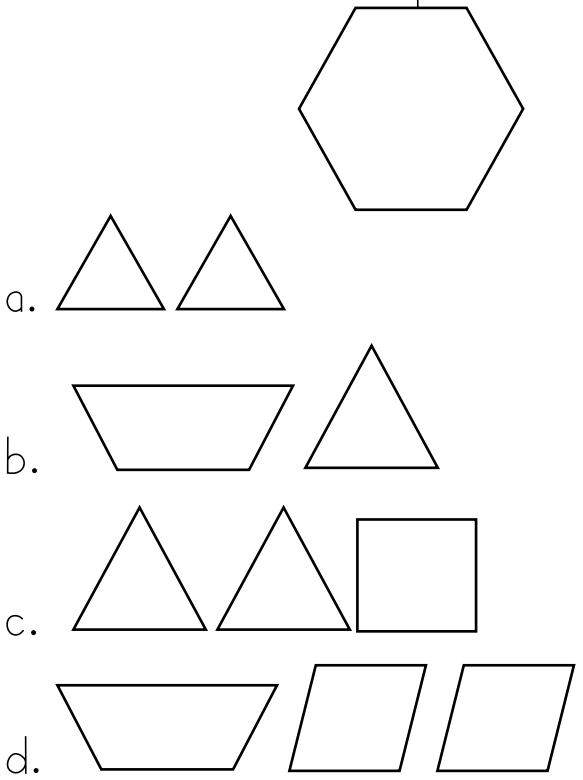
Circle the shapes that make



Circle the shapes that make



Circle the shapes that make



Shapes Performance Task

Materials

3 dice

- Pictures of shapes
- Descriptions of shapes
- 3D shapes

Recording sheet, if using Option 2

Overview of assessment:

Dice 1: Students draw and describe shape using vocabulary

Dice 2: Students draw and name shape with justification

Students list how shapes 1 and 2 are similar or different.

Dice 3: Students draw and describe a real life example of that shape/describe what we use it for.

Option 1: Oral Explanation

Roll dice 1.

What did you roll?

Describe your shape to me.

Keep Dice 1 on table.

Roll Dice 2.

Draw a shape that has these characteristics.

What shape did you draw?

Think about both of your shapes now. How are they alike?

Roll Dice 3.

What did you roll?

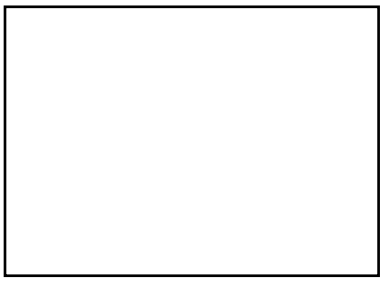
*What does that look like to you? (*optional follow up questions*: How do we use that? Could it be a different shape?)*

Option 2: Recording sheet (with and without wordbank)

Name: _____

I Know My Shapes!

Dice 1:

I rolled this picture 

It is called a _____.

It has _____

and _____.

Dice 2:

I rolled a shape that has _____

and _____.

This shape is called a _____.

I know this because_____

_____.

A _____ and a _____ are

Shape from Dice 1

Shape from Dice 2

similar because they both have _____ and

_____.

Dice 3:

I rolled a _____.

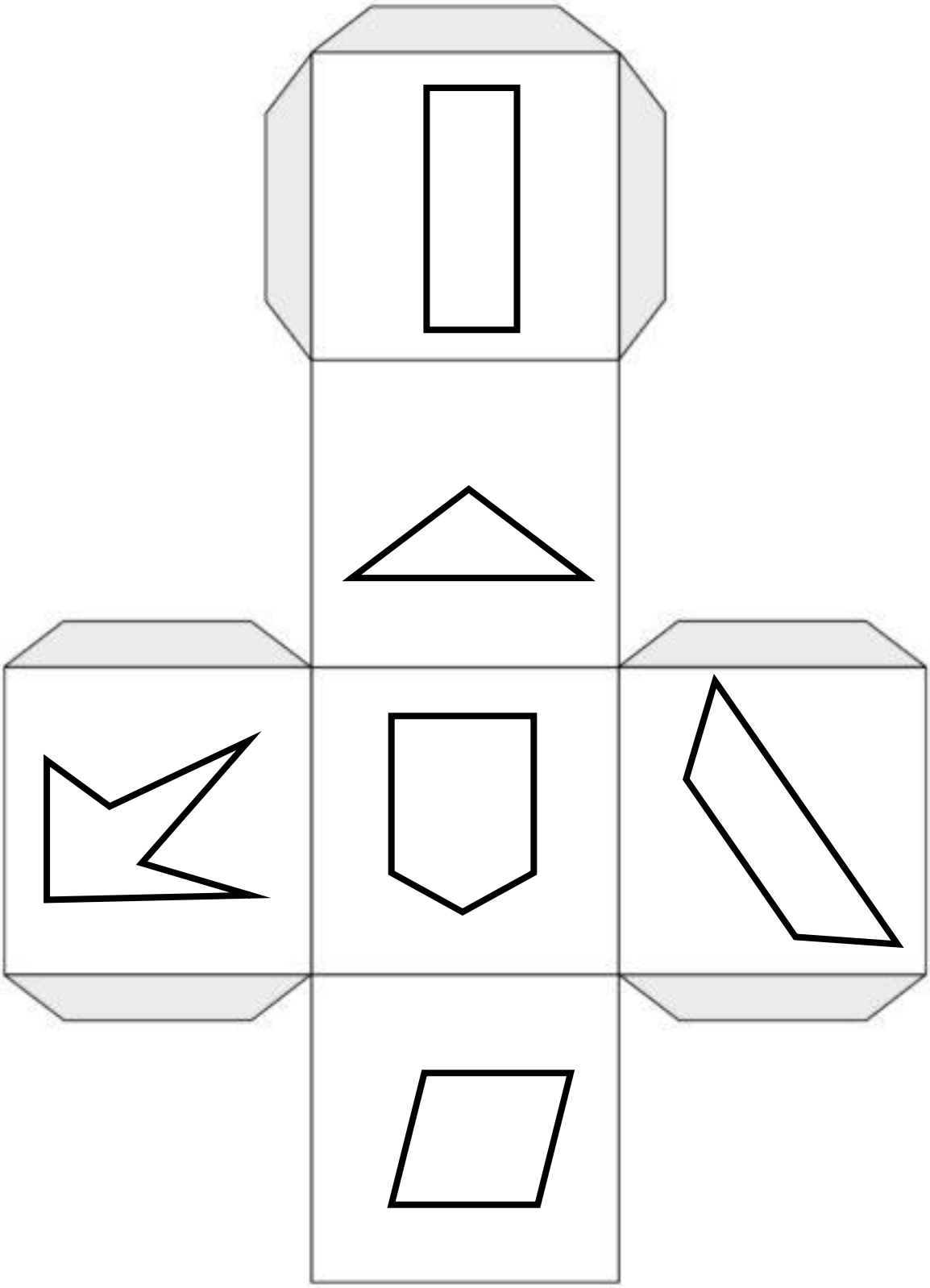
It looks like a _____.

We use that for _____.

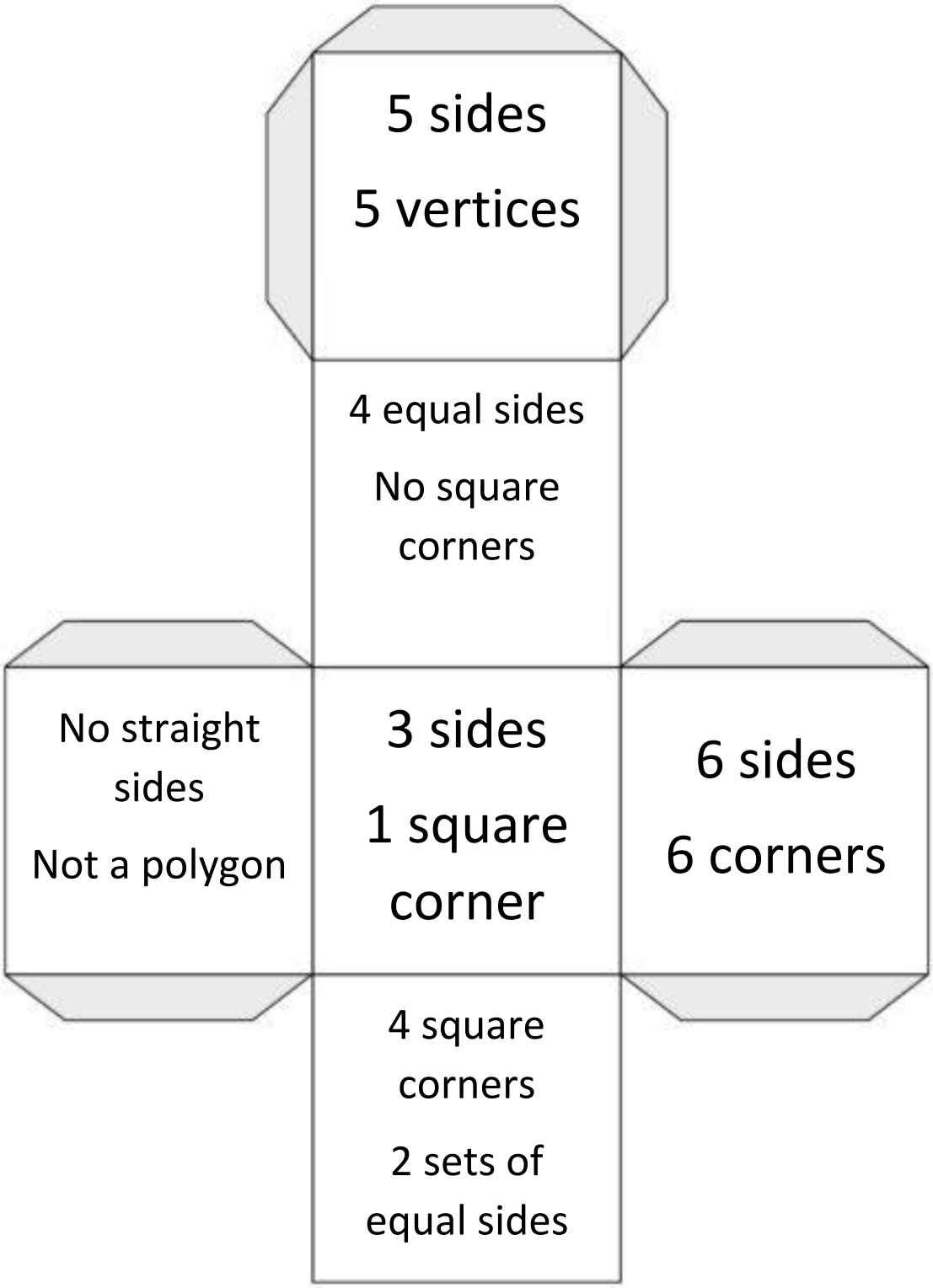
Word bank

Side	Oval	Regular	Cylinder
Sides	Circle	Irregular	Rectangular prism
Corner	Rhombus	Cone	Triangular prism
Vertices	Hexagon	Pyramid	Short
Square	Triangle	Sphere	Long
Rectangle	Trapezoid	Cube	Straight
Curved			

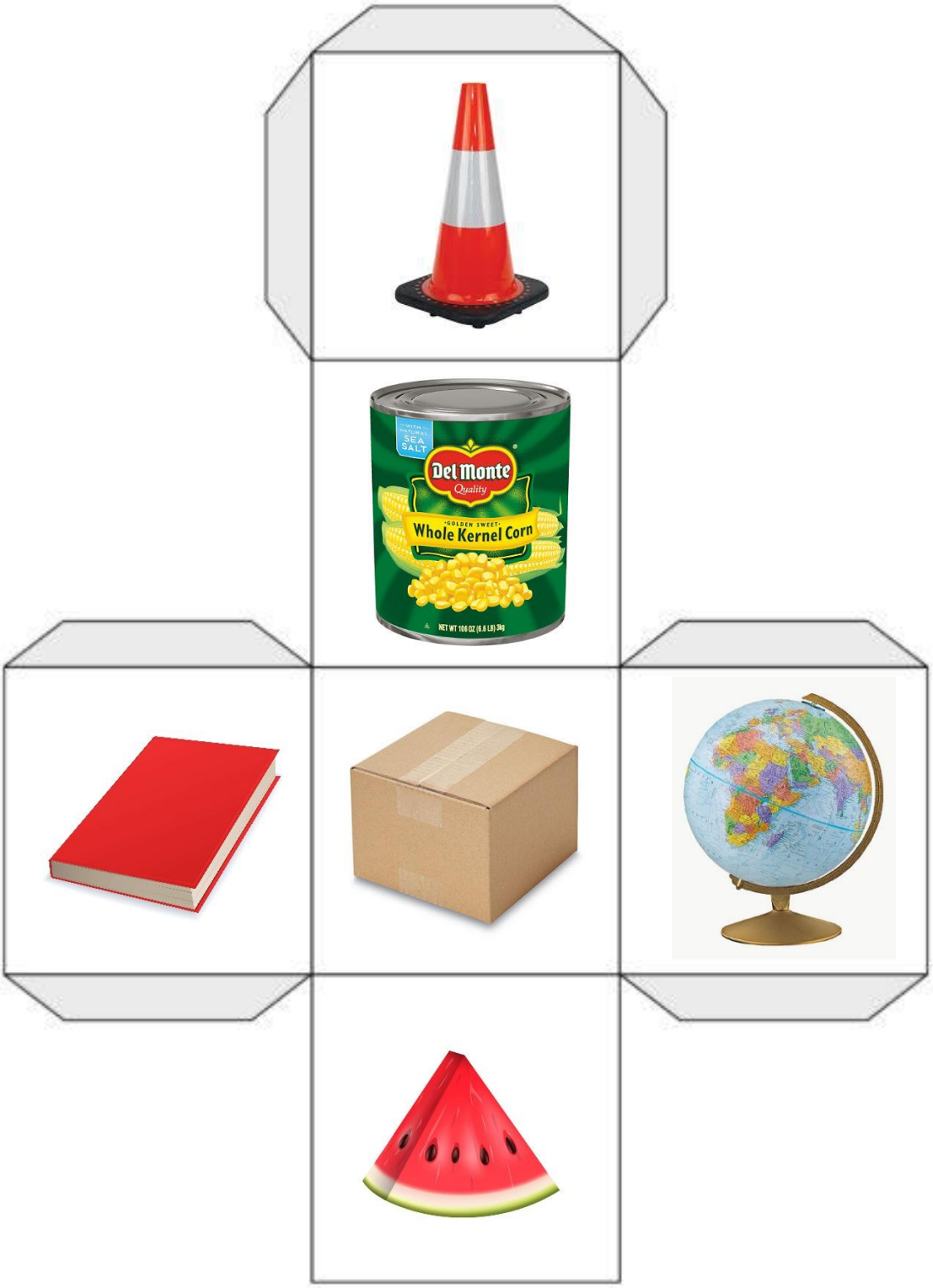
Dice 1



Dice 2


5 sides
5 vertices
4 equal sides
No square corners
No straight sides
Not a polygon
3 sides
1 square corner
6 sides
6 corners
4 square corners
2 sets of equal sides

Dice 3



Shapes Rubric

Goals:	Exceptional	Capable	Developing/ requires support	Requires reteaching/ intervention
I can create and name a shape when I have the characteristics.	Create the regular and irregular forms of the shape	Name the shape and create the correct picture of the shape	Not correctly named shape or drew the wrong shape	Not able to give correct name or picture
I can name and describe the attributes of a shape when I have the picture.	Easily list the shape's name and attributes	List the shape's name and attributes about sides and vertices	Describe attributes that do not describe the shape, are incorrect, or name the wrong shape.	Not able to name shape or describe its attributes.
I can describe how shapes are similar.	Use geometric language to describe how shapes are similar and different	Use geometric language to describe how shapes are similar	Identify some similarities, but is incorrect in other attributes, missing similar attributes, or does not use geometric language to describe similarities	Not able to identify similarities
I can give the name and example of a 3D shape seen in daily life.	Give an example of the shape used in daily life and describe why the shape is used for the purpose	List an example of the shape in daily life and its name	Struggles to list an example of the shape, but can identify the shape	Cannot identify the name or an example of the shape