**Overview:** *The overview statement is intended to provide a summary of major themes in this unit.*

In this unit, students in grade 1 reason about shapes. They distinguish why a given shape belongs to a particular category using their own words. Through careful observation and description, students learn to differentiate between defining attributes (triangles are closed and have three-sides) and non-defining attributes (this particular triangle is large and red). Students share their understanding through the use of drawings, manipulatives, and real world objects and should be given repeated exposure to regular and irregular shapes in order to build and draw shapes that show defining attributes. Manipulation of shapes and spatial exploration are strongly encouraged. Students in grade 1 also compose two- and three-dimensional shapes to create a composite shape, and compose new shapes from the composite shape. Finally, students in grade 1 begin to build a firm foundation of both geometric concepts as well as number relationships. Partitioning shapes and creating fair shares connects to both the part-whole relationship as well as to early fraction concepts. It is important that students in grade 1 are provided with adequate time and experiences to help them reason and develop deep conceptual understanding of the Standards in this Cluster.

**Teacher Notes:** *The information in this component provides additional insights which will help the educator in the planning process for the unit.*

* Review the Progressions for Geometry at: <http://commoncoretools.files.wordpress.com/2012/06/ccss_progression_g_k6_2012_06_27.pdf> to see the development of the understanding of Geometry in Kindergarten stated by the Common Core Standards Writing Team, which is also the guiding information for the PARCC Assessment development.
* When implementing this unit, be sure to incorporate the Enduring Understandings and Essential Questions as the foundation for your instruction, as appropriate.
* Students should engage in well-chosen, purposeful, problem-based tasks. A good mathematics problem can be defined as any task or activity for which the students have no prescribed or memorized rules or methods, nor is there a perception by students that there is a specific correct solution method (Hiebert et al., 1997). A good mathematics problem will have multiple entry points and require students to make sense of the mathematics. It should also foster the development of efficient computations strategies as well as require justifications or explanations for answers and methods.
* Learning about Geometry does not progress in the same way as learning about number, where the size of the number gradually increases and new kinds of numbers are considered later. Instead, students’ reasoning about Geometry develops through five sequential levels in relation to understanding spatial ideas. In order to progress through the levels, instruction must be sequential and intentional. These levels were hypothesized by Pierre van Hiele and Dina van Hiele-Geldof. For more information about the van Hiele Levels of Geometric Thought listed below, please go to: <http://images.rbs.org/cognitive/van_hiele.shtml> or <http://gogeometry.com/mindmap/van_hiele_geometry_level.html>.
* Level 0: Visualization
* Level 1: Analysis
* Level 2: Informal Deduction
* Level 3: Deduction
* Level 4: Rigor
* Attributes refer to any characteristic of a shape.
* Use many real-world examples and non-examples of shapes in order to provide greater depth of understanding as well as to begin noticing them based on similar characteristics and defining attributes. Encourage students to distinguish between defining attributes and non-defining attributes when discussing shapes and the characteristics of shapes.
* When experiencing the properties of shapes kinesthetically, students should be encouraged to participate in free play as well as more directed exploration when composing and decomposing two- and three-dimensional shapes. Allow time for students to test and share their ideas in collaborative groups as they work.
* Through your discussions and interactions with students, emphasize reasoning with shapes and their attributes as emphasized in the Maryland Common Core Standards, as opposed to simply identifying figures, which is typically only a vocabulary exercise.
* Students can learn the correct names of shapes as they are exploring with them. If a student is holding and discussing a *diamond*, you can tell them that this is a called a *rhombus*. Similarly, when they are pointing to or manipulating an *ova*l, you can share with them that this is an *ellipse*.
* Students may describe groups of shapes but may not use conventional classifications in grade 1. By incorporating the Standards for Mathematical Practice into instruction, students will learn to justify and reason why a shape fits into one category but not another.
* When partitioning rectangles and circles into two and four equal shares using the words halves, fourths, and quarters, students should learn these phrases through hands-on exploration. They are being introduced to the idea of fractional parts of the whole (the parts that result when the whole or unit has been partitioned into equal sized portions or fair shares).
* Students develop geometric concepts and spatial reasoning from experience with two perspectives on space: the shapes of objects and the relative positions of objects. Combining the teaching of Geometry with number concepts reinforces the fact that mathematical content is related.
* When allowing students to explore with fair shares, it is important that children are aware that the number of *equa*l parts or *fair* shares that make up the whole determines the name of the shares, in this case halves, fourths, or quarters.
* Introducing the phrase ‘quarter of’ might be confusing to students who have had experiences with money. While money is not formally introduced until grade 2 in the *Maryland* *Common Core State Curriculum*, it is important to note that students who have experience understanding a quarter as representing 25 cents may find this term confusing when learning as ‘a quarter of’ as meaning a fourth of. Therefore, there should be careful and clear explanation to students. It is important to show that circles and rectangles can be divided into four equal parts, shares, or quarters just as a dollar represents the whole and equals four quarters. Students need to understand that thinking that the phrase ‘quarter of’ is 25 of the whole is incorrect.

**Enduring Understandings:** *Enduring understandings**go beyond discrete facts or skills. They focus on larger concepts, principles, or processes. They are transferable and apply to new situations within or beyond the subject.*

* Geometry helps us understand the structure of space and the spatial relations around us.
* Through geometry we can analyze the characteristics and properties of two- and three-dimensional shapes, as well as develop mathematical arguments concerning geometric relationships.
* Geometry helps us develop and use rules for two- and three-dimensional shapes.

**Essential Questions:** *A question is essential when it stimulates multi-layered inquiry, provokes deep thought and lively discussion, requires students to consider alternatives and justify their reasoning, encourages re-thinking of big ideas, makes meaningful connections with prior learning, and provides students with opportunities to apply problem-solving skills to authentic situations.*

* Where in the real world can I find shapes?
* How can objects be represented and compared using geometric attributes?
* How can I put shapes together and take them apart to form other shapes?
* How can I identify and describe solid figures?
* How can I compare and contrast two- and three-dimensional shapes?

**Content Emphasis by Cluster in Grade 1:** *According to the Partnership for the Assessment of Readiness for College and Careers (PARCC), some clusters require greater emphasis than others. The table below shows PARCC’s relative emphasis for each cluster. Prioritization does not imply neglect or exclusion of material. Clear priorities are intended to ensure that the relative importance of content is properly attended to. Note that the prioritization is in terms of cluster headings.*

**Key:**

* ***Major Clusters***
* ***Supporting Clusters***
* ***Additional Clusters***

Operations and Algebraic Thinking

* Represent and solve problems involving addition and subtraction.
* Understand and apply properties of operations and the relationship between addition and subtraction.
* Add and subtract within 20.
* Work with addition and subtraction equations.

Number and Operations in Base Ten

* Extend the counting sequence.
* Understand place value.
* Use place value understanding and properties of operations to add and subtract.

Measurement and Data

* Measure lengths indirectly and by iterating length units.
* Tell time and write time
* Represent and interpret data.

Geometry

* ***Reason with shapes and their attributes.***

**Focus Standards:** *(Listed as Examples of Opportunities for In-Depth Focus in the PARCC Content Framework documents for Grades 3-8)*

*According to the Partnership for the Assessment of Readiness for College and Careers (PARCC), this component highlights some individual standards that play an important role in the content of this unit. Educators from the State of Maryland have identified the following Standards as Focus Standards. Should PARCC release this information for Prekindergarten through Grade 2, this section would be updated to align with their list. Educators may choose to give the indicated mathematics an especially in-depth treatment, as measured for example by the number of days; the quality of classroom activities for exploration and reasoning, the amount of student practice, and the rigor of expectations for depth of understanding or mastery of skills.*

* **1.G.A.3** Partition circles and rectangles into two and four equal shares, describe the shares using the words *halves*, *fourths*, and *quarters*, and use the phrases *half of*, *fourth of*, and *quarter of*. Describe the whole as two of, or four of the shares. Understand for these examples that decomposing into more equal shares creates smaller shares.

**Possible Student Outcomes:** *The following list provides outcomes that describe the knowledge and skills that students should understand and be able to do when the unit is completed. The outcomes are often components of more broadly-worded standards and sometimes address knowledge and skills necessarily related to the standards. The lists of outcomes are not exhaustive, and the outcomes should not supplant the standards themselves. Rather, they are designed to help teachers delve deeply into the standards and augment as necessary, providing added focus and clarity for lesson planning purposes. This list is not intended to imply any particular scope or sequence.*

The student will:

* Have the opportunity to become engaged in problem solving that is about thinking and reasoning.
* Collaborate with peers in an environment that encourages student interaction and conversation that will lead to mathematical discourse.
* Describe in their own words why a shape belongs to a given category.
* Use reasoning to differentiate between geometrically defining attributes (e.g., triangles have three sides) and non-defining attributes e.g., (color, overall size, or orientation).
* Compose two-dimensional shapes (rectangles, squares, trapezoids, triangles, half-circles, and quarter-circles) or three-dimensional shapes (cubes, right rectangular prisms, right circular cones, and right circular prisms) to create a composite shape. Students do not need to learn formal names such as ‘*right rectangular prism*.’
* Compose new shapes from composite shapes they have composed.
* Partition circles and rectangles into two and four equal shares.
* Describe the shares they partition using the words ‘halves’, ‘fourths’, and ‘quarters’, and use the phrases ‘half of’, ‘fourth of’, and ‘quarter of’.
* Describe the whole as two of, or four of the shares and understand that for these examples decomposing into more equal shares creates smaller shares.
* Become engaged in problem solving that is about thinking and reasoning.
* Collaborate with peers in an environment that encourages student interaction and conversation that will lead to mathematical discourse about geometry.

**Progressions from Common Core State Standards in Mathematics:** *For an in-depth discussion of the overarching, “big picture” perspective on student learning of content related to this unit, see:*

* The Progressions for Geometry at: <http://commoncoretools.files.wordpress.com/2012/06/ccss_progression_g_k6_2012_06_27.pdf> stated by the Common Core Standards Writing Team, which is also the guiding information for the PARCC Assessment development.

**Vertical Alignment:** *Vertical curriculum alignment provides two pieces of information: (1) a description of prior learning that should support the learning of the concepts in this unit, and (2) a description of how the concepts studied in this unit will support the learning of additional mathematics.*

* **Key Advances from Previous Grades:**

Students in Prekindergarten:

* Match like (congruent and similar) shapes.
* Group shapes by attributes.
* Correctly name shapes (regardless of their orientations or overall size).

Students in Kindergarten:

* 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.*
* Correctly name shapes regardless of their orientations or overall size.
* Identify shapes as two-dimensional (lying in a plane, “flat”) or three-dimensional (“solid”).
* Analyze and compare two- and three-dimensional shapes, in different sizes and orientations, using informal language to describe their similarities, differences, parts and other attributes.
* Model shapes in the world by building shapes from components and drawing shapes.
* Compose simple shapes to form larger shapes.
* **Additional Mathematics:**

In grade 2, students:

* Recognize and draw shapes having specified attributes, such as a given number of angles or a given number of equal faces.
* Identify triangles, quadrilaterals, pentagons, hexagons, and cubes.
* Partition a rectangle into rows and columns of same-size squares and count to find the total number of them.
* Partition circles and rectangles into two, three, or four equal shares.
* Describe shares using the words *halves*, *thirds*, *half of*, *a third of*, etc. and describe the whole as two halves, three thirds, four fourths.
* Recognize that equal shares of identical wholes need not have the same shape.

In grade 3, students:

* Understand concepts of area and relate area to multiplication and to addition.
* Recognize perimeter as an attribute of plane figures and distinguish between linear and area measures.
* Understand that shapes in different categories may share attributes and that the shared attributes can define a larger category.
* Recognize rhombuses, rectangles, and squares as examples of quadrilaterals, and draw examples of quadrilaterals that do not belong to any of these subcategories.
* Partition shapes into parts with equal areas. Express the area of each part as a unit fraction of the whole.

In Grades 4 and beyond, students:

* Draw and identify lines and angles, and classify shapes by properties of their lines and angles.
* Graph points on the coordinate plane to solve real-world and mathematical problems.
* Classify two-dimensional figures into categories based on their properties.
* Solve real-world and mathematical problems involving area, surface area, and volume.
* Draw, construct, and describe geometrical figures and describe the relationships between them.
* Solve real-life and mathematical problems involving angle measure, are, surface area, and volume.
* Understand congruence and similarity using physical models, transparencies, or geometry software.

**Possible Organization of Unit Standards:** *This table identifies additional grade-level standards within a given cluster that support the over-arching unit standards from within the same cluster. The table also provides instructional connections to grade-level standards from outside the cluster.*

|  |  |  |
| --- | --- | --- |
| **Over-Arching**  **Standards** | **Supporting Standards**  **within the Cluster** | **Instructional Connections outside the Cluster** |
| **1.G.A.1** Distinguish between defining attributes (e.g., triangles are closed and three-sided) versus non-defining attributes (e.g., color, orientation, overall size); build and draw shapes to possess defining attributes. |  |  |
| **1.G.A.2** Compose two-dimensional shapes (rectangles, squares, trapezoids, triangles, half-circles, and quarter-circles) or three-dimensional shapes (cubes, right rectangular prisms, right circular cones, and right circular  cylinders) to create a composite shape, and compose new shapes from the composite shape. |  | **1.MD.A.1.** Order three objects by length; compare the lengths of two objects indirectly by using a third object. |
| **1.G.A.3**  Partition circles and rectangles into two and four equal shares, describe the shares using the words *halves*, *fourths*, and *quarters*, and use the phrases *half of*, *fourth of*, and *quarter of*. Describe the whole as two of,  or four of the shares. Understand for these examples that decomposing into more equal shares creates smaller shares. |  | **1.MD.B.3.** Tell and write time in hours and half-hours using analog and digital clocks. |

**Connections to the Standards for Mathematical Practice:** *This section provides examples of learning experiences for this unit that support the development of the proficiencies described in the Standards for Mathematical Practice. These proficiencies correspond to those developed through the Literacy Standards. The statements provided offer a few examples of connections between the Standards for Mathematical Practice and the Content Standards of this unit. The list is not exhaustive and will hopefully prompt further reflection and discussion.*

***In this unit, educators should consider implementing learning experiences which provide opportunities for students to:***

1. **Make sense of problems and persevere in solving them.**
   1. Determine what the problem is asking for: common attribute of several shapes, shape composed of two other shapes, division of a shape into halves, fourths.
   2. Determine whether concrete or virtual models, pictures, mental mathematics, or equations are the best tools for solving the problem.
   3. Check the solution with the problem to verify that it does answer the question asked.
2. **Reason abstractly and quantitatively**
   1. Compare the shapes and discuss how they are alike and different
   2. Use defining attributes of shapes to discuss their similarities and differences.
3. **Construct Viable Arguments and critique the reasoning of others.**
   1. Compare the models used by others with yours.
   2. Examine the steps taken that produce an incorrect response and provide a viable argument as to why the process produced an incorrect response.
   3. Use the calculator to verify the correct solution, when appropriate.
4. **Model with Mathematics**
   1. Construct visual models using concrete or virtual manipulatives, or pictures to justify thinking and display the solution
5. **Use appropriate tools strategically**
   1. Use pattern blocks, attribute blocks, Geoboards, connecting cubes, sorting blocks, foam or wooden geometric shapes, geosolids, folding solids, polydrons, pattern blocks, color tiles, Cuisenaire rods, die, paper and pencil, and objects in the real world, or other models, as appropriate.
6. **Attend to precision**
   1. Use mathematics vocabulary such as rectangle, square, trapezoid, triangle, half-circle, quarter-circle, cubes, cons, prism, halves, fourths, quarters, etc. properly when discussing problems.
   2. Demonstrate understanding of the mathematical processes required to solve a problem by carefully showing all of the steps in the solving process.
   3. Correctly write and read equations.
   4. Use <, =, and > appropriately to compare expressions.
7. **Look for and make use of structure.**
8. Use the patterns seen in different shapes to make comparisons.
9. Use the relationships demonstrated in the defining attributes to explain similarities and differences.
10. **Look for and express regularity in reasoning**
    1. Use the patterns illustrated when dividing a shape into equal parts to make sense of halves, fourths, and quarters.
    2. Use the relationships demonstrated between shapes to make comparisons.

**Content Standards with Essential Skills and Knowledge Statements and Clarifications:** *The Content Standards and Essential Skills and Knowledge statements shown in this section come directly from the Maryland State Common Core Curriculum Frameworks. Clarifications were added as needed. Educators should be cautioned against perceiving this as a checklist. All information added is intended to help the reader gain a better understanding of the standards.*

| **Standard** | **Essential Skills and Knowledge** | **Clarification** |
| --- | --- | --- |
| **1.G.A.1** Distinguish between defining attributes (e.g., triangles are closed and three-sided) versus non-defining attributes (e.g., color, orientation, overall size); build and draw shapes to possess defining attributes. | ***Essential Skills and Knowledge***  • ***Ability to sort shapes (e.g., attribute blocks, polygon figures) by shape, number of sides, size or number of angles***  • ***Ability to use geoboards, toothpicks, straws, paper and pencil, computer games to build shapes that possess the defining attributes***  • ***Ability to explain how two shapes are alike or how they are different from each other*** | * Students use attribute language to describe a given two-dimensional shape: number of sides, number of vertices/points, straight sides, closed. A child might describe a square as “tilted sideways” or “big.” These attributes are not defining because they are irrelevant to whether a shape is a square or not. * Students should articulate ideas such as, “A square is a square because it has four straight sides, four corners (or right angles), and is closed.” In later grades, students will explore shapes in more depth, and will eventually lead to understanding that a square is a parallelogram with four *equal* sides whose diagonals cross at right angles; it is also a convex quadrilateral. * It is important that students are exposed to both regular and irregular shapes so that they can communicate defining attributes. Students should use attribute language to describe why these shapes are not squares.      * Example: During a shape sorting activity with attribute blocks, a student might say, “this shape has to go with the triangles, because it has three sides, and there are three corners. It doesn’t matter which way it’s turned or how big or small it is.”   attblocks.jpg |
| **1.G.A.2** Compose two-dimensional shapes (rectangles, squares, trapezoids, triangles, half-circles, and quarter-circles) or three-dimensional shapes (cubes, right rectangular prisms, right circular cones, and right circular  cylinders) to create a composite shape, and compose new shapes from the composite shape. | ***Essential Skills and Knowledge***  • ***Ability to use concrete manipulatives (e.g., pattern blocks, attribute blocks, cubes, rectangular prisms, cones, cylinders, geoboards, paper & pencil,) to create composite shapes from 2 or 3 dimensional shapes*** | It is important for students in grade 1 to develop the ability to describe, use and visualize the effect of composing and decomposing shapes. They should begin to see that there is a mathematical connection between the ability to compose and decompose shapes and the ability to compose and decompose numbers.  Students may use pattern blocks, plastic shapes, tangrams, clay, large wooden blocks, cutouts of shapes, or technology to make new shapes. They should combine these shapes to make new shapes.  Examples:  1.    From: <http://commoncoretools.files.wordpress.com/2012/06/ccss_progression_g_k6_2012_06_27.pdf>  2.    3. *(Continued on next page.)*    In grade 1, students learn to perceive a combination of shapes as a single new shape (e.g., recognizing that two isosceles triangles can be combined to make a rhombus, and simultaneously seeing the rhombus and the two triangles). Thus, they develop competencies that include solving shape puzzles, constructing designs with shapes, and creating and maintaining a shape as a unit. |
| **1.G.A.3**  Partition circles and rectangles into two and four equal shares, describe the shares using the words *halves*, *fourths*, and *quarters*, and use the phrases *half of*, *fourth of*, and *quarter of*. Describe the whole as two of,  or four of the shares. Understand for these examples that decomposing into more equal shares creates smaller shares. | ***Essential Skills and Knowledge***  • ***Knowledge that the whole or unit has been partitioned into equal–sized portions or fair shares***  • ***Ability to apply the concept of sharing equally with friends lays the foundation for fractional understanding.***  • ***Ability to model halves and fourths with concrete materials*** | Sharing tasks can and should be posed in the form of simple story problems that allow students to think of sharing pieces fairly. The level of difficulty of the problem can be determined by the relationship between the number of things to be shared and the number of sharers.  If students have only ever divided up circles (pizza) they may think this is the only way to divide shapes up. Using many different sized squares or rectangles which can be cut in many different ways will help students recognize or square recognize that when they cut something into two equal pieces, each piece will equal one half of its original whole.  Example:    It is important for students to recognize that halves of two different wholes are not necessarily the same size. Also they should reason that decomposing equal shares into more equal shares results in smaller equal shares.  *(Continued on next page.)*    From: <http://www.ncpublicschools.org/docs/acre/standards/common-core-tools/unpacking/math/1st.pdf> |

**Evidence of Student Learning:** *The Partnership for the Assessment of Readiness for College and Careers (PARCC) has awarded the Dana Center a grant to develop the information for this component. This information will be provided at a later date. The Dana Center, located at the University of Texas in Austin, encourages high academic standards in mathematics by working in partnership with local, state, and national education entities.  Educators at the Center collaborate with their partners to help school systems nurture students' intellectual passions.  The Center advocates for every student leaving school prepared for success in postsecondary education and in the contemporary workplace.*

**Fluency Expectations and Examples of Culminating Standards:** *This section highlights individual standards that set expectations for fluency, or that otherwise represent culminating masteries. These standards highlight the need to provide sufficient supports and opportunities for practice to help students meet these expectations. Fluency is not meant to come at the expense of understanding, but is an outcome of a progression of learning and sufficient thoughtful practice. It is important to provide the conceptual building blocks that develop understanding in tandem with skill along the way to fluency; the roots of this conceptual understanding often extend one or more grades earlier in the standards than the grade when fluency is finally expected.*

* There are no fluency expectations relating to Geometry in grade 1.The fluency expectation for grade 1 is to add and subtract within 10.

**Common Misconceptions:** *This list includes general misunderstandings and issues that frequently hinder student mastery of concepts regarding the content of this unit.*

* Confusing terms that relate to money, such as “a quarter of” with parts of a whole. For example, a student thinks “a quarter of” a rectangle is 25 pieces of the rectangle.
* Not realizing that when sharing parts of a whole, the pieces must be equal in order for it to be a “fair share”.
* Thinking that if the position of the shape changes, the name of the shape changes.
* Not realizing that a square is a special kind of rectangle, or that a square is also a parallelogram and a rhombus. Experiences with noticing the characteristics of shapes should be encouraged through play and guided exploration.
* Incorrectly identifying a sphere as a *circle* or a cube as a *square*. Experiences which allow students to explore the characteristics of two- and three-dimensional shapes should be encouraged.
* Categorizing two-dimensional shapes incorrectly. This could be due to the orientation of the shape or due to over generalizing from incorrect examples.
* The inability to create both regular and irregular polygons.

**Interdisciplinary Connections:** *Interdisciplinary connections fall into a number of related categories:*

* *Literacy standards within the Maryland Common Core State Curriculum*
* *Science, Technology, Engineering, and Mathematics standards*
* *Instructional connections to mathematics that will be established by local school systems, and will reflect their specific grade-level coursework in other content areas, such as English language arts, reading, science, social studies, world languages, physical education, and fine arts, among others.*

|  |  |  |
| --- | --- | --- |
| **Available Model Lesson Plan(s)** | | |
| The lesson plan(s) have been written with specific standards in mind.  Each model lesson plan is only a MODEL – one way the lesson could be developed.  We have NOT included any references to the timing associated with delivering this model.  Each teacher will need to make decisions related to the timing of the lesson plan based on the learning needs of students in the class. The model lesson plans are designed to generate evidence of student understanding.  This chart indicates one or more lesson plans which have been developed for this unit. Lesson plans are being written and posted on the Curriculum Management System as they are completed. Please check back periodically for additional postings. | | |
| **Standards Addressed** | **Title** | **Description/Suggested Use** |
| 1.G.A.2 | Exploring Two- and Three-Dimensional Shapes & Their Properties | Students learn the names and explore the characteristics of solid shapes. They recognize 3-dimensional geometric shapes in the real world and recognize shapes when they are combined with other shapes. |

|  |  |  |
| --- | --- | --- |
| **Available Lesson Seeds** | | |
| The lesson seed(s) have been written with specific standards in mind.  These suggested activity/activities are not intended to be prescriptive, exhaustive, or sequential; they simply demonstrate how specific content can be used to help students learn the skills described in the standards. Seeds are designed to give teachers ideas for developing their own activities in order to generate evidence of student understanding.  This chart indicates one or more lesson seeds which have been developed for this unit. Lesson seeds are being written and posted on the Curriculum Management System as they are completed. Please check back periodically for additional postings. | | |
| **Standards Addressed** | **Title** | **Description/Suggested Use** |
| 1.G.A.3 | Equal Shares | Students partition circles and rectangles into two and four equal shares to learn about halves, fourths, and quarters. |
|  |  |  |

**Sample Assessment Items:** *The items included in this component will be aligned to the standards in the unit and will include:*

* + *Items purchased from vendors*
  + *PARCC prototype items*
  + *PARCC public released items*
  + *Maryland Public release items*
  + *Formative Assessment*

|  |  |  |  |
| --- | --- | --- | --- |
| **Topic** | **Standards Addressed** | **Link** | **Notes** |
| 3-D Shape Sort | 1,G,A,1 | <http://www.illustrativemathematics.org/illustrations/1104> | The purpose of this task is to familiarize students with the idea of defining and non-defining attributes of geometric figures. If it is difficult to put together a collection of real objects, the teacher may need to prepare a set of cards with pictures of objects. For example, sphere cards can include a basketball, baseball, globe, and orange. The cylinder cards can include a juice glass, food can, and toilet paper roll. Pictures of classroom items are a great idea as well (trash can - cylinder, white board eraser - rectangular prism, etc.).  This task can be extended by having students go on a scavenger hunt around the classroom or school. They take photographs of items to include in this 3-D Shape Sort. |
| Only Some | 1.G.A.1 | <http://www.illustrativemathematics.org/illustrations/752> | The purpose of this task is for students to discuss and come to understand what constitute defining attributes for triangles, squares, and rectangles. Students start by looking for attributes shared by all the instances of a particular shape. Some, but not, all of these attributes will be defining attributes. For example, all rectangles have opposite sides parallel, but this isn't a defining attribute--it is something you can show starting only with the defining attributes that a rectangle is a quadrilateral with four right angles. Thus, in the end the teacher will need to state for the students which of those attributes are defining attributes by helping the class write a definition for each shape. |
| Counting Squares | 1.G.A.2 | <http://www.illustrativemathematics.org/illustrations/1164> | This task is intended to be a simpler form of 1.G.A.2 Overlapping Rectangles. The purpose of this task is to give students an opportunity to compose and decompose squares. This is a challenging problem for first graders and it would be inappropriate to use it as an assessment. However, if presented as a brainteaser it can be useful for giving the students practice in recognizing squares, and stimulate interest as students compete to try to find the most squares. Furthermore, older students may also benefit from such an exercise as well, which could be aligned with 2.G.1. |
| Grandfather Tang’s Story | 1.G.A.2 | <http://www.illustrativemathematics.org/illustrations/1311> | The purpose of this task is for students to compose two-dimensional shapes to create a composite shape using the 7 tangram pieces. It is essential that the language the teacher uses during the task is precise to support students' academic vocabulary development. For example, "turn the square so one side is lined up with the shorter side of the rhombus to create the tail of the squirrel." |
| Make Your Own Puzzle | 1.G.A.2 | <http://www.illustrativemathematics.org/illustrations/756> | The purpose of this task is to give students a hands-on experience with composing and decomposing geometric figures and is meant as an instructional task. While the standard suggests particular figures, students should not be limited to the ones listed in the standard. Students will definitely benefit from this type of activity before they are asked to make more formal arguments related to composing and decomposing shapes in later grades. This task would also be appropriate for advanced kindergarten students (see K.G.6). |
| Overlapping Rectangles | 1.G.A.2 | <http://www.illustrativemathematics.org/illustrations/901> | The purpose of this task is to give students an opportunity to compose and decompose polygons to make rectangles. This is a challenging problem for first graders and it would be inappropriate to use it as an assessment. However, if presented as a brainteaser it can be useful for giving the students practice in recognizing rectangles, and stimulate interest as students compete to try to find the most rectangles. Furthermore, older students may also benefit from such an exercise as well, which could be aligned with 2.G.1 or even 3.G.1. |

**Interventions/Enrichments:** *(Standard-specific modules that focus on student interventions/enrichments and on professional development for teachers will be included later, as available from the vendor(s) producing the modules.)*

**Vocabulary/Terminology/Concepts:** *This section of the Unit Plan is divided into two parts. Part I contains vocabulary and terminology from standards that comprise the cluster which is the focus of this unit plan. Part II contains vocabulary and terminology from standards outside of the focus cluster. These “outside standards” provide important instructional connections to the focus cluster.*

***Part I – Focus Cluster:***

*(There are no specific vocabulary terms highlighted in the Framework. However, focus should be given to the following: rectangle, square, trapezoid, half-circle, quarter circle, cube, prism, cone, cylinder, halves, fourths, and quarters so that students can use these word when discussing their thinking.)*

***Part II – Instructional Connections outside the Focus Cluster***

*(No additional vocabulary words are included in other clusters related to this topic.)*

**Resources:**

**Free Resources:**

* <http://wps.ablongman.com/ab_vandewalle_math_6/0,12312,3547876-,00.html> Reproducible blackline masters
* <http://lrt.ednet.ns.ca/PD/BLM_Ess11/table_of_contents.htm> mathematics blackline masters
* <http://yourtherapysource.com/freestuff.html> Simple activities to encourage physical activity in the classroom
* <http://www.mathsolutions.com/index.cfm?page=wp9&crid=56> Free lesson plan ideas for different grade levels
* <http://sci.tamucc.edu/~eyoung/literature.html> links to mathematics-related children’s literature
* <http://www.nctm.org/> National Council of Teachers of Mathematics
* [www.k-5mathteachingresources.com](http://www.k-5mathteachingresources.com) Extensive collection of free resources, math games, and hands-on math activities aligned with the Common Core State Standards for Mathematics
* <http://elementarymath.cmswiki.wikispaces.net/Standards+for+Mathematical+Practice> Common Core Mathematical Practices in Spanish
* <http://mathwire.com/> Mathematics games, activities, and resources for different grade levels
* <http://www.pbs.org/teachers/math/> interactive online and offline lesson plans to engage students. Database is searchable by grade level and content
* <http://www.k8accesscenter.org/training_resources/MathWebResources.asp> valuable resource including a large annotated list of free web-based math tools and activities.
* <http://www.cast.org/udl/index.html> Universal Design for Learning
* <http://engageny.org/wp-content/uploads/2012/05/Shifts-for-Students-and-Parents.pdf> Information for parents and students about the Shifts associated with the CCSS.
* <http://havefunteaching.com/> Various resources, including tools such as sets of Common Core Standards posters.
* <http://michellef.essdack.org/links> Numerous mathematics links.
* <http://illuminations.nctm.org/ActivityDetail.aspx?ID=27> NCTM Illuminations Patch Tool.
* <http://illuminations.nctm.org/ActivityDetail.aspx?ID=35> NCTM Illuminations Shape Tool.
* <http://illuminations.nctm.org/LessonDetail.aspx?id=L871> Lesson plan: Squares are Special Kinds of Rectangles
* <http://images.rbs.org/cognitive/van_hiele.shtml> or <http://gogeometry.com/mindmap/van_hiele_geometry_level.html>. van Hiele levels of Geometric Thought.
* <http://illustrativemathematics.org/> Tasks that align with the MD CCSS.

**Math Related Literature:**

* Burns, Marilyn. The Greedy Triangle.

Notes: A bored triangle visits a local shape-shifter to add another angle to his shape and becomes a quadrilateral. Then his greed causes him to keep adding angles until he's completely transformed.

* Casey, Beth; Paugh, Patricia; Ballard, Nancer. Sneeze Builds a Castle (Round the Rug Math: Adventures in Problem Solving).

Notes: Spatial concepts are taught in a systematic way through block building.

[Show More](http://www.amazon.com/The-Greedy-Triangle-Scholastic-Bookshelf/dp/0545042208/ref=pd_bxgy_b_img_y)

[Show Less](http://www.amazon.com/The-Greedy-Triangle-Scholastic-Bookshelf/dp/0545042208/ref=pd_bxgy_b_img_y)

* Friedman, Aileen. A Cloak for the Dreamer.

Notes: In this story, a tailor's son attempts to create a cloak with only circles, with unfortunate results. He then has to work to problem solve with his brothers to find a shape that works.

[Show More](http://www.amazon.com/dp/0590489879?tag=childrenspict-20&link_code=as3&creativeASIN=0590489879&creative=373489&camp=211189)

[Show Less](http://www.amazon.com/dp/0590489879?tag=childrenspict-20&link_code=as3&creativeASIN=0590489879&creative=373489&camp=211189)

* Macaulay, David. City: A Story of Roman Planning and Construction.

Notes: The text and black and white illustrations depict how the Romans planned and constructed their cities for the people who lived within them.

* Murphy, Stuart J. Give Me Half!

Notes: A rhyming verse allows the reader to enjoy the story of two siblings have to find a way to split a pizza in half.

* Parker, Robert Andrew Grandfather Tang’s Story

[Show More](http://www.amazon.com/City-Story-Roman-Planning-Construction/dp/0395349222/ref=cm_lmf_tit_15)

[Show Less](http://www.amazon.com/City-Story-Roman-Planning-Construction/dp/0395349222/ref=cm_lmf_tit_15)

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