CMS Lesson Plan

 Subject: Math Lesson Date: 1/25/2016 – 1/29/2015

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| **GSE Assessment Limits/Standards****Unit 5 – Standards****Solve real-w orld and mathematical problems involving area, surface area, and volume.****MGSE6.G.1 Find area of right triangles, other triangles, quadrilaterals, and polygons by composing into rectangles or decomposing into triangles and other shapes; apply these techniques in the context of solving real-world and mathematical problems.****MGSE6.G.2 Find the volume of a right rectangular prism with fractional edge lengths by packing it with unit cubes of the appropriate unit fraction edge lengths (1/2 u), and show that the volume is the same as would be found by multiplying the edge lengths of the prism. Apply the formulas V= (length) x (width) x (height) and V= (area of base) x (height) to find volumes of right rectangular prisms with fractional edge lengths in the context of solving real-world and mathematical problems.****MGSE6.G.4 Represent three-dimensional figures using nets made up of rectangles and triangles, and use the nets to find the surface area of these figures. Apply these techniques in the context of solving real-world and mathematical problems.** | **Tuesday & Wednesday – Thursday & Friday**Topic: Geometry (G)Find AreaUse NetsFind Surface Area using NetsFind VolumeSolve real-world and mathematical problems involving area, |
| **Lesson Objective/Learning Intention: (Objectives will vary depending upon the pace of the students)****By the end of this topic students should know:**Find the volume of a right rectangular prism with appropriate unit fraction edge lengths by packing it with cubes of the appropriate unit fraction edge lengths (e.g., 3½ x 2 x 6) and show that the volume is the same as would be found by multiplying the edge lengths of the prism. Apply the formulas V = lwh and V = Bh to find volumes of right rectangular prisms with fractional edge lengths in the context of solving real-world and mathematical problems.Clarification: It is not intended that this be modeled physically; it should be a conceptual activity modeled with drawings and diagrams.  |
| Review of 5.MD.5:* Explore with cubes and arrange them into layers to create rectangular prisms. Record the dimensions of the first/base layer, add a second layer, determine new dimensions, and look for patterns to predict what will happen when a third layer is added. Add the third layer and determine if your prediction was correct. Make connections to formulas.
* Hold up a cube and explain that the edge measures one unit and that is the standard for finding the volume of a solid figure. The volume of a solid figure is the number of same sized cubes filling the space so that there are no gaps and overlaps.
* Make nets of rectangular prisms on graph paper. Fold and determine volume.

• Define one cubic unit in order to see fractional parts. See resource.• Apply to formula using fractional edge lengths.**Mathematical Task:**Jaime has the following rectangular prisms (boxes) that he would like to send to his friend Carla through the mail:• Box 1 – 1 inches long by 4 inches wide by 6 inches height• Box 2 – 1½ inches long by 4 inches wide by 6 inches height• Box 3 – 3 inches long by 4 inches long by 6 inches height• Box 4 – 1½ inches long by ½-inch wide by 6 inches heightProcess between each step of the problem. How did the answer to one box lead to the answer for the next? Describe the effect of fractional edge lengths. What is the total volume of the boxes? Determine the dimensions of the smallest possible box that Jaime could use to send the 4 boxes to Carla in one shipment. How much empty space will there be? Prove your answer by drawing a representation on grid paper or constructing the boxes. |
| **Agenda:** **Students will enter the classroom quietly, pick up their word problem and take their assigned seat. Students will use their new math notebook beginning on page 1 to complete their Graphic Organizer (Tues-Fri). They will underline/highlight (pencil is required) key terms on word problem then attach it to the graphic organizer (Glue Stick is required). Students then will initiate a discussion to complete the graphic organizer sections: Understand, Model, Solve, Explain (in sentences), and Answer. (10 minutes)****Mon-Fri. Students will complete their warmup in their notebooks. (10 min)****Instruction (mini lessons) – Students will have an opportunity to use white boards, ELMO, Interwrite Pad, and/or computer to show what they know.****Review any Homework from Previous Class Meeting (Only in rare cases is homework taken up). Students may get in data-driven groups to talk about homework problems.****Current Lesson Instruction – Introduce Volume with centimeter cubes and 1-centimeter grid paper.****Students grab a handful of cubes and try to make as many rectangular prisms as they can using (every time) all of their cubes. Students should make a connection to volume and be able to derive at formula V=lwh****Real World Context Collaboration (Pairs)****Work Period - Problem Solving – Real World Problems****Notes and Examples – Students will be given notes (page # given to be put on their notebooks)****Closing – Summary of learning – Students should be able to answer E.Q. Closing may include Ticket out the Door.****DLIQ – Students write in their notebook at the end of each class day on designated page in notebook.****Quiz on 11/15/16**

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| **Assessment Tasks used** |
| **Skill-based Task:**Find the area of this trapezoid:  | **Problem Task:**Mario needs to buy sod for his backyard. Here is a diagram of Mario’s backyard. Determine how much sod he will need to purchase. | **Performance Task:****DOE Unit 5 Frameworks**Who Put the Tan in Tangram?What’s My Area?**RCPS Required Assessment**Foam Fish Tanks |

**Use pages 567 – 630 (depending on student progressions/abilities**

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| **MCC6.G.4 *Students are expected to:*** |
| Represent three-dimensional figures using nets made up of rectangles and triangles, and use the nets to find the surface area of these figures. Apply these techniques in the context of solving real-world and mathematical problems. |
| **MASTERY Patterns of Reasoning:** |
| **Conceptual**:Measuring with fractional units requires students to relate volume to multiplication with fractions.Describe the impact of defining volume by fractional factors.* The model shows a cubic foot filled with cubic inches. The cubic inches can also be labeled as a fractional cubic unit with dimensions of ft3.

**Description: 6g 2a** | **Representational**:Use a net to represent a 3-D figure.Use a net to find the surface area of a 3-D figure made up of rectangles and triangles (polyhedron).Compose and decompose a polyhedron using rectangles and triangles.Examples: * Describe the shapes of the faces needed to construct a rectangular pyramid. Cut out the shapes and create a model. Did your faces work? Why or why not?
* Create the net for a given prism or pyramid, and then use the net to calculate the surface area.

Description: 6g 4 copy | **Procedural**:Use these formulas interchangeably, V = *lwh* and V = *Bh*.Make the connection that when finding volume *l x w* is the same as B. |
| **Mathematical Task:**

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| **Academic Vocabulary and Notation** |
| volume, rectangular prism, length, width, height, base, cubic units, fraction edge length, unit fraction |
| **Instructional Resources and Tools** |
| **Manipulatives**Dot paperCubes of fractional edge lengthSquares that can be joined together used to develop possible nets for a cube.Use floor plans as a real world situation for finding the area of composite shapes. |

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| **Skill-based Task:**Find the surface area. | **Problem Task:**Belinda had two boxes to wrap for a birthday party. Box A has a length of 12 in, width of 8 in, and height of 6 in. Box B has a length of 11 in, width of 9 in, and height of 7 in. Which box will require the least amount of wrapping paper? | **Performance Task:****DOE Unit 5 Frameworks**How Many WaysPackaging Our GoodsBoxing Bracelets**RCPS Required Assessment**Foam Fish Tanks |

Make polyhedrons from given nets. Recognize the rectangles and triangles that compose the polyhedron. Find the area of each polygon and add together to find the total surface area of the polyhedron.Have nets on graph paper to aid in finding the area of polyhedrons. |
| **Website Resources: learnzillion.com (email me if you need a code), connected.mcgraw-hill.com (see my website for logon details)****Websites**Online dot paper: [http://illuminations.nctm.org/lessons/DotPaper.pdf#search=%22dot paper%22](http://illuminations.nctm.org/lessons/DotPaper.pdf%23search%3D%22dot%20paper%22) Lessons on area: <http://illuminations.nctm.org/LessonDetail.aspx?ID=L580>  |

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| **Resources/Instructional Materials Needed:** *(What do students need in order to learn what is required of this lesson)*Paper, pencil, binder, math notebook, 6th grade textbook (housed in the classroom), centimeter cubes, centimeter grid paper, ELMO, Interwrite Pad, attention and focus. |
| **Notes: Differentiation – Students will use models, hands-on, remediation where needed, small group with peers and small groups with the teacher, online resources, dot paper, centimeter grid paper.** |