Feature Lesson: Formulas for Volume and Surface Area of 3-dimensional figures

Block I – General Information

<table>
<thead>
<tr>
<th>Class: Math</th>
<th>Subject: Volume and Surface Area</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lesson Title: Finding the formulas for Volume and Surface Area of 3-dimensional figures and learning the definitions of terms related to volume and surface area.</td>
<td>Grade Level: 7th grade</td>
</tr>
<tr>
<td>Lesson Length: 60 minutes</td>
<td></td>
</tr>
</tbody>
</table>

Block II – Purpose

The purpose of this lesson is to help students learn the formulas for calculating volume and surface area of 3-dimensional figures and the definitions for the unit vocabulary.

Block III - Objectives

**Content Objectives**

All students will be able to create both online and paper flash cards to help them in learning and reviewing the formulas for calculating volume and surface area of 3-dimensional figures.

1. ELLs will become familiar formulas and vocabulary for the lesson.
2. ELLs will investigate the formulas for volume and surface area.
3. ELLS will create both online and paper flash cards.

**Language Objectives**

All students will be able to recognize formulas and names of 3-dimensional figures.

1. ELLs will read book to find the definitions for vocabulary.
2. ELLs will list the formulas for 3-dimensional figures.
3. ELLs will rewrite the formulas for volume and surface area and the term and definition of words related to surface area and volume.

**Culture Objectives:**

1. ELLs will pair with a native English speaking student to differentiate between the different geometric terms and definitions and practice pronunciation.
Block IV – Curriculum Goals and Objectives

North Carolina Standard Course of Study – Math Grade 7

Competency Goal 2: The learner will understand and use measurement involving two-and three-dimensional figures.
2.02 Solve problems involving volume and surface area of cylinders, prisms, and composite shapes.

Competency Goal 3: The learner will understand and use properties and relationships in geometry.
3.01 Using three-dimensional figures:
a. Identify, describe, and draw from various views (top, side, front, corner).
b. Build from various views.
c. Describe cross-sectional views.

Block V – Materials Needed for Lesson

Materials needed for lesson: pencil, paper, math book, laptop, scissors, index cards

Block VI – Content, Procedures, and Instructional Strategy

Activity 1 – Warm Up (review of area formulas of squares, rectangles, triangles, and circles). ELL students will use their notes/chart from the last chapter to find the formulas.

Activity 2 – Students will create flash cards on paper and on the computer using the following website http://www.flashcardmachine.com. Students will use index cards to make flash cards to take with them. ELL students will work together with an English language native to create their online and paper flash cards and then practice with them.

Activity 3 – Wrap Up (choose one term and definition you learned today and write it down). No accommodation needed for ELL students

Activity 4 – Students will be accessed on the accuracy, labeling, and formulas of the flash cards for Surface Area and Volume. No accommodation needed for ELL students since they worked with an English language native to create their flash cards.
Rubric for Making Flash Cards: Surface Area and Volume

Teacher Name: **Mrs. Ratledge**

Student Name: ________________________________________

<table>
<thead>
<tr>
<th>CATEGORY</th>
<th>4</th>
<th>3</th>
<th>2</th>
<th>1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Use of Class Time</td>
<td>Used time well during each class period. Focused on getting the flash cards done. Never distracted others.</td>
<td>Used time well during each class period. Usually focused on getting the flash cards done and never distracted others.</td>
<td>Used some of the time well during each class period. There was some focus on getting the flash cards done but occasionally distracted others.</td>
<td>Did not use class time to focus on creating the flash cards OR often distracted others.</td>
</tr>
<tr>
<td>Labels</td>
<td>All items of importance on the flash cards are clearly labeled.</td>
<td>Almost all items of importance on the flash cards are clearly labeled.</td>
<td>Several items of importance on the flash cards are clearly labeled.</td>
<td>Nothing labeled on the flash cards.</td>
</tr>
<tr>
<td>Required Elements</td>
<td>The flash cards include all required elements as well as additional information.</td>
<td>All required elements are included on the flash cards.</td>
<td>All but 1 of the required elements are included on the flash cards.</td>
<td>Several required elements were missing.</td>
</tr>
<tr>
<td>Correct Formulas</td>
<td>All formulas were correct on the flash cards.</td>
<td>4-5 formulas were correct on the flash cards.</td>
<td>2-3 formulas were correct on the flash cards.</td>
<td>Less than 2 formulas were correct on the flash cards.</td>
</tr>
</tbody>
</table>
### Block VII – Instructional Technology Used for Teaching

<table>
<thead>
<tr>
<th>Purpose for Technology</th>
<th>Point</th>
<th>Use of Technology</th>
<th>Purpose of Technology</th>
</tr>
</thead>
<tbody>
<tr>
<td>Instructional Technology for Teaching</td>
<td>1</td>
<td>Will use laptops and smart board</td>
<td>I will use these things to show students what they need to do.</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>Teacher Helper (Smart Board)</td>
<td>I will list directions/steps for class on the smart board for students to follow</td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>Teacher-made Resources for Students (Flash Card Machine website)</td>
<td>Example of flash cards are already on the website for students to see</td>
</tr>
<tr>
<td>Instructional Technology for Learning</td>
<td>6</td>
<td>Student Helper (Flash Card Machine website)</td>
<td>Students will practice with their flash cards once they are made.</td>
</tr>
</tbody>
</table>

### Block VIII – Author Identification

Lesson Author: Heather Ratledge
School: William Ellis Middle School
Signature: Heather Ratledge
Permission to Publish: Yes