**Lesson Plan Sem2-Lesson2**

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| **Name:** | 301 |  | **Course:** | Course 2 |  | **Grade:** | 7 |
| **Unit:** | Geometry |
| **Big Idea:** | Estimating size by attributes of geometric shapes |
| **Subconcept:** | Reasoning how volume and surface area affect each other |
| **Literacy Strategy(s):** | project, small groups discussion, teacher questioning |
| **Lesson:** | Volume vs. Surface area |  | **Date Taught:** | Feb 19th to24th, 2010 |
| **Learning Objective(s):**  |
|  |  Students will be able to | Find surface area and volume of 3-D shapes |
|  | Students will be able to | See a how surface area can directly affect the volume. |
| **Idaho Standards (or National Standards if no Idaho Standards exist):** |
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**Detailed Description of Lesson:**

* **Teacher tells students in small groups that they will need to brainstorm ideas to ask the questions in the handout. Teacher then gives handout: Questions 1 and 2: brainstorming to each group member.**
* **Teacher askes each student in the group to read silently and brainstorm some ideas to the questions and write them down. After a few minutes, have students share their ideas with the group.**
* **Each group is to then come up with what they agree is the best reasoning and complete the handout.**
* **Next have each group member choose one cereal box from the table and label it with their groups names and class period (students have been bring them in about a week). Then, they are to calculate the surface area and volume of the cereal box they have chosen. Groups may then compare answer with other groups to see if their answers are reasonable.**
* **Now, the real brainstorming the new design keeping the objective in mind –How can you decrease the surface area but increase the volume?**
* **Student will have a week to use trial and error and look at patterns for the shape that will work.**
* **Students design on graph paper and calculate until they have found a 3-D shape that will work for finding a cereal box with less surface area and more volume.**
* **Students will given any oral report in front of the class on how they problem-solved and came up with the design.**
* **They must finish which displaying the cereal box they started with and the new design. Then, they need the give the calculations on how much the volume increased and the surface area decreased.**

**Handouts:**

See attached

* Brain storming ideas
* Group discuss questions
* Final 3-D shape

**Student Work**

Brainstorming worksheets and graph models

Final 3-D Model (in picture form)

**Reflection:**

Complete the Lesson Reflection Form on the following page.

**LIMSST Project Literacy Lesson Reflection Form**

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| --- | --- | --- | --- | --- |
| **Name:** | 301 |  | **Date lesson was taught:** | Feb 19th-24th,2010 |
| **Lesson Title/Topic Areas:** |
| Volume vs. Surface Area |

**Literacy Strategies Used:**

* Brainstorming
* Discussion
* Prior knowledge to connect to

**Student Response to the Lesson:**

**Students seemed to enjoy the challenge of trying to make more volume with less surface area. The groups where very deep into discussion about what shape would do that. Some groups found a pattern early and realized you had to get a shape closer to a cube to decrease surface area and increase volume. The negative was that some students forgot the objective and began making shapes that not only did the exact opposite of what was asked they made shapes that they could find the surface area or volume to even compare the ratio.**

**Lesson Reflection:**

**I think I should have modeled more and done more practice with surface area and volume. I just didn’t want the students to just do like the teacher, however. I wanted creativity, which I got, but lost the objective at hand. I am going to teach this lesson next year but it needs more work to get students to think critically and keep on the task of problem solving, instead of what to name their cereal.**

**Relationship to Previous Instruction:**

The project came after learning perimeter, area, circumference, surface area, and volume in the Geometry Unit.