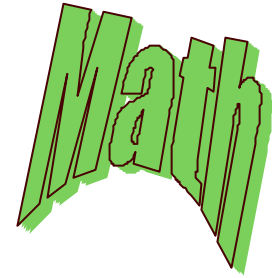# Algebra/Geometry Institute Summer 2005

Construct Figures to Find Specific Volume

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Grade Level: 6th

1   Teaching objective(s) Count number of cubic units in a given figure
                                            and construct figure to find specific volume.

2   Instructional Activities
   ± The teacher will brief the students on the fact that they worked on perimeter and
      area on yesterday.
   ± The teacher will ask the students if they remember how to find the area of a
      two-dimensional shape, such as a square.
   ± The students will give appropriate response.
   ± The teacher will then notify the students that on today we will be working with
      volume.

   ± The teacher will elaborate on volume for a brief time as well as give a few
      examples.
      Questions - Who can tell me what you think volume is?
      Answer – the amount of space a 3 dimensional figure encloses.
      Question- What is the formula for volume?
      Answer - V = Bh
                  V- volume, B – area of base, h- height
   ± The teacher will give the students an example to show them exactly what it is she
      is talking about.
      Example: A figure has a base that has a width of 4 centimeters and
                  a length of 3 centimeter;
                  a height of 4 centimeters

      What would be the volume of this figure? 48 cubic centimeters (area
                                                of the base times height)

   ± The teacher will reinforce that the volume is made up of cubes and therefore
      should be written in cubic units.
   ± The teacher will be sure that everyone has grasped the concept of the idea and
      assign each table a different figure to construct.
   ± The teacher will now give the directions to the assignment.

Directions:

First, the students will roll the die to determine the width, length, and height of the shapes and then construct these shapes.

Second, allow the students to decide who's going to roll first, second and third at their table.

Third, tell the students that the number player 1 rolls will be the width of the base of the figure and he/she will construct the base. Player #2 rolls the die and this number will represent the length of the base of the figure, player #2 will construct this part. Player #3 rolls the die and his/her number will represent the height of the figure and he/she will complete the construction of the shape.

Once the figure is constructed, the students can count the number of cubes in the figure. Let them discover that by multiplying the width x length x height they can find the volume without counting cubes. The teacher will tell the students, their reason for multiplying these particular parts is because the formula for Volume is $V = Bh$. (B = area of base)

± The teacher will walk around and monitor/observe the students' progress as they construct their figure. Once the students have finished allow them time to share their findings.

Group Activity :

Give each group a small box.
Students will sit four to a group for this assignment.
Each group will estimate the number of cubes that will fit in the container,
The students will check estimate by multiplying the length x the width x the height. **(V= Bh)**
We will then chart every groups findings to see how they differ.

Once I have received responses from all groups, we will orally review what we've gone over for the day.

3   Materials and Resources

Cubes
Dice
Containers
Chart
Hands on Measurement booklet (grades 3 -8) 2nd edition, 1991 by HANDS ON INC, page 93.

4   **Assessment**

Oral response - listen to student's response on questions asked while they are working.

Class assignment -see attatchment

Directions:

The students will be given a particular figure. The will work in groups to determine the volume of that particular figure. The students will be using cubes to fill the containers. The students will give an estimation first, then do the actual hands on process.

The teacher will monitor the students as they work cooperatively in their groups, asking and answering questions where needed.

Once each group has completed the assignment, we will discuss the results and chart them.

Estimation	Width of base	Length	Height	Actual findings