**Lesson Topic**

Water Displacement to Determine Volume

**State Standards**

3.MD.A.2

4.MD.A.2

5.MD.C.3

**Relation to USS Kidd**

The USS Kidd has a displacement of 2,050 tons. You need 363,000 pennies (at 2.5 grams each) to make a ton, and the value of the pennies is $3,632.

To equal the displacement of the Kidd you would need 744150000 pennies.

**Lesson Goal**

Students use the water displacement method to determine the volume of solid objects.

**Objectives**

The student uses the water displacement method to find the volume

**Materials needed for lesson**

-Beakers  
-Graduated cylinders  
-Water   
-10 Pennies   
-10 Nickels   
-10 Dimes   
-1 Rock   
-1 Marble

Lesson

1. Give each group one set of supplies.
2. Tell the students “Let’s find out how we can determine the volume of these coins.”
3. Go over the procedure for determining the volume of liquids using beakers and graduated cylinders. (Pour water into the container. Observe the container at eye level. Record the volume using the correct unit of measurement.)
4. Demonstrate the correct method of using beakers and graduated cylinders to determine the volume of solid objects using the water displacement method.  
     
   A. Using a beaker, pour water into a graduated cylinder. Record the volume of the water on the Volume Measurement Matrix.   
     
   B. Place one object into the cylinder. Begin with either pennies, nickels, or dimes. The water level will then rise. Record the new volume on the Volume Measurement Matrix.  
     
   C. Subtract the volume of the water from the volume of the water and the object. The difference will be the volume of the object.  
     
   D. Continue to add coins recording the change in volume as each coin is added. When the volumes of all coins have been found, record which coin has a greater volume.  
     
   E. Instruct students to follow the same procedure for finding the volume of the rock and marble.
5. Review: “What we have covered is how to determine the volume of a solid object using the differences in the volume of liquid after an object is placed into the liquid.”
6. Close: “Who can tell me what we have discussed today?”

**Assessments**

Completed Volume Measurement Matrix   
-Check for measurement accuracy.  
-Review the reflection portion and determine how reasonable each answer seems.