

Lesson Plan Outline		Teacher: Audrey Bergmann and Dagmar Wabel School: Elmcrest Elementary		
Subject: Sink of Float? Date: 3/21/11 Time: 2:00 pm	<i>Students will engage in:</i> <input type="checkbox"/> Independent activities <input checked="" type="checkbox"/> Cooperative learning <input type="checkbox"/> Peer tutoring <input type="checkbox"/> Visuals	<input type="checkbox"/> Simulations <input type="checkbox"/> Pairing <input checked="" type="checkbox"/> Hands-on <input type="checkbox"/> Centres	<input checked="" type="checkbox"/> Whole group instruction <input type="checkbox"/> Lectures <input type="checkbox"/> A project <input type="checkbox"/> Technology integration	
Standards/Objectives met: P.5.B.1 – Students know that, when an unbalanced force is applied to an object, the object either speeds up, slows down, or goes in a different direction. P.5.B.2 – Students know how the strength of a force and mass of an object influence the amount of change in an object's motion. P.5.A.1 - Students know matter exists in different states (i.e., solid, liquid, gas) which have distinct physical properties. P.5.A.3 - Students know materials can be classified by their observable physical properties				
Time	Procedures followed			Material
10 Min.	Engagement: Read the first half of the story "Archimedes and the Crown" to the children. When you get to the part where Archimedes starts to conduct experiments in his bath tube stop reading and announce that we will do similar experiments like Archimedes now.			Archimedes and the Crown
15 Min.	Exploration: The children go from table to table and drop different materials into the jars. They first make a prediction, then put the item into the water and after that record the outcome.			jars, objects, worksheets
10 Min.	Explanation: Hold a class-room discussion about the findings of the experiments. Then read the rest of the story as an explanation.			Archimedes and the Crown
15 Min.	Elaboration: Take some of the items the children had dropped into the jars and that sunk. Ask them to make a prediction and then drop the item into the salty water. Discuss the colour of the water and discuss what is different in this jar that makes the objects float.			jar with salt water
-	Evaluation: Thoughtful, thorough completion of the check-list. The students will write one paragraph explaining what characteristics the floating objects have, what characteristics the sinking objects have. They will provide examples of each. They will also include what they learned about things that sink and things that float.			worksheets

Archimedes and the Crown

Archimedes was a great scientist who lived more than 2000 years ago in a Greek city called Syracuse. He was very clever at inventing and figuring out how things work, so King Hiero needed his help many times.

Once King Hiero had a goldsmith make him a new crown. He gave the goldsmith lots of gold to make a big beautiful crown. The goldsmith made it shaped like a beautiful ring of gold leaves. But King Hiero told Archimedes that he was worried. He did not trust the goldsmith. The goldsmith could have kept some of the gold for himself and mixed something else with the rest of the gold to trick him.

King Hiero had a beautiful new gold crown, but was it really all gold? He wondered and wondered. He could find out by having the crown melted to see what it was made of, but then he would be starting all over again. Maybe the goldsmith would steal some of the gold the next time. He needed someone clever like Archimedes to help him.

Archimedes wanted to help King Hiero. The King should have a real gold crown! If the goldsmith was a thief, he should go to jail! But how could you find out without ruining the crown?

Archimedes was so busy thinking about the puzzle that he didn't pay very much attention to what he was doing when he was filling up his bath tub that night. When he got in to take a bath, water spilled all over the floor.

Now the thing that made Archimedes such a great scientist was that he always wondered about things. I wonder why the water spilled out when I got in? Obviously there wasn't enough room in the tub for him and all that water.

So how much water had to spill out? Archimedes took his bath toys and did some experiments.

The bigger something was, the more water spilled. So even if a bath toy had a very unusual shape, he could tell how big it was by how much water spilled out.

Archimedes noticed that some things that were big were very light and floated, but some things that were small were very heavy and sank. Archimedes called how heavy something was compared to how big it was **the density**. Everything had different densities. Things like rocks that had more density sank. Things like rubber ducky and Allie Alligator had less density and floated. Rubber ducky was lighter than rocks. He needed to find pretty small rocks for them to be smaller than rubber ducky.

Suddenly, Archimedes knew how to find out if the crown was real gold. He was so excited he shouted "Eureka!", which is Greek for "I found it!" He got up and went running through the streets of Syracuse shouting "Eureka! Eureka! Eureka!" Archimedes was so excited that when he got out of the bath he forgot he wasn't wearing any clothes!

Archimedes ran to King Hiero and announced that he could solve the crown puzzle. King Hiero said "That's great, but first put on some clothes!"

After getting dressed, Archimedes explained to the King how to decide if the crown was pure gold without ruining it. First he put the crown in a bowl of water and drew a line where the top of the water was. Then he took out the crown and put in gold until the water reached the line again.

Now Archimedes knew he had a pile of gold that was the same size as the crown. If the crown was pure gold, then it must be the right density for gold. So, if the crown was gold, and had the right density for gold, it must be exactly as heavy as the pile of gold. It would have to balance with the pile of gold. They put the pile of gold and the crown on different ends of a balance to find out.

Now they knew the truth about the crown. King Hiero was happy. Archimedes was happy. EVERYBODY WAS HAPPY!

Name: _____

Sink or Float Record Sheet

Item	My guess	Test

Which objects sink?

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Which objects float?

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What did you learn about things that sink or float?

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