

Stay-All-Day Activity (MS) – Organizer Notes



Sunken Treasure

Description: A design activity that involves the use of a chemical reaction to make a small container sink in a water tank and then, after approximately 15 seconds, rise to the surface again. Competitive.

Special Requirements: This activity involves water and harmless chemicals. Eye protection is required.

Materials: At each lab station, provide

1. Eye protection for each student.
2. A test tank of water that can accommodate a 10 cm x 10 cm x 10 cm container easily, filled to a depth of 20 cm.
3. A length of plastic mardi gras beads and about 45 grams of coins (9 nickels).
4. One 20-oz plastic bottle with tops, 2 yogurt cups, 10 Ziploc sandwich bags, 1 roll of masking or duct tape, ½ meter length of plastic wrap, scissors.
5. 10 Alka-Seltzer tablets (generic is acceptable).
6. One copy of the student handout.
7. Sponge and paper towels for clean up.

Each judge will need a stopwatch and pen.

Building: After reading through the handout with the students, give them 20 minutes to refine their design. Remind them that they must have enough Alka-Seltzer left to use during their demonstration test – you will not be providing more for the test.

Scoring: A judge witnesses the demonstration trial and records points for sinking and floating on the score sheet. To earn points, the treasure must still be in the container when it floats. The total time to sink and float is also recorded.

A decreasing number of points are awarded for having a total time closest to 15 seconds. For instance, if 5 teams are competing, the team with the total time closest to 15 seconds gets 5 points, the next closest team gets 4 points, etc.

Points earned:	1 point	2 points	3 points
Sinking	The object sinks less than half way to the bottom	The object sinks at least halfway to the bottom	The object sinks until it touches the bottom
Floating	The object rises less than half of the distance it sank	The object rises more than half of the distance it sank	The object surfaces and the treasure is still inside

Finally, teams are given 0-5 points for cleaning up their workspace (at the discretion of the judge). The team with the highest total number of points wins this challenge.

This activity was modified from the Royal Society of Chemists' "The Ups and Downs of Chemistry." <http://www.rsc.org/learn-chemistry/resource/res00001168/the-ups-and-downs-of-chemistry>. Accessed 23 Dec 2014.

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Stay-All-Day Activity (MS) – Student Handout



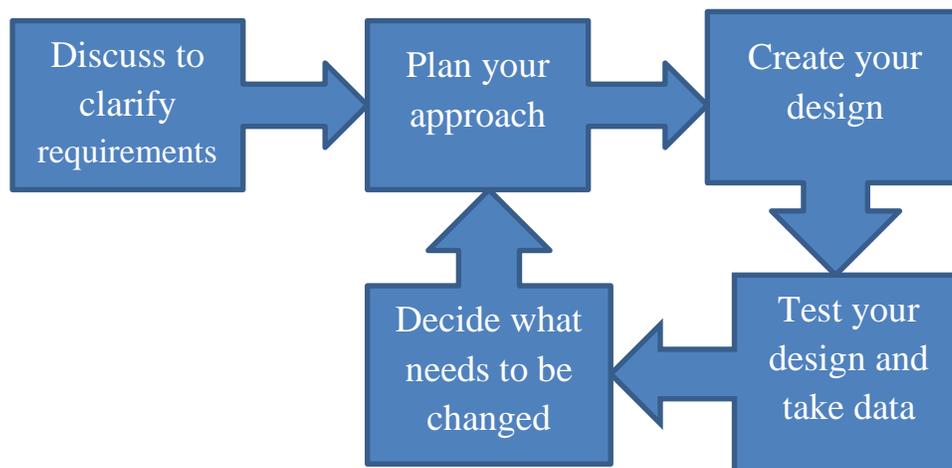
Sunken Treasure

Background: You never know when you might be on a ship and need to throw the priceless jewels and coins you are carrying overboard. This will certainly keep them out of the hands of the thief all the other passengers have been whispering about. But how to find them later?

Your Task: Design a container that will sink when initially thrown into the water and then, after approximately 15 seconds, will rise to the surface again.

Building Rules:

- You can use any of the materials on your table. The final dimensions of your object must not exceed 10 cm x 10 cm x 10 cm.
- Your “priceless jewels” must be in the container (plastic necklace and all coins).
- You may not touch or add anything to the container or to the water once the container is in the water. There can be no connection between the container and the surface of the water.
- Follow the design cycle of



- You will have 20 minutes to refine your design before the final test.
- If you use Alka-Seltzer in your design, you **MUST** have enough remaining after testing to use in your final demonstration test – you will not be providing more for the test.

Competition Rules:

ALL TEAM MEMBERS MUST WEAR EYE PROTECTION AT ALL TIMES. Removing eye protection will result in being disqualified.

- The container must reach the bottom of the test tank and then return to the surface of the water.
- Ideally, the total time to sink and then rise again should be 15 seconds. The teams coming closest to this time will gain the most points.
- Each team gets one chance to demonstrate their design for a judge.
- During the demonstration, each team will also earn between 0 and 5 points for the cleanliness of their workspace, so clean up before you ask a judge to come judge your design.

Team name _____

Sinks? 1-3	Floats? 1-3	Total time (sec)	Clean workspace? 0-5

Point total _____ **Judge's initials** _____

Upon completion of this event, turn in your completed score sheet to the activity judge.

Good luck, and thanks for Staying-All-Day!