

Floaty the Boaty



A Nurtured World

Overview:	Determine floating and sinking characteristics of various materials by experimenting with objects in water.
Environmental Objective:	Understand that water pollution can be man-made and connected to resources we use.
Grade 2 Science TEKS:	1(B), 2(A)(B)(C)(D)(E)(F), 3(A)(B)(C), 4(A)(B), 5(A), 7(A)(C), 8(A)(B), 9(B), 10(B) Please note that the full description of the Science TEKS, as well as English and Mathematics Grade 2 TEKS met by this lesson, are listed in a separate appendix.
Duration:	60 minutes total duration Lead in previous day through request to bring in materials 20 minutes preparation, initial discussion and instruction 25 minutes activity and exploration 15 minutes discussion and conclusion optional extension beyond 60 minutes
Materials:	Water basin(s) 3 gallon minimum, floating and “loadable” containers, tap-water, towel(s), spoons or small measuring cups. For loading — choose from any of the following: gravel, grass, sand, rice, paint, oil, sweets, miniature (plastic) animals and cars, etc. Students can be given the task in advance to bring in various containers that can float (such as used/cleaned “to go” boxes or old Tupperware) and miniature toys. For basins, large plastic supply boxes may be used. A world map would help to explain about the worlds’ waterways.
Lesson Instruction:	<ol style="list-style-type: none">1. Fill the basin(s) up to two thirds with water and distribute the containers and loading goods to each basin.2. Break the students into groups based on the number of basins. Alternatively, use one basin and have the groups take turns using the same. Using one basin will conserve water for this activity.3. Discuss the concept of (container) shipping goods, raw materials and food around the world and between countries. Use a world map to illustrate. <i>Where do the bananas come from that we eat and how do they get here? Where does the gasoline at the gas-station come from and how does it get here?</i> Note to Texas teachers: the majority of shipped goods in Texas come through the Port of Houston.4. Simulate the shipping process: In each group, have students choose to be shippers, loaders, or receivers. Loaders will load the boats, shippers will drive the boats, and receivers will unload and distribute the goods to their group.5. Each group can choose different goods to ship. There should be at

	<p>least two different types of goods with different weights and densities.</p> <ol style="list-style-type: none"> 6. In a discussion connect the goods to daily life. <i>Imagine your parents ordered the extra-soft sand for your sand-pit from far away and it needs to come here by ship.</i> Have students connect the other natural resources used in this activity and how we use them (grass-animal food, rice-human food, oil-raw material for making gasoline, plastic products like toys). 7. Have students predict how different items will behave in the ship and during the journey. <i>What is the difference between shipping rice, oil or grass? Is the weight the same? Will any make the ship sink if you put too much in? What will happen if you load your ship unevenly?</i> 8. Have the loaders load up their ship by measuring the load with a spoon or measuring cup. Have them write down how much the loaded. Have each group load their material differently, for example more or less material, uneven loads, even loads, etc. Have some sink due to overloading and spill their material into the basin. 9. Have the shipper drive the boat to the receiver. Have some students ship their goods with no spill. Have some create a spill due to sinking or tipping (due to poor loading or a storm). 10. Have the receivers unload, distribute and then name the use of the goods (feed the cows, deliver the cars, eat the sweets, etc.) <i>Does the stuff come to your home directly from the ship?</i> Discuss the effects of the spill on the environment and the life in the ocean. <i>How much more load made the ship sink? How much was the “right” load? Have students write down how much of each type of material overloaded the boat. What did the water look like when the oil spilled into it? What will happen to the cars on the bottom of the ocean? Can they still drive? Do the fish mind? What would happen if the fish could not find food anymore?</i> 11. At the end of the session discuss the appropriate disposal of the materials used and (if) why you only used one water basin.
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Reference Materials:	Log sheet for observations
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Optional Extend:	<ol style="list-style-type: none"> 12. Optional extend math: have the students draw pictures of the items that were loaded an order them from heaviest to lightest using the <, =, > symbols 13. Optional extend ELA: see reading passage and writing activity attached. 14. Optional extend science: elaborate on sinking versus floating of objects. Try out different objects (coin, rubber duck, apple, key, etc.). <i>What makes them sink or float?</i> 15. Optional extend environment: if a ship disposes of waste at sea and it sinks, is it gone? What happens once it is at the bottom of the sea?
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Floaty the Boaty – Log Sheet

Type of Material	How much overloaded the Boat?	How is this material used?	How does this affect the ocean if spilled?
Grass 			
Rock or gravel 			
Plastic toys 			
Oil 			
Treats 			
<p>Order the items from heaviest to lightest using the >, =, < symbols</p> <p>Lightest ----- Heaviest</p>			

Optional Extend: Reading and Writing on Plastic Waste in Oceans
(Adapted from article by James Owen for National Geographic News - May 6, 2004)

Beaches throughout the world show the ugly side of plastic waste on our oceans. Things like water bottles, plastic bags, jar lids, and toys litter the oceans. The impact of larger plastic waste on ocean life is well known. More than a million seabirds and 100,000 mammals and sea turtles die each year from getting tangled up in plastic waste or eating plastics. For example, wet plastic bags look like jellyfish to turtles and the turtles then eat the bags by mistake. This can kill a turtle because it blocks up their stomach.

Recently, scientists have found that large plastic waste is turning into tiny bits of plastic that look like sand. It's kind of like when you chop up vegetables smaller and smaller into a soup until you can't really see the vegetables any more. The plastic waste gets chopped up over time by the ocean movement (waves and rocks). Over time, the ocean turns the big pieces of plastic waste into tiny pieces of plastic that eventually look like sand. These tiny bits of plastic also end up inside fish which may eventually be eaten by people.

WRITING ACTIVITY: Write a story about what you can do to help stop plastic waste in the ocean. This story can be make believe (fiction) or can be realistic (non-fiction).