


Lesson Plan submitted by Cristina Solis

Narrative – This lesson plans allows all 8th graders at John Liechty Middle School (480 students) to use their understanding of buoyancy to understand the devastating effects of dumping toxic fluids such as motor oil and gasoline into our oceans.

Lesson Title	How much motor oil would you like in your bed?
Grade Level	8 th
Content Area	Science
Time Allotted	1 period – 83 minutes
Academic Standards	CA 8 – All objects experience a buoyant force when immersed in a fluid. 8.a 8.d
Abstract	Students will use their understanding of buoyancy to understand the tragic effects of the Exxon Valdez oil spill which covered 11,000 square miles of ocean causing the death of 500,000 seabirds, 1,000 sea otters, and 22 orcas, as well as the destruction of billions of salmon and herring eggs. The Coastal Ecology of the Bahamas expedition is an excellent bridge for understanding of the human impact on the environment as students see the gradual destruction of the island of Inagua via the Morton Salt Co. and compare/contrast it to the immediate (and long term) damage to the Artic by the Exxon Valdez oil spill.
Goal	Students will be able to... <ul style="list-style-type: none"> ▪ See a real world example of the properties of density and buoyancy ▪ Understand how human can and have dramatically changed the natural environment ▪ Use the properties of density in their every day world
Performance Indicators	<ul style="list-style-type: none"> • Define density and be able to use the density formula. • Compare and contrast two scientific phenomena and explain

	<p>their reasoning.</p> <ul style="list-style-type: none"> • Predict if an object or liquid will sink or float.
Background Information	Students should have already been introduced to concept of density.
Materials	<ul style="list-style-type: none"> • Science Journals • Pencils • Beakers • Water • Oil • Corn Syrup • Food Coloring
Technology	<ul style="list-style-type: none"> • LCD projector • Laptop • Video clip from National Geographic “Exxon Valdez Spill: 15 Years Later”
Instructional Procedure	<p>Introduction</p> <ol style="list-style-type: none"> 1) Show selected iPhotos of Morton Salt Co. from Coastal Ecology expedition.  <ol style="list-style-type: none"> 2) Ask kids to predict what they think these are pictures of – write the ideas in their science journals. 3) Class share. 4) Then discuss with students that they are looking at a very familiar business – the Morton Salt Co – and discuss with students how business and people can effect the natural environment. 5) Turn and Talk - Have students talk with a partner about other examples. 6) Then ask students to consider a company even bigger than Morton Salt and how that company might impact the environment. <p>Activities</p> <ol style="list-style-type: none"> 1) Show the video clip “Exxon Valdez Spill: 15 Years Later” 2) Ask students <ul style="list-style-type: none"> • Why this event was so disastrous to the environment?

	<ul style="list-style-type: none"> • Compare how Alaska is a home to arctic animals with your own home. • Why didn't the ocean water dilute the spilled oil? • Why does oil not mix with water? <ol style="list-style-type: none"> 3) Give each table team an empty 500 mL glass beaker, and three plastic cups containing 100 mL each of water (with blue food coloring), vegetable oil, and corn syrup. 4) Have students draw and describe each cup in their journal. 5) Turn and Talk - Have students predict what will happen if they combine all three liquids. 6) Have students slowly pour the water into the beaker. 7) Then have students slowly pour the vegetable oil into the beaker. 8) Have students describe and draw what they see in their journal. 9) Then have students slowly pour the corn syrup into the beaker. 10) Again have students describe and draw what they see in their journal. 11) Ask students <ul style="list-style-type: none"> • How does density play into this lab experiment? • How does density play into the Exxon Valdez situation? • Does density make the situation worse or better for the animals of Alaska? Why? • What are the consequences of the Exxon Valdez back in 1989? Now? • Why should we study historic tragedies such as the Exxon Valdez? What can we learn from past environmental mistakes? <p>Closure</p> <ol style="list-style-type: none"> 1) Make a Venn diagram <ul style="list-style-type: none"> • Effects of Morton Salt Co. • Effects of Exxon Valdez 2) Be prepared to present and explain your rationale
Assessment	Science journals and Venn diagrams will be collected and graded. Students will peer evaluate each other on oral presentations.
Connection to Other Content Areas	English – writing, compare/contrast History – historic environmental disasters
Extensions	Students can use the properties of density and buoyancy to explain other phenomena such as how do boats float, how do cruise ships float, etc. See lesson on “Build A Better Boat.”
Acknowledgements	National Geographic