

Activity Goals, Science Topics, and Standards Correlations for Immersion Presents *Secrets of the Gulf*

The Immersion Presents *Secrets of the Gulf* Adventure Series consists of eight activities covering geology, history, coral biology, ecology, archaeology, the nature of science, technology, and careers. The hands-on activities are geared toward grades 5 to 8 and are written at a sixth grade level. All of the activities are correlated to the National Science Education Standards for grades 5 to 8 as well as the 2005 Ocean Literacy Essential Principles and Fundamental Concepts.

Activity	Goals <i>Participants will:</i>	Science Topics
1: Rising to the Top	<ul style="list-style-type: none"> • learn about the origin and formation of salt domes in the Gulf of Mexico • identify three common types of sedimentary rock found in the Gulf • learn how petroleum is formed • model the rise of a salt dome 	rocks and minerals, sedimentary rock formation, petroleum formation, density
2: Colorful Corals	<ul style="list-style-type: none"> • learn about basic coral anatomy • make a model coral colony • simulate how coral polyps eat 	coral biology, structure and function
3: Coral Construction	<ul style="list-style-type: none"> • learn about the history of coral reef formation at the Flower Garden Banks • identify several conditions that must be present for hard corals to survive • name the seven different biological zones at the Flower Garden Banks • model the beginning of coral reef formation at the Flower Garden Banks 	coral reef formation, biotic and abiotic factors
4: It's All Connected	<ul style="list-style-type: none"> • learn how organisms can be classified according to how they get energy and what they eat • identify some of the organisms that live at the Flower Garden Banks • construct a Flower Garden Banks food web 	food chains, food webs
5: Manta Mysteries	<ul style="list-style-type: none"> • learn how photographs help researchers identify manta rays • describe how acoustic tagging is being used to investigate manta ray movement patterns at the Flower Garden Banks • play a game to simulate the identification of manta rays in the field 	manta ray biology, photo identification, acoustic tagging, nature of science
6: Journey to the Deep Seep	<ul style="list-style-type: none"> • learn about the brine seep features at the East Flower Garden Bank • define <i>density</i> and identify how it relates to the brine seep features • make a model of a brine lake 	underwater seeps, density, biotic and abiotic factors
7: Undersea Archaeology	<ul style="list-style-type: none"> • identify some of the unanswered questions in American archaeology • describe the archaeology component of the Secrets of the Gulf expedition • build and bury an ancient shoreline • model the use of a sub-bottom profiler to locate and map a buried shoreline 	marine archaeology, sea level changes, technologies used in ocean exploration
8: All Aboard!	<ul style="list-style-type: none"> • learn about the vehicles used in the Secrets of the Gulf expedition • describe the science goals of the expedition • play a game to learn more about the qualifications and roles of some of the people who participated in the expedition 	careers, archaeology, biology, geology, technologies used in ocean exploration

Activity	Correlations to National Science Education Standards (Grades 5–8)*	Correlations to Ocean Literacy Essential Principles and Fundamental Concepts**
1: Rising to the Top	<p><i>Standard D: Earth and Space Science</i></p> <ul style="list-style-type: none"> • Structure of the Earth system • Earth's history 	<p><i>Essential Principle 2: Ocean Shapes the Features of Earth</i></p> <p>a: Earth materials and geochemical cycles that originate in the ocean b: Sea level changes over time</p>
2: Colorful Corals	<p><i>Standard C: Life Science</i></p> <ul style="list-style-type: none"> • Structure and function in living systems • Populations and ecosystems <p><i>Standard D: Earth and Space Science</i></p> <ul style="list-style-type: none"> • Structure of the Earth system 	<p><i>Essential Principle 2: Ocean Shapes the Features of Earth</i></p> <p>a: Earth materials and geochemical cycles that originate in the ocean</p> <p><i>Essential Principle 5: Diversity of Life in the Ocean</i></p> <p>d: Life cycles, adaptations, and relationships among ocean organisms</p>
3: Coral Construction	<p><i>Standard C: Life Science</i></p> <ul style="list-style-type: none"> • Populations and ecosystems • Diversity and adaptations of organisms <p><i>Standard D: Earth and Space Science</i></p> <ul style="list-style-type: none"> • Structure of the Earth system 	<p><i>Essential Principle 2: Ocean Shapes the Features of Earth</i></p> <p>a: Earth materials and geochemical cycles that originate in the ocean b: Sea level changes over time</p> <p><i>Essential Principle 5: Diversity of Life in the Ocean</i></p> <p>d: Life cycles, adaptations, and relationships among ocean organisms e: Diverse ocean habitats from the surface to the sea floor f: Influence of environmental factors on ocean life</p> <p><i>Essential Principle 7: Ocean Exploration</i></p> <p>d: Technologies, sensors, and tools used in ocean exploration</p>
4: It's All Connected	<p><i>Standard C: Life Science</i></p> <ul style="list-style-type: none"> • Populations and ecosystems 	<p><i>Essential Principle 5: Diversity of Life in the Ocean</i></p> <p>a: Huge range in size of living things in ocean d: Life cycles, adaptations, and relationships among ocean organisms</p>
5: Manta Mysteries	<p><i>Standard A: Science as Inquiry</i></p> <ul style="list-style-type: none"> • Abilities necessary to do scientific inquiry • Understandings about scientific inquiry <p><i>Standard C: Life Science</i></p> <ul style="list-style-type: none"> • Populations and ecosystems <p><i>Standard E: Science and Technology</i></p> <ul style="list-style-type: none"> • Understandings about science and technology <p><i>Standard F: Science in Personal and Social Perspectives</i></p> <ul style="list-style-type: none"> • Science and technology in society <p><i>Standard G: History and Nature of Science</i></p> <ul style="list-style-type: none"> • Science as a human endeavor • Nature of science 	<p><i>Essential Principle 5: Diversity of Life in the Ocean</i></p> <p>a: Huge range in size of living things in ocean d: Life cycles, adaptations, and relationships among ocean organisms</p> <p><i>Essential Principle 7: Ocean Exploration</i></p> <p>b: Exploration, inquiry, and study of ocean systems and processes d: Technologies, sensors, and tools used in ocean exploration</p>
6: Journey to the Deep Seep	<p><i>Standard A: Science as Inquiry</i></p> <ul style="list-style-type: none"> • Understandings about scientific inquiry <p><i>Standard B: Physical Science</i></p> <ul style="list-style-type: none"> • Properties and changes of properties in matter <p><i>Standard C: Life Science</i></p> <ul style="list-style-type: none"> • Populations and ecosystems <p><i>Standard D: Earth and Space Science</i></p> <ul style="list-style-type: none"> • Structure of the Earth system 	<p><i>Essential Principle 1: Ocean Features</i></p> <p>e: Properties of salt water</p> <p><i>Essential Principle 2: Ocean Shapes the Features of Earth</i></p> <p>a: Earth materials and geochemical cycles that originate in the ocean</p> <p><i>Essential Principle 5: Diversity of Life in the Ocean</i></p> <p>d: Life cycles, adaptations, and relationships among ocean organisms f: Influence of environmental factors on ocean life</p> <p><i>Essential Principle 7: Ocean Exploration</i></p> <p>b: Exploration, inquiry, and study of ocean systems and processes d: Technologies, sensors, and tools used in ocean exploration</p>
7: Undersea Archaeology	<p><i>Standard A: Science as Inquiry</i></p> <ul style="list-style-type: none"> • Abilities necessary to do scientific inquiry • Understandings about scientific inquiry <p><i>Standard D: Earth and Space Science</i></p> <ul style="list-style-type: none"> • Structure of the Earth system <p><i>Standard E: Science and Technology</i></p> <ul style="list-style-type: none"> • Understandings about science and technology <p><i>Standard G: History and Nature of Science</i></p> <ul style="list-style-type: none"> • Nature of science 	<p><i>Essential Principle 2: Ocean Shapes the Features of Earth</i></p> <p>b: Sea level changes over time</p> <p><i>Essential Principle 6: Connections Between the Ocean and Humans</i></p> <p>b: Food, energy, mineral, and transportation resources from the ocean</p> <p><i>Essential Principle 7: Ocean Exploration</i></p> <p>a: The ocean as the last and largest unexplored place on Earth d: Technologies, sensors, and tools used in ocean exploration</p>
8: All Aboard!	<p><i>Standard A: Science as Inquiry</i></p> <ul style="list-style-type: none"> • Understandings about scientific inquiry <p><i>Standard E: Science and Technology</i></p> <ul style="list-style-type: none"> • Understandings about science and technology <p><i>Standard F: Science in Personal and Social Perspectives</i></p> <ul style="list-style-type: none"> • Science and technology in society <p><i>Standard G: History and Nature of Science</i></p> <ul style="list-style-type: none"> • Science as a human endeavor • Nature of science 	<p><i>Essential Principle 7: Ocean Exploration</i></p> <p>b: Exploration, inquiry, and study of ocean systems and processes d: Technologies, sensors, and tools used in ocean exploration f: Interdisciplinary nature of ocean exploration</p>

* For a complete listing of the National Science Education Standards (Grades 5–8), visit www.nap.edu/readingroom/books/nse/html/6d.html.

** Ocean Literacy Essential Principles and Fundamental Concepts are paraphrased for brevity. For a complete listing of the principles and concepts, visit www.coexploration.org/oceanliteracy.