TEXAS
SPACE GRANT CONSORTIUM
http://www.tsgc.utexas.edu/

GRACE Educational Curriculum OCEANS	
Teachers	Grades K-2
Science & Math	

Icy Monsters

Background Information: In the oceans at the North and South Poles the water is close to freezing. Snowflakes fall for hundreds of years and form large mountains. These mountains are called glaciers. Glaciers are enormous rivers of ice that originate on land. They can be miles deep and hundreds of miles long. They come in all different shapes and sizes. When a piece of ice breaks off a glacier and goes into the water it is called an iceberg. These glaciers and icebergs are very dangerous because of their mammoth size. Most of the iceberg is hidden under water. It may look small on the surface but how large it is under the water's surface is a mystery. These large icebergs have caused many ships to sink [like the Titanic]. GRACE will be able to collect data on glaciers from space. It can monitor the size and movement of the glaciers.

Objectives: At the end of the lesson, students will be able to:

- Define glaciers and icebergs.
- Understand the gigantic size of icebergs and the danger of these rivers of ice.
- Use a ruler to measure centimeters.

Standards: Science: unifying concepts and processes; earth and space science; and science as inquiry.
Math: measurement; computation & estimation

Vocabulary:

Glaciers	Iceberg
Mammoth	Measurement

Materials:

Pictures of Glaciers	Ruler
Water	Clear container

Clumps of ice cubes [teacher makes in advance]
Video on Icebergs or Glaciers

Directions to the Teacher:

1. Review the background information about glaciers and icebergs. Use picture books or images from the Internet to show students the size of these glaciers.
2. Tell students that we are going to see how dangerous these huge icebergs can be underwater.
3. Break students into groups or complete the experiment for the whole class (depends on age and ability level). Fill clear, plastic container with water. Take a clump of ice cubes and measure it from one end to another. Record the measurement. Place the ice in the water. Using the ruler measure the amount of ice that is above the surface and the amount of ice below the surface. Discuss the difference in these measurements.
4. Show Titanic video (only the section that shows the iceberg and the ship sinking) or a national geographic video on icebergs and glaciers.
5. Explain why glaciers and icebergs are important. They do not often kill people.
   - Over 10% of our land area is covered with glaciers.
   - Glaciers store about 75% of the world's freshwater.
   - Glaciers grow and shrink in response to climate change.
   - In Washington State alone, glaciers provide 470 billion gallons of water each summer.

Extensions:

- Draw a picture of a glacier and an iceberg.
- Compare and contrast glaciers and icebergs.
- Explain why icebergs can be dangerous.

References / Resources:

George, Michael. Glaciers. Creative Education, Minnesota, 1991.

Titanic video (Hollywood or Discovery Channel versions)

Books about the Titanic

Websites:

- http://www.titanic.com
- http://www.titanicmovie.com

Icy Monsters???

My iceberg is _____ centimeters long.

The iceberg on top of the surface is _____ centimeters long.

The iceberg underwater is _____ centimeters long.

Why is this difference dangerous for ships?