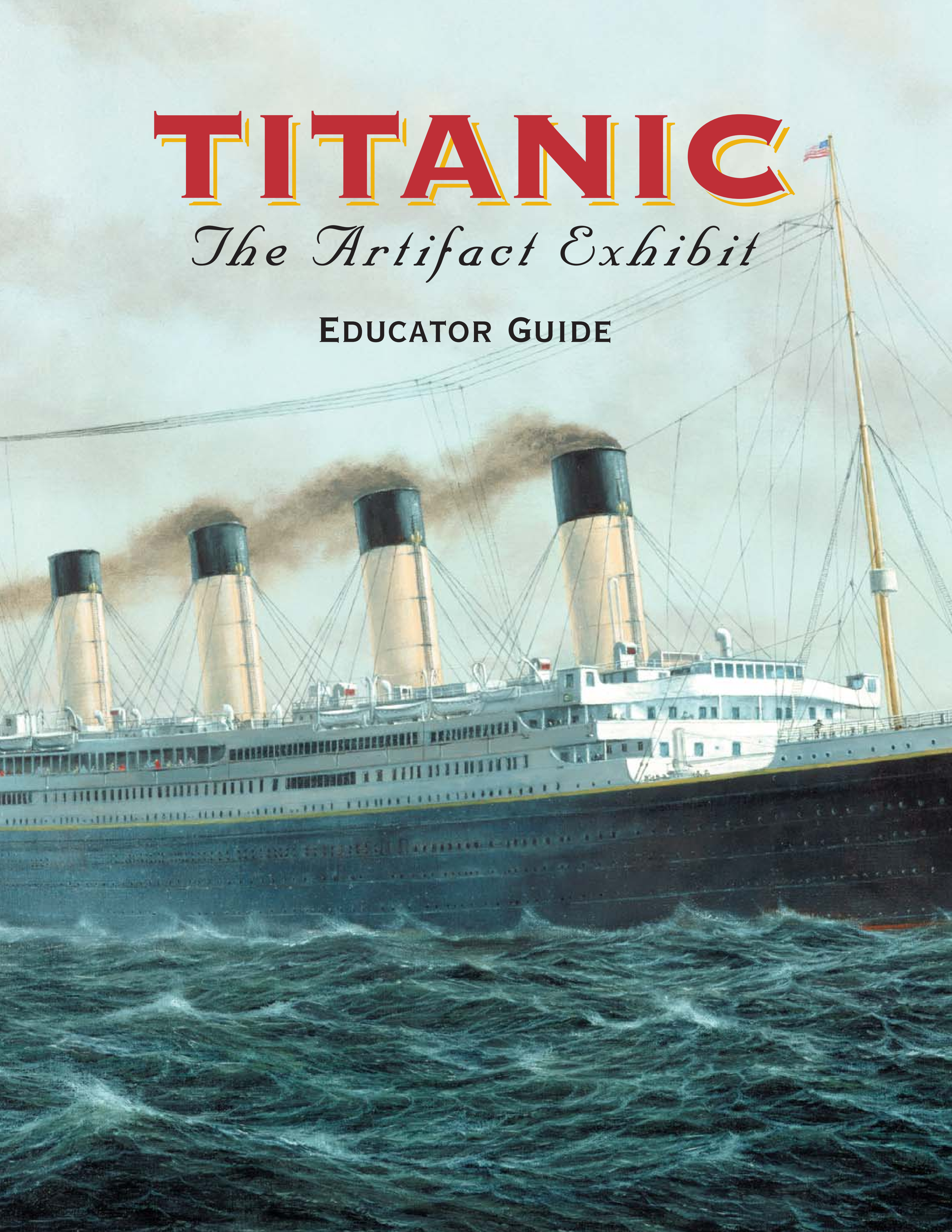
# TITANIC

## *The Artifact Exhibit*

### EDUCATOR GUIDE



# TITANIC
## *The Artifact Exhibit*

## Educator Guide

Get ready for the voyage of a lifetime with *Titanic: The Artifact Exhibit* at The New Detroit Science Center. The special exhibit includes recreations of the interior of the mammoth luxury liner, including the famous grand staircase and first- and third- class cabins. It also features actual artifacts from RMS *Titanic* recovered from the debris field of the wreckage. These artifacts range from passengers' personal items to a section of the great vessel's hull.

More important for educators, the *Titanic* exhibit is a great catalyst for lessons in history, geography, science, English, math and computers. Students already know the compelling story behind the ship's promise-filled voyage and tragic demise. These activities link that built-in interest to classroom-friendly lessons for students grades four through 12.

The lessons in this guide will be invaluable to educators wishing to generate student interest before visiting the exhibition and extend students' learning beyond their visit. Use this guide to help students write letters from the point of view of *Titanic* passengers, learn how artifacts are preserved, think about the history of safety regulations or understand the science behind the sinking of a ship. Make *Titanic: The Artifact Exhibit* the starting point for a great day of teaching.

*Titanic: The Artifact Exhibit* (Grade Levels 2-12)

**Exhibit Length** 45 minutes
**Exhibit Objectives** Students will be able to:

- List and describe different artifacts from *Titanic*
- Distinguish between the differences between the social classes and how they were treated in the early 1900's and discuss
- Construct a timeline or chart of events that led up to and after the sinking of *Titanic*
- Examine artifacts from *Titanic*
- Imagine the journey of *Titanic*

**Michigan Curriculum Framework Correlation**

| | |
|---|---|
| Historical Perspective | 1.1.EE.4; 1.1.LE.1; 1.1.HS.1; 1.1.HS.2 |
| | 1.2.EE.2, 4; 1.2.LE.1, 3, 4; 1.2.MS.1,2,4 |
| | 1.3.MS.3; 1.3.HS.2 |
| | 1.4.EE.2; 1.4.LE.2; 1.4.MS.3; 1.4.HS.2 |

GRADES
5-12

# Letters from Titanic

**A LANGUAGE ARTS/SOCIAL STUDIES ACTIVITY**


### OVERVIEW

Upon arriving at the exhibit, students will "board" the *Titanic*, where they will be given tickets with the name of an actual passenger who made the voyage. As they walk through the exhibit, with its recreations of several actual interiors of the ship including the famous Grand Staircase, students will interact with live interpreters in period costumes who will tell stories of *Titanic*'s brief but fascinating history. When students view two painstakingly recreated passenger cabins—one first-class and one third-class—they can imagine what it would have been like to actually sail on the *Titanic*. These two cabins will also vividly illustrate the sharp differences between the wealthy, often famous first-class passengers and the poor immigrants who crowded the third-class cabins.

After their visit to the exhibit, students can recreate the voices of actual *Titanic* passengers through this letter-writing activity. They will choose the names of one or two passengers from the first-class and third-class lists and write letters that they imagine these passengers might have written before the ship hit the iceberg.

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### CONCEPTS ADDRESSED

- **Social studies:**
  1. understanding social classes
  2. identifying the effects of class differences on everyday life
- **Language arts:**
  1. using creative writing skills
  2. creating a unique voice in writing
  3. understanding and using foreshadowing

### OBJECTIVES

- Students will identify some of the economic and social differences among first and third class passengers on *Titanic*.
- Students will write letters as if they were written by actual passengers on the *Titanic*; these letters will reflect their understanding of the typical experiences of the first and third class passengers.

### MATERIALS

- You will need access to the Internet in order to obtain names of actual *Titanic* passengers.
- Pen and paper or computer with word processing program

### PROCEDURE

This activity can take anywhere from 1-to-3 class periods.

**1. Before visiting the exhibit:** Define and discuss the terms "first class" and "third class."

a. Write the word "class" on the board and ask students to give a definition. Many students will give the definition that has to do with school—e.g. "English class" or "math class." Lead students toward other definitions of the word "class" by posing some of the following questions: What does "class" mean in the phrases "upper class," "middle class" and "working class"? What does it mean when a person flies "first-class" on an airplane? If students are not familiar with these terms, give them a brief definition of "class."

b. Tell students that on the *Titanic*, passengers could book passage in the first-class, second-class, or third-class cabins. Give them a brief list of the rich and famous people on the voyage, including Guggenheim and Astor. Also tell them that many of the passengers were immigrants from European countries such as Bulgaria, Sweden, and Ireland, traveling to America to begin new lives. Ask them to describe who they imagine were the typical first-class, second-class and third-class passengers.

c. Tell students that when they visit the *Titanic* exhibit, they will see recreations of first class and third class cabins. Ask them to notice some of the differences between these two rooms. You may wish to have students take notes while they are at the museum.

**2. After visiting the exhibit: Write letters from passengers**

Each student will choose two names—one first-class passenger and one third-class passenger—from a list of actual *Titanic* passengers. Lists of first, second and third class passengers can be found in the Encyclopedia Titanica. Scroll down a bit on the first page of the Encyclopedia Titanica, and click on the passenger lists. You may choose the passenger names yourself, or you may wish to let the students explore the site themselves. (Note: the passengers that survived the sinking are listed in italics; you may wish to choose only survivors for this activity, so as not to focus too much on the tragic aspect of the *Titanic*.)

Ask students to write two letters supposedly written by actual passengers and sent on April 14th, the day before the ship sank. You may wish to encourage younger students to write letters from the perspective of a passenger who was close to the students' age.

*Note: to reduce the length of this activity, have each student write one letter, with the class as a whole evenly split between first-class and third-class passengers.*

Here are some questions students can consider as they are writing the letters:

1. Who would this passenger write a letter to? A friend back home? A parent, child or sibling? A boyfriend, girlfriend, wife or husband? Create a fictional name and address for the recipient of the letter. Also, show how this passenger feels about the person he or she is writing to.

2. When did this passenger board *Titanic*? Why is he or she going to the United States?

3. What is the passenger's impression of the ship so far? Include some specific details about the size and the interior of *Titanic*.

4. How does this passenger feel about being on *Titanic*? Excited? Overwhelmed? Bored? Nervous? Sad about leaving home?

5. Include one detail that gives a hint about the unforeseen disaster about to happen. For example, the passenger could describe a small iceberg he or she saw from the deck of the ship, or comment about the coldness of the water.

6. What does this passenger do during the day? Describe his or her cabin, the meals, recreational activities, etc.

7. Would this passenger meet any interesting people aboard *Titanic*? Describe some of the people this passenger might have encountered in the several days he or she has been aboard the ship, keeping in mind that first- and third-class passengers were pretty much segregated.

8. What does this passenger expect to do or see once he or she reaches the United States?

*Note: Please give students the timeline in the sidebar to help with some of the above questions.*

## Assessment

Have students read their letters aloud to classmates or pass around their letters for others to read. After collecting the written products, evaluate the students' letters based on how well the students answered some or all of the above questions. The letters should reflect the students' understanding of the experiences of first and/or third-class passengers on the *Titanic*.

Letters may also be evaluated on the following writing criteria:

- student should create an interesting persona for the passenger the student has chosen
- student should create a consistent and engaging voice which communicates this persona to the reader
- letter should include foreshadowing of the *Titanic* disaster
- letter should be grammatically correct and appropriately paragraphed

### TIMELINE

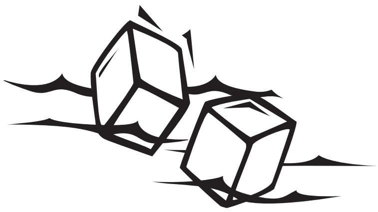
*Please give students the following timeline to help with some of the questions.*

- The *Titanic*'s maiden voyage began in Southampton, England at noon on April 10, 1912. The ship's destination was New York.
- On April 10 at 6:30 p.m *Titanic* arrived at Cherbourg, France, where many of its wealthy and famous passengers boarded.
- The ship's last stop was in Queenstown, Ireland, on the afternoon of April 11. At this port, a large number of third class passengers emigrating to the United States boarded *Titanic*.
- The ship struck an iceberg at about 11:40 p.m. on April 14. It sank during the early morning hours of April 15.

GRADES 6-9

# What Makes Things Float? Understanding Density

### A Science and Math Activity



#### DEFINITIONS

**mass=**amount of material in an object that, when placed in a gravitational field, gives the object weight (for our purposes here, we will use the terms weight and mass interchangeably

**volume=**the amount of space an object takes up

**density=**mass divided by volume

#### OVERVIEW

Before it sank, the *Titanic* was an awesome sight. It was about 882 feet long (almost the length of three football fields!) and weighed 46,328 tons. But how could such an enormous craft stay afloat in the first place? This intriguing question will be answered in the following activity, which challenges students to explain two simple phenomena: why ships float on water, and why ice (and icebergs) float. Students will learn about the concepts of mass, volume and density, and apply these to several ordinary real-life situations.

#### CONCEPTS

- Density=mass/volume
- Why ice floats
- Why ships float and sink

#### OBJECTIVES

- Students will understand and apply the formula for calculating density.
- Students will understand that objects which are less dense than water can float.
- Students will observe how water expands when it freezes and understand why ice has a lower density than water.
- Students will observe how air helps dense materials to float.

#### MATERIALS

- Two plastic soda bottles or milk jugs
- Small buckets of water (one for each group of students)
- Miscellaneous small objects—crayons, popsicle sticks, metal washers, etc. (optional)
- Empty tin cans (one for each group of students)
- Metal spoons (one for each group of students)

#### PROCEDURE

This activity will take about two class periods.

**1. Introduction:** Students should learn the definitions of the words in the sidebar.

**2. Why ice floats**

a. Fill two milk jugs or plastic soda bottles about halfway with water, showing the students that both of the bottles have the same amount of water. Then have a student weigh the bottles; they should weigh the same. Therefore, both bottles have the same mass and the same volume. Mark the water level on each bottle.

b. Freeze one of the bottles. *(Note: To save time, freeze one of the bottles in advance and start the activity at step c.)*

c. The next day, show the students the frozen bottle and the bottle of water. The ice in the frozen bottle will have expanded past the water level mark. Ask students which has more volume: the water or the ice? Students should see that the frozen water has more volume because it takes up more space. Then the students should weigh the two bottles to demonstrate that both still have the same mass.

d. Finally, ask students to figure out which has a higher density, the water or the ice? Remind students that density is defined as mass divided by volume. When water freezes and expands, it has more volume than unfrozen water. But the bottle of water and the bottle of ice still have the same mass, so which has a lower density, water or ice? *The answer should be ice.*

e. To help students see the concept of density in a different way, pose this question: which weighs more, a pound of lead or a pound of feathers? *(The answer, of course, is that they both weigh the same because they both have the same mass.)* But which has a greater density? The lead, of course, because it takes up less space so its volume is lower.

f. Explain that anything with a density lower than water will float. That's why icebergs float, though they don't float very high in the water because they are only a little bit less dense than water. Have students drop a few ice cubes in water to demonstrate that ice floats, so it must be less dense than water. In pairs or groups, students can also experiment with dropping various solid objects, such as crayons, metal washers, popsicle sticks, scissors, etc. into water to see which ones are more or less dense than water.

**3. Why ships float, why ships sink:** Now it's time for students to find out why ships such as the *Titanic* float despite being made of materials like steel, which is much more dense than water. Students will be given an empty tin can and a metal spoon which both weigh about the same.

a. Have students weigh both objects. Point out to students that these two items have approximately the same mass.

b. Then the students will put both items into water. The tin can will float, while the spoon will not. Ask students whether the spoon is more or less dense than water. *(The answer should be that the spoon must be more dense than water because it does not float.)*

c. Leave both the spoon and the can in the water. Ask students to explain why the tin can floats, given that its mass is about the same as the spoon's. Students should see that the tin can must have a lower density than the spoon. Ask students if the volume of the can is less or more than the spoon. *The answer should be that the can's volume is higher than the spoon's because it takes up more space.* Finally, students to think about what the tin can has that the spoon does not have. *The answer should be that the tin can has air.* Ask students to predict whether air would be more or less dense than water. Of course, air is less dense than water because air doesn't sink in water!

d. Students will then look back at the tin can, which by now has probably tipped over and started to fill with water. Students should fill the can entirely with water and watch it sink. Ask students to explain why the can no longer floats. *The answer is that the tin can no longer contains air, which is less dense than water. Instead, it contains metal, which is more dense than water, and water, which of course has the same density as water.*

e. Finally, ask students to use this experiment to explain why the *Titanic* sank when its hull was breached and water began pouring into the ship. Students should understand that a ship floats because its total density—composed of the density of its materials, such as wood and steel, and the density of air—is less than the density of water. When the air on a ship is replaced with water, the density of the ship becomes greater than water.

## Assessment

Students may report their results from steps 2f and 3 in a chart similar to the one below.

| Item dropped in water | Mass of item | Your prediction: will it float? | Your results: did it float? | Is it more or less dense than water? |
|---|---|---|---|---|
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| | | | | |

# Safety Regulations

GRADES 5-9

## A SOCIAL STUDIES ACTIVITY

### OVERVIEW

This lesson plan will ask students to think about how to develop effective safety regulations (such as requiring lifeboats on a ship) without creating unintended consequences such as in the case of the S.S. Eastland when additional lifeboats were added as a result of the *Titanic* tragedy.

### CONCEPTS

- The challenges of ensuring safety and preventing accidents
- Preventing unintended consequences

### OBJECTIVES

- Students will design a safety device for a common classroom hazard.
- Students will investigate other safety devices designed in response to disasters.

### BACKGROUND INFORMATION

One effect of the *Titanic* disaster was the call for safety regulations to prevent such a tragedy from happening again. Shipping lanes were shifted further south, all ships with more than fifty passengers were obliged to have a twenty-four hour radio watch, and ships were soon required to hold lifeboat drills and to carry enough lifeboats to hold everyone on board. Furthermore, the International Ice Patrol was created in 1914 and has sighted and tracked thousands of icebergs ever since.

Of course, there can be unintended consequences of these regulations. In 1915, in the Chicago River, the Eastland, filled with employees on their way to a company picnic, rolled over on its side with 2,500 people on board. Though the vessel was anchored only a few feet from shore, over 800 people died. There are several possible explanations for the disaster, but a major factor was the boat's top-heaviness, caused partly by the extra lifeboats added after the sinking of the *Titanic*. Because the lifeboats had been added to the Eastland without any engineering to compensate for the additional weight, these life-saving devices became lethal.

### PROCEDURE

This activity will take one to two class periods (perhaps more if the research extension activities are used)

1. Introduce the activity by asking students how many of them have ever ridden a bicycle. (Most will probably raise their hands.) Then ask students to raise their hands if they have ever fallen off a bicycle. (Again, many of the students will probably raise their hands.) Finally ask the students to raise their hands if they wear a helmet when they ride their bikes. (Probably less than half will raise their hands.) Ask the students to explain how a helmet helps make riding a bicycle safer. Tell the students that their community is considering a law that would require all children under 18 to wear a helmet at all times when riding a bike. Ask students their opinions about such a law. (A list of "pro's" and "con's" could be written on the board during the discussion.)

2. Tell students that today, they will be designing their own safety devices to protect their classmates from hazards in the classroom. Ask students to brainstorm a list of accidents that could occur in their classroom. (Some ideas might include tipping over chairs or desks, falling asleep during class and hitting their heads on the desk, stabbing themselves or others with sharpened pencils, or stapling their fingers.)

3. In groups of 2 to 4, have students design a safety device to prevent one of the accidents listed in their brainstorming. If there is time and materials are available, students could actually create the device. Otherwise, the design can be done on paper.

4. Explain to the groups that they should consider the unexpected consequences of the safety device. For example, a bike helmet can protect cyclists from head injuries, but it has to fit correctly or it might block a person's vision and cause an accident. Ask students to consider the possible unforeseen consequences of their safety devices and to make a plan to avoid such unintended hazards.

## ASSESSMENT

Students' safety devices can be evaluated according to their originality and/or usefulness.

## RESEARCH EXTENSION ACTIVITIES

1. Students could investigate other disasters which spurred new safety regulations, including the Triangle Shirtwaist Fire in New York City, the Great Chicago Fire, and the Beverly Hills Supper Club fire on May 28, 1977. They could report their findings to their classmates and perhaps comment on possible unintended consequences of the responses to these tragedies.

2. Students could investigate other safety devices that have had unintended consequences, including automobile seat belts, air bags, and carbon monoxide detectors.

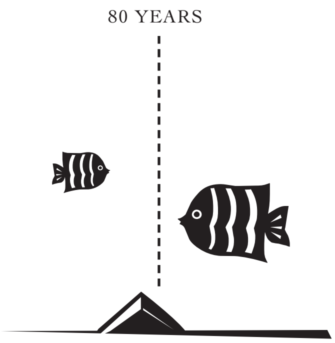
3. Students could interview their parents or other adults about new safety regulations implemented in their neighborhood or community. Perhaps the students could evaluate new safety laws to determine if they could have unintended consequences. Also, the students could identify potential safety hazards in their own school, neighborhood, or community and propose their own safety regulations to address these hazards, and analyze the possible unintended consequences of their proposed laws.

# Conservation and Restoration

GRADES

4-9

## A SCIENCE ACTIVITY




### OVERVIEW

The *Titanic* exhibit includes over 200 objects recovered from the wreckage of the ship 12,460 feet below the surface of the Atlantic. These items, which will be displayed throughout the exhibit to recreate the *Titanic* experience for visitors, have been conserved and restored as part of a significant scientific endeavor. In a conservation demonstration featured in the exhibit, students will learn about the science behind the preservation of objects that have spent more than 80 years at the bottom of the cold Atlantic. The following lesson will help students apply the principles of conservation and restoration to everyday classroom items.

### CONCEPTS

- Conservation and restoration
- Problem-solving

### OBJECTIVE

Students will examine objects that have been damaged and generate ideas about how to conserve the objects and restore them to their original condition.

### MATERIALS

Each group of students will need the following:

- Salt water
- Jars or bowls
- Construction paper
- Paper towels
- Plain white paper
- Paper clips
- Pencils
- Tape, glue, and stapler

### PROCEDURE

This activity will take one to two class periods.

**1. Introduction to conservation and restoration**

a. Tell students that they will be participating in an activity about conservation and restoration of objects in museums. Introduce the students to the basic principles by crumpling up a piece of notebook paper and holding up the crumpled-up ball for the students to see. Tell the students that this piece of paper is an ancient, valuable object that had been lost for years but has now been found in the back of a student's locker. This valuable artifact has just been donated to a museum. Ask them to imagine that they are scientists working at the museum and have been asked to conserve and restore this object. How would they go about this task?

b. Write these two words on the board: **conservation and restoration.** Explain that conserving an object means to prevent it from being damaged more than it already is. Restoring an object means to make it look as close to its original condition as possible.

c. Tell students that their first job is to conserve this valuable artifact. Point out to students that anything they do to the object might damage it further. How could they damage the object just by touching it? (Students will probably point out that their hands might be dirty or they might accidentally tear it.) Ask students to brainstorm ways they would handle the paper so that it will not be further harmed. *(Answers will vary.)*

d. Then tell students that their next task is to restore the artifact. First of all, ask the students what they think the paper looked like in its original condition. (Of course students will say that it was smooth, white and flat.) Ask students how they could restore the object so that it would be close to its original condition: How could they get rid of the wrinkles in the paper? How could they get the paper to lay flat? After students have explored this problem for a little while, tell them they are ready to be museum scientists!

**2. Conservation and preservation experiment**

a. Students will work in groups of two or three. Each group will receive the following materials:

- small piece of torn construction paper soaking in a jar or bowl filled with "ocean water," a.k.a cold salt water
- paper towels to dry the construction paper once it is removed from the jar
- sheet of plain white paper, randomly torn into 3-5 pieces
- large paper clip, bent and twisted
- pencil, broken in half
- tape, glue, stapler

b. Tell students that these are important artifacts found at the wreckage site of the *Titanic*. For each object, students will follow these steps:

1. Make a plan to conserve the object.
2. Decide what the object originally looked like.
3. Make a plan to restore the object.
4. Using tape, glue, staples or some other method, restore the object so that it looks as close to new as possible.

## ASSESSMENT

Students could report their results in a chart similar to the one below. Groups could be evaluated on how well they conserved the objects and how closely their restored objects resemble the originals.

- Description of object
- What condition did you find the object in?
- What techniques did you use to conserve the object?
- What techniques did you use to restore the object?
- How successful were your conservation and restoration efforts?

## FOLLOW-UP QUESTION

How did your strategy change as you worked on conserving and restoring the objects?

| Description of object | What condition did you find the object in? | What techniques did you use to conserve the object? | What techniques did you use to restore the object? | How successful were your conservation and restoration efforts? |
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# Plotting a Course

GRADES 4-8

## A Geography Activity

### OVERVIEW

Why did it take more than 70 years (1912-1985) to find the wreckage of the *Titanic*? One look at a map reveals the obvious answer: the *Titanic* sank in a vast, empty area of the North Atlantic Ocean, hundreds of miles from land. The following lesson asks students to imagine themselves in this same part of the Atlantic, navigating their own imaginary ship through a maze of icebergs. Students will work cooperatively to plan their ship's route and to react to information about new "iceberg sightings."

### CONCEPTS ADDRESSED

- Reading a map
- Plotting points on a map
- Making group decisions

### OBJECTIVE

Students will mark specific locations on a map and plot a course to avoid obstacles.

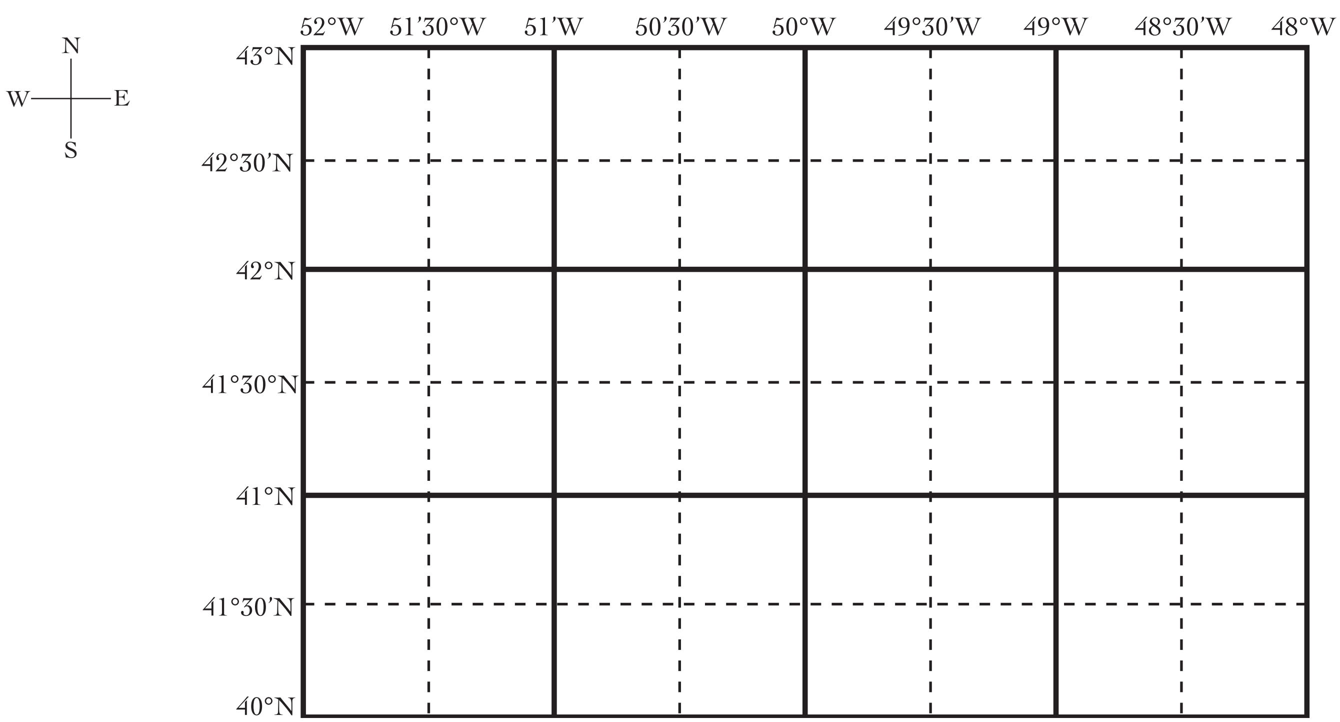
### MATERIALS NEEDED

A basic map is provided below.

### BACKGROUND INFORMATION

If students need a review of map terms, the following information may be helpful.

On maps of the Earth, the globe is divided into meridians of longitude and parallels of latitude. The meridians of longitude measure the distance from the prime meridian, which is an imaginary line which goes through Greenwich, England and both the North and the South Poles. The parallels of latitude are all parallel to the equator. Latitude is measured north and south of the Equator, and longitude is measured east and west of the prime meridian.



Latitude and longitude are measured in degrees, minutes and seconds. Each degree indicates one parallel or meridian. For example, a location at 40° N, 30° W would be at the 40th parallel north of the Equator and at the 30th meridian west of the prime meridian. Minutes and seconds are smaller units within degrees. A minute is 1/60 of a degree, and a second is 1/60 of a minute. A location at 40°20'15 N is at 20 minutes, 15 seconds north of the 40th parallel. The following activity will include locations expressed in degrees and minutes, but not in seconds.

## PROCEDURE

1. Distribute the map grid of a portion of the north Atlantic on page 11 to students (any map of the North Atlantic will also work). If necessary, review geography terms contained in the background information above.

2. Divide students into pairs. Tell students that they are about to embark on an adventurous voyage from England to America through the North Atlantic Ocean. Ask students to appoint roles in their groups: one student will act as the captain and one student will act as radio officer receiving messages from other ships. You may want to encourage each pair of students to give their imaginary ship a name like "The Detroit." You could also give the students a specific mission for their voyage: for example, their ship could be bringing immigrants to America, much as the *Titanic* did.

3. Give students the following information about their ship and the obstacles in their way:

a. Tell each pair of students that their ship is now at 49°W and 43°N. (Have students draw a small picture of a ship at their starting place.)

b. Tell them icebergs have already been reported in the following locations:

- 41°N, 49°30'W
- 41°31'N, 51°W
- 42°N, 50°W
- 42°N, 51°W
- 40°30'N, 50°30'W

Have students mark each of these icebergs on their maps with a big "I."

c. The students will navigate their ship in a southwestern direction, toward America. Have each team begin to plot out their course on the map, using a ruler to draw lines between points. Students should plot their courses in pencil, since they may need to change their plans later. In order to keep the activity relatively simple, have students use straight lines between the major points on the map. For example, students could move from their original location, 43°N 49°W, toward 42°N 49°W.

d. A few minutes into the activity, each radio officer should receive the "Emergency Ice Report" as seen below. The students must then adjust their course to take into account this new information.

## EMERGENCY ICE REPORT!

Red alert! Red alert! The radio room has just received the following reports of major icebergs spotted at the following locations. Please mark these icebergs on your maps and change your course to avoid the ice!

- 41°N, 50°W
- 40°30'N, 52°W
- 40°N, 50°W
- 43°N, 50°30'W

e. When students have successfully plotted a course to the far southwestern corner of the map, they will be on their way to America!

## ASSESSMENT

You may wish to collect students' maps to check the accuracy of their markings for iceberg locations and to evaluate the efficiency and logic of their courses. Students may also wish to compare their maps with other groups to see if their courses were different from their classmates'.

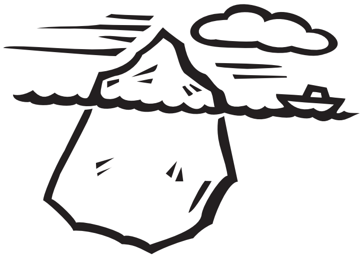
GRADES
4-7

# Icebergs

## A MATH ACTIVITY

### OVERVIEW

Perhaps one reason for the seemingly endless interest in the *Titanic* story is the image of a supposedly "unsinkable" ship colliding with a monstrous iceberg. These mysterious floating hunks of ice, some as big as a city, exert a strong pull on the imagination. In this activity, students will explore actual data on icebergs, compiled by the International Ice Patrol. They will learn about the sizes and frequency of icebergs and use data to perform simple calculations and create graphs.



### CONCEPTS ADDRESSED

- Multiplication, division and fractions
- Reading charts and graphs
- Calculating averages

### OBJECTIVES

- Students will perform a simple calculation using fractions.
- Students will read and interpret data on a chart and a bar graph.
- Students will create a line graph.

### MATERIALS

Access to the Internet is required because this activity is based on information found in the U.S. Coast Guard's International Ice Patrol web site. The web address is **www.uscg.mil/lantarea/iip/home.html**

For the following activities, the relevant information from the web site may be printed out in advance and distributed to the students.

### PROCEDURE

This activity will take one to two class periods.

**1. Using fractions:** According to the U.S. Coast Guard International Ice Patrol's web site, the iceberg that hit the *Titanic* was approximately 50 to 100 feet high and 200 to 400 feet long. Tell students that 7/8 of the typical iceberg is underwater. Then ask students to do a simple math activity calculating how much of the height of the iceberg was visible above water. Students may want to see a photograph of the iceberg which may have hit the *Titanic*. This photograph is available at the Coast Guard web site (**www.uscg.mil/lantarea/iip/ home.html**) under the Frequently Asked Questions (FAQ) section. Once you get to the FAQs page, scroll down to the section entitled "RMS *Titanic* Information" and click on question #1, "How large was the iceberg that sank the *Titanic*?" You will find the photograph on this page.

**2. Reading a chart:** Next, have students look at the Coast Guard site's chart which lists the different iceberg size classifications. This chart is also found on the FAQs page. Scroll down to the "Icebergs" section and click on question #4, "What are the shapes and sizes of icebergs?" Ask students to determine which classification the iceberg which sank the *Titanic* would fall into.

**3. Interpreting and manipulating data:** On the FAQs page, in the "Icebergs" section, click on question #3, "How many icebergs last long enough to reach the Atlantic shipping lanes?" There are two items found on this web site—a chart and a bar graph—which can be used by the students.

a. Have students examine the chart on this FAQ page which gives the number of icebergs passing through the Atlantic Ocean shipping lanes south of 48°N in the years between 1985-1996. Ask students to use this chart to create a line graph with the years from 1985-1996 on one axis and the number of icebergs in each year on the other axis.

b. On the same page, below the chart, there is a bar graph which gives approximate numbers for icebergs in the years 1900-1998. Once they have studied the graph, ask them to do the following:

- Use the data on the bar graph to calculate the average number of icebergs in each of the decades between 1900 and 1989. (Numbers will be approximate because the numbers of icebergs are expressed in intervals of 500.)
- Rank the decades (1900s through 1980s) from 1 (the decade with the most icebergs) to 9 (the decade with the fewest icebergs).
- Determine whether the decade in which the *Titanic* sank (the 1910s) was an average, above-average or below-average decade in terms of numbers of icebergs recorded. Do the same for the year 1912.

## ASSESSMENT

Students' performance on this task will be measured by the accuracy of their calculations and their graphs.

## EXTENSION AND ALTERNATE ACTIVITIES

1. If there are enough computers for each student (or pairs of students) to have individual connections to the Internet, students can explore the Coast Guard International Ice Patrol site on their own. Perhaps students could come up with a list of 5 or 10 facts they learned about icebergs from the site.

2. Have older students research scientists' theories on why there have been several spikes in the number of icebergs in the past 25 years. (One explanation is global warming.)

GRADES 5-12

# World Wide Web Scavenger Hunt

## A RESEARCH ACTIVITY

### OVERVIEW

Although *Titanic* sank almost 90 years ago and the wreckage was discovered in 1985, interest in *Titanic* seems to grow every year. Nowhere is this phenomenon more evident than on the World Wide Web, where thousands of sites cater to *Titanic* enthusiasts. The following activity will allow students to explore these useful sites and expand their knowledge of the *Titanic* disaster.

### CONCEPTS

- Problem-solving
- Research strategies

### OBJECTIVE

Students will explore various web sites for specific information about the *Titanic*.

### MATERIALS

Students must have access to the Internet.

### PROCEDURE

This activity will take one or more class periods.

Students may work individually or in pairs. Most of the questions can be answered using several different web sites, so occasionally the answers will vary. This activity can be shortened or lengthened according to the age of the students and the availability of class time.

After each question, the answer is indicated in italics.

### THE TITANIC WEB SCAVENGER HUNT

**A. Who's Who of *Titanic* History**

1. The president of the White Star Line was on *Titanic*'s first and only voyage. What was his name, and what happened to him when the ship sank? *Answer: J. Bruce Ismay escaped by lifeboat*

2. What was the name of the company that built *Titanic*? *Answer: Harland & Wolff*

3. Who was the captain of the ship? What happened to him when the ship sank? *Answer: Edward J. Smith went down with the ship*

4. Who was Margaret Brown, also known as "the unsinkable Molly Brown," and why did she become famous? *Answer: she was a first-class passenger who helped load people into lifeboats during the sinking of* Titanic. *After she boarded a lifeboat, she helped keep her fellow survivors calm and upbeat. Later she established a fund to aid impoverished survivors She was the subject of the play and film, "The Unsinkable Molly Brown."*

5. Who discovered the wreck site and when? *Answer: Dr. Robert Ballard, with the Woods Hole Oceanographic Institute in Massachusetts, led a team that discovered the* Titanic *wreckage on Sept. 1, 1985. Jean-Louis Michel of France was also part of the discovery effort.*

**B. Facts about *Titanic***

1. How much did it cost to build *Titanic*? How much would it cost now? (Hint: try the web site "The Life and Death of the RMS *Titanic*" for this question.) *Answer: $7.5 million; now it would cost about $400 million*

2. Why did the ship hit the iceberg sideways instead of head-on? *Answer: when the lookout officers saw the iceberg straight ahead, they ordered the officers on the bridge to steer the ship out of the way. However, the ship was too close to the iceberg, which scraped the hull, thus allowing water into the ship's lower decks.*

3. Why didn't the lookout officers see the iceberg until it was very close to the ship? *Answer: there was no moon that night; also there were no binoculars in the crow's nest where the lookout crew kept watch. The binoculars were aboard the ship on its first leg-Belfast to Southampton but were never seen after that. No one knows what happened to them.*

4. How long did it take *Titanic* to sink between the time it hit the iceberg and the time it it disappeared from view? *Answer: about 2 hours*

5. What was the name of the ship that picked up survivors in the lifeboats? *Answer: the Carpathia*

6. How deep is the ocean at the site of *Titanic*'s wreckage? *Answer: 12,460 feet or 2 ½ miles deep*

## ALTERNATE OR FOLLOW-UP ACTIVITY

Have a team or group of students create their own scavenger hunt, with a key for the correct answers. (It would be helpful if students also listed the web site where they found the answer to each question.) Then students can complete each other's scavenger hunts.

## ASSESSMENT

Students' scavenger hunt sheets can be collected and checked for accuracy.

# Building a Better Field Trip Experience

## Here are tips for getting the most out of your day with us.

### CONTACT INFORMATION

The New Detroit Science Center
5020 John R Street, Detroit, MI 48202
Reservations Department:
313.577.8400, option 5
www.detroitsciencecenter.org
fieldtrips@sciencedetroit.org
Reservation Department Office Hours:
Monday – Friday, 8:00 a.m. – 5:30 p.m.

### Reservation Procedures

To make a reservation, call 313.577.8400, option 5, Monday-Friday from 8:00 a.m. – 5:30 p.m. It is recommended that reservations be made at least three weeks prior to your visit. Please have the following information ready when calling:

- School Name
- School Address
- Telephone No./Fax No./E-mail
- Date/Arrival Time (select 3 dates)
- Group Contact
- No. of Students
- No. of Chaperones
- No. of Additional Adults
- Lunch Option
- Method of Payment

### Chaperones

Chaperones are an integral part of any group visit to The New Detroit Science Center. To ensure that all students receive a quality experience, groups must provide at least 1 chaperone for every 10 students. Special needs groups are encouraged to provide 1 chaperone for every 5 students. It is important that chaperones stay with the group at all times; they will be expected to act as supervisors and monitor the group's activities. All chaperones receive free general admission, but there is a charge for *Titanic: The Artifact Exhibit*, program and theater admission.

### Deposit Policy

A 50% non-refundable deposit is due within 2 weeks of making the reservation. This will guarantee your show or program in the theater and classrooms. The remaining balance is due 2 weeks before the scheduled visit. Groups not submitting their deposit will lose their reservation and their chaperone-ratio discount rate. Purchase orders are not accepted for deposits or payments. Mastercard, Visa, American Express and personal checks are accepted.

### Confirmation Packet

Once your deposit has been received, a confirmation letter and educators guide will be sent. It will include the day's schedule, Science Center information and map, program and curriculum guide and a free pass to explore the Science Center before your field trip. Please review this information with your students and chaperones before arriving.

### Science Store

To reinforce the Science Center experience, students have the opportunity to shop at our Science Store. If you do not have time to shop, special arrangements to purchase merchandise can be made in advance. Please call 313.577.8400, ext. 422.

### Bus Program

The New Detroit Science Center has negotiated a reduced bus rate with City Wide Transportation, Inc. Schools can take advantage of this special rate for field trips to the Science Center by calling City Wide Transportation at 313.921.5602. Be sure to ask for the Science Center rate! The Science Center cannot make transportation arrangements.

### Bus Parking

Buses may drop off students by entering the Science Center parking lot off of John R Street. Buses may park along Warren Avenue, John R or Farnsworth Avenue. Bus drivers are given free general admission.

**Note:** *The New Detroit Science Center reserves the right to change programs, policies and prices at any time without prior notification.*

## To make the most of your visit to *Titanic: The Artifact Exhibit*, we recommend you include the following:

### *Titanica* in the IMAX® *Dome* Theatre*

Take your students on a once-in-a-lifetime adventure of discovery to the site of the world's most famous shipwreck. In the eerie darkness, 2.5 miles below the surface of the North Atlantic, encounter the bent, rust-encrusted remains of the *Titanic*. On the giant domed screen, images of the once-luxurious liner are nearly life size. Experience the adventure, drama and danger of deep-sea exploration!

### *Night of the Titanic: The Science of the Sinking* in the Digital Dome Planetarium*

Join us on the deck of the *Titanic* on the fateful night of April 14, 1912 as we recreate the evening that the 'unsinkable' went to the bottom. Visitors to the Digital Dome Planetarium can enhance their *Titanic* journey by joining the passengers and crew in investigating the reasons that the great ship sank. Could it have been prevented? Patrons will find out in this new immersive experience.

### *Unravel the Morse Code* in the Ford Learning Resource Center (Grades 3-8)

Learn how to communicate strictly in Morse Code, just like on the *Titanic*. Learn how communication evolved around the turn of the century. Can you send the right message to save the ship?

**Educators Guides for theater shows and Ford Learning Resource Center programs available upon making a reservation.*

All Science Center exhibits and education programs for grades K-12 correlate to the Michigan Curriculum Framework.

# TITANIC

## *The Artifact Exhibit*

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# TITANICA

## *The IMAX® Experience*

**February 8 – September 7, 2003**

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