

Introduction

Purpose of Ocean Challenge Live!

On March 16, 2003, Captain Rich Wilson and crew member Rich du Moulin will embark on a nearly 15,000-mile voyage on the trimaran *Great American II*. They will sail the historic China tea trade route from Hong Kong to New York City, USA, in an attempt to challenge the record set in 1849 by *Sea Witch*, which completed the same voyage in 74 days, 14 hours. The crew will race against *Sea Witch*'s record to bring the excitement of the voyage to classrooms and schools around the world via the Internet at <http://www.sitesalive.com>.

A Brief History of the China Tea Trade

China has traded tea with the rest of the world for hundreds of years. Europeans began trading tea with China in the early 1600s, with the British maintaining the largest trade volume. They based their tea trade operations in the port city of Canton (Guangzhou), located on the Zhu (Pearl) River, 40 miles inland from Hong Kong. Early on, the process of getting tea to European markets was an arduous one. Tea was grown deep in the Chinese countryside. Harvested in the spring, the tea shipments took 3–4 months to reach the port of Canton. Another few months went by as European traders selected and loaded the tea aboard small cargo ships, then the slow voyage home to Europe took an additional 6–8 months, filled with hazards such as pirates, reefs, typhoons, and weeks stuck in the doldrums. That meant tea often reached its customers over a year after its harvest!

With Britain as the world's major tea importer, Britain's many colonies worldwide soon acquired a taste for tea, increasing demand. Demand was so great in Britain's American colony in the late 1700s that one of the colony's first revolutionary actions against its mother country was a protest against an increased tax on tea, resulting in the famed Boston Tea Party. After the American Revolutionary War, the newly founded United States of America entered their own merchant fleet into the lucrative China tea trade so as to take the control of such a valued commodity out of the hands of their British foes. In 1784, the American ship *Empress of China* inaugurated U.S.–China trade by sailing from New York to Canton with 30 tons of ginseng to trade for tea.

As tea gained further popularity as a beverage in both Europe and America in the 19th century, and customers clamored for ever “fresher” tea, commercial traders found they could not meet the growing demand with their small, slow cargo ships. Thus began the age of clipper ships: ships build for speed, supposedly so as to “clip” the time needed to get tea and other foreign cargoes to market in Europe and America (another theory suggests the name originates from the fact that the ships were designed to “clip,” or get the last ounce of speed from the wind).

Always looking for a competitive edge against their well-established European competitors, Americans were the first to see the need for clipper ships in the China tea trade. Their dedication to new and improved ship designs eventually resulted in the construction of the great *Ann McKim* in 1833. Over the next decade, American clipper ships were refined further, reaching a new level of workmanship with the *Rainbow* in 1845 and the *Sea Witch* in 1846. Built specifically for the tea trade, these two clippers combined grace and speed with large amounts of storage space, allowing massive cargoes of tea to be shipped home from China, all in less than half the time once needed for the voyage.



With their speedy ships, the American tea traders quickly gained the upper hand in the China tea trade, though the British East India Company (the major European tea supplier) soon caught on, building its own clipper ships to compete. The stakes were very high, as the first clipper ship to reach its home port (usually London or New York) each year could sell its cargo for a higher price, and crew members also received a generous cash bonus for their efforts. The difference in financial reward between being on the first clipper ship and being on those that came after led to a tradition of exciting annual sailing races along the China tea trade route. Each year, clipper ships full of tea left China's harbors, often on the same tide, then raced neck and neck all the way home. Back in Europe and America, these races were not only followed by the tea merchants but also by the general public, who avidly scanned newspaper headlines for updates on the clipper ships' progress.

One of the most famous clipper ship voyages of the China tea trade was that of the *Sea Witch*, which sailed from Hong Kong to New York in a mere 74 days, 14 hours. Its arrival in New York on March 25, 1849, was met with public disbelief and wonderment, as the annual race of tea trade clippers had not been expected to make port for at least another two weeks. Luck combined with the *Sea Witch's* amazing speed and the sailing skills of Captain Robert "Bully" Waterman led to a sailing speed record that has not been beaten to this day.

Clipper ships remained a popular mode of cargo transport well into the 1860s, bringing great fortune to those who invested in their speed. However, the increasing use of the newly invented steamship threatened the domination of clipper ships in world trade. When the Suez Canal opened in 1869, providing a "shortcut" to Western markets for the "slow but steady" steamships, the clipper ships lost their commercial edge in the China tea trade. The era of the tea clippers was over.

Program Components

The descriptions below highlight the various components of *Ocean Challenge Live!* and how these components can be used to enhance students' experiences as they follow the voyage of *Great American II*.

Internet Connection

Updates of the 2003 voyage are available in *Ocean Challenge Live!* on the sitesALIVE! website at <http://www.sitesalive.com>. These updates include:

- Captain's Logs & Audio, Ship Positions, Weather Reports (updated daily)
- Questions & Answers (updated three times/week)
- Essays, Journals, Photos, Video (updated weekly)

By visiting the website and combining the live content with the lessons in this Teacher's Guide, teachers can make this adventure a true educational experience for their students. Other materials available on the website include biographies of the crew, a ship tour, an active message board, a glossary, and information about sitesALIVE! and its partners.

Lesson Plans

Twelve weekly lesson plans have been designed to develop students' academic and life skills. The lessons are designed so that students use the same important skills required of the *Great American II* crew: planning and teamwork. The complete course of study can be organized around the activities built into each lesson plan, or teachers can use activities as they see fit.

Team Projects

In addition to weekly lessons, this Teacher's Guide includes eleven Team Projects for students to complete. A detailed project guide is provided for each Team Project to help students complete the required tasks and assignments. Student should be split up into teams to conduct these projects throughout the voyage of the *Great American II*. Each student team has the opportunity to present a detailed report on their work to the class once during the voyage. Each team should also present a brief project summary on a weekly basis to the class.

Home Connection

Home Connection activities are designed to involve families and friends in the *Ocean Challenge Live!* experience. Through these activities, parents can be encouraged to work with their children on the weekly activities. Many of these activities are discussion topics or short-term projects.

Newspaper Connection

Newspaper Connection activities are designed to develop students' reading and research skills. The weekly activities are coordinated with the lessons so that students can make a connection between the newspaper medium and their own classwork. Students participating in *Ocean Challenge Live!* thus come away with enhanced reading and research skills, as well as a new appreciation of the value of newspapers as an information source.

Lesson Plan Components

Each lesson plan contains the following components:

Theme: A theme relating to the journey.

Interdisciplinary Connections: A list of disciplines that the lesson plan incorporates, such as geography, math, science, history, art, architecture, social studies, language arts, and technology.

Skills: The types of skills students will use as they work on the activities in the lesson. These include both academic and life skills.

Key Words: Words that are significant to the content of the lesson.

Materials

Instructional materials needed to carry out the lesson plan. Certain materials are used on a regular basis and may not be suggested every time (e.g., a regional newspaper, materials on the sitesALIVE! website, and a globe or world map).

Introducing the Lesson

A way to orient students to the theme of the lesson. This can be a discussion topic, demonstration, or activity.

Classroom Activity

A skill-building activity involving the use of information about *Ocean Challenge Live!*.

Home Connection

An activity that links the *Ocean Challenge Live!* lesson plan to family and friends at home.

Map/Math Connection

An activity which develops students' knowledge of geography and their skills in making and using maps. These activities most often apply mathematics to the study of geography.

Team Project Connection

Suggested team activities and presentations related to the weekly theme. Prior to the beginning of the program, organize students into teams that will work on specific projects. Although it is suggested that the teams regularly give a brief update of their topic, each week one designated team will give an in-depth classroom presentation on their topic or task to that point (the History Team will be first and will give their report during Week 1). Student teams are provided with specific guides to help them fulfill their responsibilities and complete their project.

Newspaper Connection

An activity, focused on the weekly theme, that involves students using the newspaper.

Team Project Summaries

Suggested team projects are provided below to focus on different aspects of *Ocean Challenge Live!* Each team project is linked to a weekly lesson. Assign students to work in groups to take responsibility for the projects. Organize a “team of the week” approach, scheduling one group to report its findings to the class each week. This can be a full-class presentation. There are a total of eleven team projects, as there is no project or presentation linked to Week 10. This week can be used as a “catch-up” week if needed, or, since the Classroom Activity for Week 10 involves a lot of teamwork, students may use that time to accomplish their project goals.

Use the project summaries below and the corresponding Team Project Guides as you organize students and assign tasks. It is also suggested that each team be invited to give a brief update once a week. Schedule at least one collaboration session weekly so groups can update their work.

History Team Project (Week 1)

Learn about and report on China’s tea trade, including its politics, trade routes, varieties of cargo and main players (countries). Find out how ship designs and other navigational tools have changed the way shipping cargo has evolved.

- Collect information from history textbooks, encyclopedias, navigation resources, and the Internet to demonstrate the ways in which shipping has changed in the past three centuries.
- Find out about the history of the development and design of the clipper ship.

Nutrition & Health Team Project (Week 2)

Learn about and report on the food, water, medical, and sleep needs of the *Great American II* crew. Keep in mind that there is no refrigeration on board; water is desalinated; and Rich has severe asthma.

- Find out the average adult male’s needs in terms of nutrition, then determine the needs of an individual doing strenuous work for up to 18 hours a day. Do climatic changes affect these nutritional needs? If so, in what way?
- Contact a health professional, pharmacist, or the American Lung Association to obtain information about the causes, treatment, and health risks of people with severe asthma.
- Research essential sleep requirements and recommend a “watch” system for the *Great American II* crew.

Navigation Team Project (Week 3)

Learn about and report on navigation methods, weather systems, and climate patterns.

- Plot the weekly position of *Great American II*. Calculate distance traveled and average speed, and predict future positions.
- Research the various climates and ocean currents *Great American II* will pass through, including trade winds that affect the speed and direction of the boat.
- Find out the distance/direction to the nearest landmasses.

Geography & Environment Team Project (Week 4)

Research and report on the physical features and environmental concerns of the regions that the *Great American II* passes.

- Collect information, from atlases and encyclopedias, about the regions traveled and countries passed along the route. This research can be divided among the team members with each member taking a few weeks' locations to study.
- Learn about and report on the environmental issues facing the oceans and countries that the *Great American II* passes. Include such contributing factors as: fishing and shipping industries, weather, balanced vs. unbalanced marine ecosystems, land-based pollution from industrial growth, oil drilling etc.

Energy & Mechanics Team Project (Week 5)

Learn about and report on electricity generation (solar, wind, diesel generator) and use (lights, computers, radios, autopilots, desalinator, etc.). Report on the mechanics (sails, ropes, and pulleys), flotation, structure, and materials of the *Great American II*.

- Collect information on basic elements of sailboats. Find out more about trimarans and the advantages and disadvantages of monohulls and multihulls.
- Determine strategies to conserve energy on board and deal with unexpected energy needs.

Information Team Project (Week 6)

Collect and distribute pertinent data and information to the other teams regarding the voyage. Maintain a timeline.

- Seek daily information and data from all available sources (newspapers, encyclopedias, people interviewed, the sitesALIVE! website, etc.)
- Listen to the daily audio updates to get information about the trip and sense the crew's mood. (All the teams on a rotating basis could share this responsibility.)
- Maintain a timeline display for the duration of the voyage. This should include items collected from the other project teams.
- Create and post information on a chart and bulletin board display under the titles "Focus of the Weekly Update," "Significant Events from the Daily Audio Updates," and "Stateside Information."

Weather Team Project (Week 7)

Learn about and report on the weather systems and climatic patterns that affect the *Great American II*'s journey.

- Use the sitesALIVE! website to collect information and report on the air temperature, sea temperature, wind direction and velocity, and rainfall.
- Document the occurrences of storms that the *Great American II* experiences.
- Find out how the climatic patterns affect the weather changes.

Marine Life Team Project (Week 8)

Research and report on the vast array of marine life found in the regions through which the *Great American II* passes.

- Find out about the variety of vertebrates (fish, reptiles, marine mammals, birds) and invertebrates that populate the oceans along the journey. Learn about food chains, food webs, and migratory routes that any of these animals may take.
- Collect information on various marine-related industries based near the regions in which the crew will travel and the impact these industries may have had on local marine life. Include fishing, whaling, oil exploration, and shipping.
- Record wildlife sightings and encounters reported by the *Great American II* crew.

Teamwork Team Project (Week 9)

Learn about and report to the class on the biographies of the *Great American II* crew. Include their mental, physical, academic and emotional strengths and/or weaknesses. How do their strengths contribute to their teamwork?

- Collect information about the progress and problems of the *Great American II* crew from the sitesALIVE! website. Be sensitive to the feelings that the crew's voices communicate.
- Find out about how industries employ a team approach to produce products (e.g., Toyota Manufacturing).
- Create a guide for successful teamwork projects.

Communications Team Project (Week 11)

Research and report on the radio and satellite transmission systems on board the *Great American II*. Compose weekly updates for the crew about local and national events "on shore."

- Find out how radio and satellite communications work and what their respective advantages are. Compare the frequencies the crew uses to those used for television and FM radio.
- "Digest" the newspaper and keep a record of summarized reports to be sent to the crew. Topics can include national and international events, politics, and sports. You might also include the significant local news that directly affects people's lives in your own community.

Book & Movie Team Project (Week 12)

Write the story of the voyage in book form, then create scenes and dialogue for a movie or play.

- Use information from the sitesALIVE! website and information from other student teams to write this story.
- Students with a special interest in art may work as illustrators on this team.

Lesson Plan Outline

Week 1 – China: History and Geography

Theme: Historical Perspective

Skills: Mapping, journaling, sequencing events, locating landmarks, research

Week 2 – Getting Ready

Theme: Vision and Motivation

Skills: Designing a model, calculating speed, mapping, using a log, research

Week 3 – Equator Crossing

Theme: Observing Traditions

Skills: Brainstorming, classification, research

Week 4 – Environment: Water and Air

Theme: Environmental Resources and Impacts

Skills: Converting fractions and decimal percents, model making, writing, graphing, reading maps

Week 5 – Invisible Places

Theme: An Understanding of “Place”

Skills: Mapping, research, letter writing, using empathy, orienteering (using a compass)

Week 6 – Midpoint

Theme: Turning Points

Skills: Using perspective, predicting, drawing (maps), research

Week 7 – Decision-Making

Theme: Making Decisions

Skills: Making decisions, reading maps, collecting data

Week 8 – Wildlife

Theme: Adaptation & Interconnectedness

Skills: Brainstorming, graphing, identifying cause and effect, calculating, research

Week 9 – Teamwork & Perseverance

Theme: The Team’s Commitment

Skills: Making decisions, collaborating, showing respect, research

Week 10 – Forces of Nature

Theme: Natural Forces

Skills: Collaborating, mapping, research

Week 11 – What We’ll Miss

Theme: Perspective

Skills: Graphing, map reading, averaging, narrative writing

Week 12 – Defining Success

Theme: Defining Success

Skills: Mapping, drama, creative expression, setting goals, planning, making decisions, writing

Week 1 – China: History & Geography

Theme: Historical Perspective

Interdisciplinary Connections: History, geography, social studies, language arts

Skills: Mapping, journaling, sequencing events, locating landmarks, research

Key Words: Dynasty, sphere of influence, Boxer Rebellion, Republic, Nationalist, Sun-Yat Sen, Chiang Kai-shek, Communism, Karl Marx, Mao Zedong, trade, imports, exports, Silk Road, Marco Polo, Beijing, Hong Kong, Shanghai

Materials

Classroom Activity: library resources, roll of paper or individual sheets for a timeline, meter stick; **Map/Math Connection:** large map of China (including major cities, bordering countries, oceans, rivers and seas) (provided), blank blackline master map of China, world history books

Introducing the Lesson

Provide students with a brief overview of Chinese history, such as the one detailed below, then have them read *A Brief History of the China Tea Trade* at the beginning of this Teacher’s Guide.

About 1.2 billion people, or one in five people on Earth, live in a single country: China. China is a vast country of many languages and cultures. It is the third largest country in the world, about as large as Europe and slightly larger than the United States. China has one of the world’s oldest civilizations, dating back more than 7,000 years. It has a rich tradition of literature, philosophy, and technological invention.

Throughout much of China’s history, the country has been controlled by a series of dynasties led by a succession of emperors. However, by the mid-1800s, the U.S. and many European countries had forced their way into China, establishing “spheres of influence” (areas under foreign control). These foreign intrusions were bitterly resented by many Chinese. A series of rebellions, including the Boxer Rebellion, broke out, causing the country to become more and more chaotic.

In 1911, Chinese Nationalists seized power from the last emperor of the Manchu Dynasty. Sun-Yat-Sen became the first president of the new republic. In the 1920s, the Nationalists under Chiang Kai-shek defeated a series of local warlords who had seized power in some regions. However, a split developed among the Nationalists, with some adopting Karl Marx’s communist ideology. The Chinese Communists sought to lead a revolution of the working class. They fought with the Nationalists, creating an opportunity for Japan to invade the northern region of Manchuria. After World War II ended, the Communists defeated the Nationalists. Under the leadership of Mao Zedong, the Communists established the People’s Republic of China in 1949. Chiang Kai-shek and the remaining Nationalists fled to the island of Taiwan, where they set up a separate government. The Communist Party continues to rule China, although it has permitted private ownership of companies and other economic reforms in recent years.

To further students’ understanding of Chinese history, invite them (in groups of 3–4 students) to research the following questions and then report their findings in a class discussion:

1. Early trade with China occurred via an overland route called the Silk Road. Research the route that was followed and the types of products that were traded.

2. Italian explorer Marco Polo established a shipping route to China in the 13th century and was a guest at the court of Kublai Khan. Research and report on Polo's journeys.
3. Find out more about the "spheres of influence" set up in China by foreign powers.
4. What role did clipper ships such as the *Sea Witch* play in the China trade? What types of products did China import and export?
5. Some people believe that the 21st century will be the Chinese century. What do you think is the basis for this opinion? Why might China fall short of this lofty prediction?

Classroom Activity

1. Divide students into groups of two or three. Have one group research China's early history prior to 2000 B.C. Assign other groups to research various historical periods up to the present, including each of the major dynasties (Shang, Chou, Ch'in, Han, Sui, T'ang, Sung, Yuan, Ming, and Manchu). Students should include information about politics, culture, economy, geographic boundaries, science, technology, and major historical events.
2. Have students develop a timeline of the history of China. Assign each group a section of the timeline in which to summarize major events and influences.

Map/Math Connection

1. Distribute to each student a copy of a blackline map of China without physiographic features, cities, or states labeled. On their blank maps, have students label the following cities: Beijing, Hong Kong, Shanghai, Guangzhou (Canton), Tianjin, Wuhan, Nanjing, Lhasa, and Macao. Have them label the Pacific Ocean as well as the East China, South China, and Yellow Seas. Also have students draw the Huang He (Yellow) and Chang (Yangtze) Rivers. Finally, have students label the locations of neighboring countries, including Russia, Mongolia, North and South Korea, and Taiwan.
2. As a class, review the locations of each map feature. For your own reference, consult the labeled map of China located at the end of this guide.

Home Connection

Imagine you are planning a two-week family vacation to China. Search the newspaper travel section for travel packages and airline rates. Check the business section for currency exchange rates. Contact travel agencies for additional information. Select places to visit (cities, landmarks, cultural events, nature preserves, etc.). Determine the total trip cost, including food, lodging and travel to, from and within China. Make a scrapbook including pictures and descriptions of places you'd like to visit. Write a journal entry or postcard describing one day of your trip.

Team Project Connection

History Team

Newspaper Connection

Locate newspaper articles that pertain to China. Classify these clippings into categories such as social, political, economic, recreational, literature, and arts and humanities.

Week 2 – Getting Ready

Theme: Vision and Motivation

Interdisciplinary Connections: Science, math, history, architecture, geography

Skills: Designing a model, calculating speed, mapping, using a log, research

Key Words: Vision, motivation, clipper ship, visualize

Materials

Classroom Activity: glue, large toothpicks or thin dowels, scissors, flat Styrofoam plates, Styrofoam bowls, wallpaper water trough, electric fan, stopwatch; **Map/Math Connection:** Voyage Route Tracking Map (provided), *Ocean Challenge Live!* Captain's Log

Introducing the Lesson

Ask students to recall a difficult trip that they, friends, or family members have made. Point out that it is easy to dream of making a difficult trip or taking on a challenge, but to actually meet that challenge is a completely different matter. Ask the students to put themselves in the shoes of the *Great American II* crew. What might motivate them to take on such a high-risk adventure as sailing from Hong Kong to New York? Invite students to suggest some rewards (tangible, social, personal) that the *Great American II* crew might visualize. Ask students to predict the kinds of situations the crew might encounter and the fears they might have to overcome while on their journey. What types and quantities of supplies would they need to bring along with them to last over 70 days on board without ever coming to shore? Have students work with a partner first, then share with the class a list of things they would want to pack on their boat.

Classroom Activity

1. Have students research the topic of clipper ships. Some questions to research might include:
 - When were clipper ships first introduced into the sailing industry and how long were they used? (Answer: 1830s–1860s.)
 - Who was Donald McKay? (Answer: A naval architect who built and designed many clipper ships.)
 - What structural designs made clipper ships so swift? (Answer: Slim hull, many sails.)
 - How did some common clipper types, such as California clipper, China clipper, coffee clipper, and tea clipper, differ? (Answer: Each was designed for speed and a specific cargo.)
 - How many crew members were usually on board a clipper ship? (Answer: 25–50 sailors.)
2. Have students study the design of the *Sea Witch* from its picture on the sitesALIVE! website and/or from other resources. Then, group students in teams of 2–4 to design and build a model clipper from toothpicks and Styrofoam plates and bowls. Determine the specifications for students' ship models (including overall length, width, and height) ahead of time so that during the subsequent "clipper" race, the ships compete as evenly as possible. Put a time limit on the design and building process.

3. Have a Clipper Race! Set up the wallpaper water trough as the “race course,” and the electric fan at one end as the “wind.” Be sure, as student teams race their models, that the water level, angle, fan speed and starting and finishing points remain constant. Use the stopwatch to calculate speed per second.
4. Conclude the activity by having a class discussion about the structural differences of the faster and slower clippers.

Map/Math Connection

1. Review the concepts of latitude and longitude. Explain that on a globe or map, lines of latitude are imaginary lines around the Earth that are drawn parallel to the equator. Lines of longitude are imaginary lines running north and south around the Earth. Latitude is measured in degrees north or south of the equator and longitude is measured in degrees east and west of the Prime Meridian. These lines are used, in part, to allow ships at sea to know where they are located.
2. Using the concepts of latitude and longitude and the mathematical skills that accompany them, have students track *Great American II*'s location throughout the voyage. Consult the Captain's Log on a daily basis and plot the boat's position on the Voyage Route Tracking Map according to its latitude and longitude coordinates.

Home Connection

With the help of a parent or other family member, have students plan a three-week-long journey to a remote area where there are no modern conveniences (plumbing facilities, refrigeration, grocery/supply stores, housing/hotels, etc.). Have students select the season in which they plan to visit the area, then make a list of items (food, gear, and personal supplies) that will be necessary for their journey. Have students share their list of “essentials.” How do these compare to what the *Great American II* crew are taking?

Team Project Connection

Nutrition Team

Newspaper Connection

Have students compare and contrast the terms “motivation” and “vision.” Can a person have a vision and no motivation or vice versa? Ask students to read the *Purpose of Ocean Challenge Live!* in the Teacher's Guide Introduction. Next, have students review the “help wanted” section of a newspaper, then write an employment advertisement for an individual who would be qualified to undertake the *Ocean Challenge Live!* project. Compare the students' advertisement with the crew's qualifications, as outlined in their biographies.

Week 3 – Equator Crossing

Theme: Observing Traditions

Interdisciplinary Connections: Geography, math, history

Skills: Brainstorming, classification, research

Key Words: Equator, superstition, tradition, ceremony, cartographer

Materials

Classroom Activity: props for role-playing; **Map/Math Connection:** textbooks or other library resources containing pictures of old maps

Introducing the Lesson

A superstition is a belief that runs counter to what a society holds to be true (e.g., don't walk under a ladder, knock on wood for good luck, etc.). Although superstitions may appear to be irrational, they and the actions/ceremonies that accompany them are still present in modern society.

Historically, sailors have always been quite superstitious. During their voyage, the crew of *Great American II* will follow a well-known ceremony based on superstition when they get to the equator: the equator-crossing ceremony. The purpose of the ceremony is to be blessed by King Neptune, mythical ruler of the oceans. During the ceremony, sailors typically dress oddly or cover themselves in a variety of unpleasant materials (old food, marine mud, etc.) in an effort to “appease” King Neptune and get his blessing to cross the equator and sail on safely. Discuss the concept of superstition and the equator-crossing ceremony with students.

Classroom Activity

1. As an open discussion, have students list on the chalkboard the superstitions that they may know of or follow.
2. Once all superstitions are listed, have students categorize them. In what area are most superstitions focused (e.g., sports, hobbies, family, etc.)? Why do students have these superstitions? Do they serve a purpose? What do students think would happen if they did not do as the superstitions require? What famous people do students know who are superstitious?
3. Once students learn about how the *Great American II* crew conduct their equator-crossing ceremony, have them gather materials from home to dress up and conduct their own ceremony, playing the roles of captain and crew of a ship. Do they think that King Neptune would bless them?

Map/Math Connection

1. Explain that a cartographer is a person who designs and makes maps. Historically, cartographers illustrated the world in the way that it was perceived and understood by them at the time. Some maps were practical navigational maps while others “illuminated” the unknown with pictures of sea monsters and other hazards.
2. Have students look through history textbooks and in library resources to find pictures of old maps (local, regional, and world). Then, ask students to answer the following questions:
 - How did the cartographers’ perceptions of their world differ from what you know to be true today?
 - What can you learn about people by observing the way in which they represent their world?

Home Connection

Families are a place where ceremonies, traditions and superstitions often play an important role. Have students discuss with their families what traditions they follow and why. Are the traditions based in religion? Are they based on “what they have always done?” What is the purpose of the ceremonies, traditions, and superstitions that students’ families observe? What would happen, or how would it feel, if they did not observe these traditions?

Team Project Connection

Navigation Team

Newspaper Connection

Find an article or picture in the newspaper that shows or discusses a ceremony (political, religious, or personal). Why is this particular ceremony important? Write a letter to the editor that describes one of your traditions and why it is important to you.

Week 4 – Environment: Water & Air

Theme: Environmental Resources and Impacts

Interdisciplinary Connections: Science, social studies, geography, language arts, mathematics

Skills: Converting fractions and decimal percents, calculating ratios and proportions, making a model, persuasive writing, graphing, reading maps

Key Words: Environment, pollution, climate, desalinator, ratio, proportion, Likert scale, survey

Materials

Classroom Activity: light source(s) (incandescent lamps), clean glass jars (1 quart or 1 liter), paper cups, saltwater solution, food-grade plastic wrap, rubber bands; **Map/Math Connection:** atlases or globe, meter stick, paper, markers

Introducing the Lesson

Ask students to estimate how much water they use during a day. Help them to come to a reasonable estimate by first defining when they use it (remind them of the hidden uses too: laundry, cooking, lawn care, etc.). Emphasize the importance of fresh water to all life. Explain how fresh water and sea water are resources that we often take for granted, and that we tend not to realize their importance until they are polluted.

The crew has a limited capacity to store water on *Great American II* because of limited space. In addition, if they store too much water, it might add too much weight to the boat and slow it down, preventing the crew from beating *Sea Witch*'s record. Nonetheless, the crew still must use a certain amount of water each day (for drinking, cooking, washing, etc.). So, how do they get enough fresh water? They make fresh water with sea water by putting it through a process called desalinization. Students can use the following process (distillation) to demonstrate one way in which salt can be removed from water. On *Great American II*, the crew uses a reverse osmosis desalinator (a process that is different from distillation), but the end product is the same: fresh water.

Classroom Activity

1. Separate students into teams of 2–3 students each. Give each team a cup of salt water, a large glass jar, plastic wrap and rubber bands. (Alternatively, you could have the whole class work with one jar.)
2. Have each student taste a small drop of the salt solution and then describe what it tastes like.
3. Next, have each team put their salt water into their jars, then place the plastic wrap tightly around the top of the jar and wrap a rubber band around it to seal it well. Make sure that the salt water does not splash onto the plastic.
4. Place a light source near the base of each jar to heat up the water. If no lamps are available, place the jars on a sunny windowsill. Leave the jars overnight, shutting off the light at the end of the day.
5. The next day, have each team carefully remove the rubber bands and plastic from their jar, then taste the water that has condensed on the plastic. Is it salty? If so, is it as salty as the water in the bottom of the jar? If not, why not?

Map/Math Connection

1. Ask students what they know about the ratio of land to water on Earth. Illustrate the point by showing them a globe and asking for estimates in either fractions or percents. Show them a meter stick and point out that centimeters are based on 100, as is percentile, so a meter stick can be used to show a percentage ratio of land to water on the Earth.
2. Have students make meter sticks out of paper, then use markers to color code and label the following facts on their paper meter sticks: approximately 75% of the earth's surface is covered with water; 4% of the 75% is fresh water.
3. Locate the oceans on the world map and order them by size from largest to smallest (Pacific, Atlantic, Indian, and Arctic). Based on 75% of the Earth's surface being covered by water, the area covered by each ocean equals the following percent: Pacific: 46%; Atlantic: 23%; Indian: 20.5%; Arctic: 4%.
4. Have students calculate how much of the world is covered by each ocean and mark it on their meter stick (e.g., Pacific Ocean = $0.46 \times 0.75 = 34.5\% = 34.5$ centimeters on the meter stick. This number represents the percentage of water on the Earth's surface that is covered by the Pacific Ocean.) The leftover percentage represents the seas (e.g., Mediterranean, Black, Caspian, etc.).

Home Connection

Help students develop an environmental survey to use with their parents and other family members. As a class project, collectively develop statements about local environmental issues that can be responded to in a Likert scale, ranging from “strongly agree” to “strongly disagree.” Have students collect, analyze (in the form of histograms, bar graphs or circle graphs), and report the survey data collected from their families. Have students include recommendations from parents about ways to improve and protect the environment.

Team Project Connection

Geography & Environment Team

Newspaper Connection

Editorials are written to capture the reader's attention and evoke an emotional response. Writers make a point and then support the point with factual information. Distribute editorials from local newspapers for students to review, then have students write a guest editorial about water pollution from a point of view related to *Ocean Challenge Live!* For example, they could write a letter from the crew about the evidence of pollution seen along the journey and the consequences to marine life.

Week 5 – Invisible Places

Theme: An Understanding of “Place”

Interdisciplinary Connections: Geography, language arts, social studies, science, math, history

Skills: Using maps, letter writing, using empathy, orienteering (using a compass), research

Key Words: Environment, imagine, empathy, compass

Materials

Classroom Activity: atlases, maps; **Map/Math Connection (for demonstration or for each group):** compass, aluminum pie pan, Styrofoam sheet (2 in²), water, bar magnet, sewing needle, tape, small Post-its (labeled: North 0°, East 90°, South 180°, West 270°); **Newspaper**

Connection: Communications Team Project Guide (provided)

Introducing the Lesson

Ask students if they recall a time when they were away from home for a week or longer without friends or family (e.g., going away to camp or school). Invite them to share their thoughts with a partner and develop a list of some of the things they missed (or imagine they would miss if they were in such a situation). Then, as a class, develop a combined master list of things students would miss in such a situation.

Point out that the *Great American II* crew has been away from home and family for five weeks. What are some of the same “creature comforts” and family activities they have probably missed? How might the crew have used their memories of friends and family to comfort their loneliness? Talk about the meaning of empathy (i.e., imagining what someone else is feeling, thinking, or experiencing; putting yourself in someone else’s place and trying to feel his or her feelings inside yourself). Suggest that students write empathetic and encouraging letters to the crew.

Classroom Activity

1. Remind students that the *Great American II* crew hasn’t seen land for five weeks. Invite them to download maps from *Ocean Challenge Live!* of the crew’s journey from Hong Kong to this point. In addition, obtain atlases or maps showing landmasses bordering the route, and have students identify the major countries the crew has passed but not seen.
2. Divide students into small groups and assign each group one of the countries to research. Have students find out about the country’s geography, economy, climate, commercial interests, society, and culture.
3. Have groups do oral reports or brief Powerpoint presentations about the land and people they studied. Guide students to write letters to the crew about what they have learned.

Map/Math Connection

1. Explain that early navigators used floating compasses to determine direction and to maintain the course of their ships. Elicit what mechanisms the earliest mariners used to navigate prior to the invention of the magnetic compass (i.e., they sailed close to shorelines and used telescopes if they went too far off shore).
2. The earliest compasses were invented by the Chinese in the 12th century. The use of floating compasses was prevalent in European navigation by the 15th century. Guide students to make a floating compass model similar to those used in early navigation, following the steps below:
 - Pour water a centimeter deep in an aluminum pie pan.
 - Next, cut a Styrofoam square 2 inches on each side.
 - Magnetize a sewing needle by stroking the needle point several times against the north pole of a bar magnet. Each stroke must be in one direction only.
 - Tape the magnetized needle diagonally onto the piece of foam, and then float it gently in the center of the pan.
 - On the pan, label the direction that the needle points “North 0°.” Label the corresponding major compass points (East 90°, South 180°, West 270°) around the edge of the pan. You may also wish to add NE, NW, SW, and SE. Use a standard compass to check for accuracy. If it does not correspond, see if other metallic objects are interacting with the magnetized needle.

Home Connection

Have students work with their parents to determine what information they would want to share with other peoples to create an understanding of what makes the students’ country “home.”

Team Project Connection

Energy & Mechanics Team

Newspaper Connection

Use the Communications Team Project Guide as a class project. Have students search the newspaper to identify news of interest to the *Great American II* crew, and write a news digest for the boat. Organize the project so that students work in teams on different sections of the newspaper.

Week 6 – Midpoint

Theme: Turning Points

Interdisciplinary Connections: Geography, art, technology, language arts

Skills: Using perspective, predicting, drawing (maps), research

Key Words: Midpoint, perspective, desalinator, dehydrated food, communications systems

Materials

Classroom Activity: *Ocean Challenge Live!* Captain’s Log and Journals; **Map/Math**

Connection: Voyage Route Tracking Map (provided), paper, markers or crayons

Introducing the Lesson

Point out to students that at the midpoint in a journey or challenging experience, people can plan ahead with two different perspectives. They can look back and think of things they would have done differently, or they can look ahead and think of ways they will act differently based on what they have learned during the first part of their journey. Form discussion groups to talk about what students might do differently at this point of the school year based on experiences they have had so far. Collectively share the information in a full-class discussion.

Classroom Activity

1. Organize students into teams. Have each team use the *Ocean Challenge Live!* Captain’s Log and Journals to assess the status of the voyage thus far.
2. Have students identify specific voyage achievements as well as challenges, and predict whether *Great American II* will break *Sea Witch*’s sailing record. Make sure that teams explain the reasoning behind their predictions.
3. Ask each team to list and evaluate the decisions the *Great American II* crew have made, determining which decisions were “wrong” or “right,” depending on the result. What determines whether the crew made a good decision or not?

Map/Math Connection

1. Ask students to turn the Voyage Route Tracking Map upside down (i.e., north at the bottom) and view it from that perspective. Ask students if they notice anything different about the route or have different predictions about the next weeks when they see the map from that perspective.
2. Point out that there is no reason why we always put north at the top of maps. Ask students how people would use a compass if, instead of having north as the top of maps, they used south, east, or west as the top.
3. To encourage students to think anew about maps and geography, have them put away the Voyage Route Tracking Map, then draw their own map of the route that the boat will follow for the remainder of the voyage. Have students exchange their maps with their peers, then determine as a group which student’s map has the most accurate detail.

Home Connection

Have students interview their parents, grandparents and/or other family members to find out about turning points in their family history. What did they learn from these turning points that helped them to make future decisions? Did they move ahead in different directions or ways? Why or why not?

Team Project Connection

Information Team

Newspaper Connection

Have students search the newspaper for examples of individuals or organizations at a turning point. This could be a sports team, a business that has just issued a quarterly report, or a politician who is just beginning his term in government. Ask the students to imagine themselves from the individual or organization's perspective in the same situation. What kinds of things would the people who are at the turning point have to think about from their earlier experience? What goals might they set or change? What kinds of things might they plan ahead for based on that experience? How might they evaluate their success?

Week 7 – Decision-Making

Theme: Making Decisions

Interdisciplinary Connections: Geography, math, science, history

Skills: Making decisions, reading maps, collecting data

Key Words: Route, decision, alternative, prevailing winds, aneroid barometer, barometric pressure, millibars

Materials

Classroom Activity: *Ocean Challenge Live!* Captain’s Log and Ship Position, world atlas, Voyage Route Tracking Map (provided), paper, writing utensils, world history books;

Map/Math Connection: aneroid barometer (optional)

Introducing the Lesson

Point out that daily—in fact hourly—the *Great American II* crew must make decisions about which is the best route to take based on wind, weather, sea conditions, and destination. Ask students if they have ever taken a route that was longer than another route but safer or different in some way. Ask them to explain why they chose to take the longer route. Display the following decision-making steps on a chalkboard, bulletin board or overhead projector. Refer to them as students explain their decisions to change routes:

1. What was the problem or decision to be made?
2. What information (facts that created the problem) did students have?
3. What were the alternative solutions?
4. What were the consequences to each alternative solution?
5. Which seemed to be the best choice and why?
6. Which solution did students choose? Was that the best choice? If it was not, how did they deal with the consequences?

Classroom Activity

1. As a class, look at the map that you are using to track the *Great American II* crew’s progress. Ask students to analyze the *Ocean Challenge Live!* Ship Position and Captain’s Log pages to find instances in which the crew have changed their route or course.
2. Have students make a two-column chart on a piece of paper. In one column, ask them to list reasons why the crew might choose a certain route. In the other column, have them list reasons why the crew might avoid a certain route. For example, the crew might choose a route that has consistent prevailing winds and avoid a route that has a lot of storms. Students should base their lists on information gained from the *Ocean Challenge Live!* online materials.
3. Have students contrast the route the *Great American II* is taking with the *Sea Witch*’s route. As a class, discuss why the *Great American II* may have chosen the route taken thus far. Further, discuss the decisions the captain of the *Sea Witch*, Robert “Bully” Waterman, may have made to achieve speed over safety.
4. Encourage students to study other nautical voyagers, such as Captain Bligh, sailing the *Bounty* to Tahiti in the late 1780s. Other famous voyagers include Charles Darwin, Christopher Columbus, Henry the Navigator and Ferdinand Magellan.

Map/Math Connection

1. Elicit from students why air pressure changes. (Answer: It is caused by changes in air density and elevation.) Explain that detecting and measuring changes in air pressure is useful in predicting weather changes (which in turn can determine whether a ship's captain changes the course of his ship). Areas of high pressure generally bring clear skies and fair weather. Areas of low pressure bring clouds and precipitation.
2. Show students a barometer (optional) and explain that it is an instrument used to measure air pressure, often called barometric pressure. Point out that as temperature rises or elevation increases, the air becomes less dense. Thus, the pressure decreases. As the temperature drops or elevation decreases, the air becomes more dense and the air pressure increases. An aneroid barometer is a tool that responds to and measures air pressure. The *millibar* is a unit of pressure that is related to the actual weight of air pressing on a square centimeter. *Inches of mercury (in Hg)* is another common unit of measure for air pressure.
3. As the pressure increases or decreases at sea level, the *Great American II* crew use their barometer to predict changes in weather. Invite the Weather Team to present the air pressure data over the past week to determine if the barometric pressure reading was a good predictor of weather conditions and changes.
4. Have students collect barometric pressure readings for the next two weeks and use the data to predict weather changes.

Home Connection

With their parents' help, have students examine a map that they have used to go on a vacation or to visit a friend or relative, then plan several different routes that could take them to the same place. Discuss and record the advantages and disadvantages of each route, then ask parents to discuss why they chose to follow a certain route. Invite students to share their family discussion and map with the class.

Team Project Connection

Weather Team (Invite this team to share information about the ship's air pressure data in the Map/Math Connection activity.)

Newspaper Connection

Have students find examples of decision-making in the paper. Ask each student to find a person whose decision has been reported in the newspaper. Include cartoon characters, if desired. Encourage students to go through the decision-making method suggested in *Introducing the Lesson*. Ask students to identify the factors that affected the choice that person made. Was the outcome what the decision-maker anticipated?

Week 8 – Wildlife

Theme: Adaptation & Interconnectedness

Interdisciplinary Connections: Science, geography, math

Skills: Brainstorming, graphing, identifying cause and effect, calculating, research

Key Words: Surface zone, algae, food web, habitat, neritic zone, continental shelf, adaptation, predator, prey, camouflage, animal population

Materials

Classroom Activity: a variety of colored paper clips, toothpicks, or other small objects of various colors, solid colored paper sheets, paper clip containers, graph paper, colored pencils or markers, stopwatch; **Map/Math Connection:** *Ocean Challenge Live!* Captain’s Log

Introducing the Lesson

Have students recall various examples of animal life that have been reported by the *Great American II* crew. Many of the most commonly seen marine species are those that either float on the surface, like sea turtles, or jump out of the water, like flying fish or dolphins. These species live in the top layer of the open ocean, a layer known as the surface zone. The surface zone extends to the depth that sunlight reaches, typically less than 200 meters. Most ocean life can be found in this zone because algae, the basis of the ocean food web, requires sunlight to grow.

Along the voyage, the ship will be passing near parts of Africa, South America, and Asia, all of which contain rich land animal habitats. Have students work in groups to research land and marine habitats along the ship’s route (e.g., the Amazon and Indonesian rainforests; the African plains and deserts; mountains such as Mount Kilimanjaro and the Andes range; beaches; and ocean habitats such as the neritic zone over the continental shelf and the surface ocean zone).

Have students use the following questions to guide their research:

- What are the physical characteristics of the habitat? What are some of the major animal species that live within it?
- What does the local food web look like? Which species are predators and which are prey?
- Find pictures of some animals in the habitat and point out their adaptations. What types of adaptations do these animals have and how do these adaptations help the animals to survive within their habitat? How might these adaptations have originated?
- Find an example of a particular form of adaptation: camouflage. How does camouflage aid an animal’s survival?

Classroom Activity

-
1. Organize students into cooperative groups, then have each group scatter a set of approximately 50 colored paper clips or similar objects on a solid colored sheet of paper. Each paper clip represents prey, with the students playing the role of predators. The sheet should be similar in color to one of the paper clip colors, so that they blend in with the sheet.
 2. Once all clips are in place, have groups switch positions so that each group has a different sheet. Have one student in each group act as the “catcher” and another as the “counter.” Tell the “catchers” that they can “catch” only one paper clip at a time and may not pick up the sheet. Once a clip is caught, it is handed to the “counter” to be tabulated later. Give each

group sufficient time (about 45–60 seconds) to collect about half of the clips sprinkled on the sheet.

3. Once collecting is complete, have each group sort their collected clips by color and make a bar graph of the results.
4. Have students answer the following questions, using their bar graphs for reference.
 - a. Who was the predator in this activity? What was the prey?
 - b. Which color paper clips were found most easily? Which were most difficult to find?
 - c. What does this activity have to do with animal camouflage?
 - d. Suppose that the paper clips were a population of real animals of all different colors to begin with. How would the color mix of this population likely change over time because of predation? Explain.
 - e. If the color of the background sheet were changed, how might this affect the results?
 - f. How do predators adapt to find well-camouflaged prey?
 - g. What does this activity reveal about how adaptations appear in animal populations?

Map/Math Connection

1. Explain to students that, on the ocean, distances are measured in *nautical miles*, while on land, distances are measured in *statute miles*. The value of a nautical mile is based on the length of one minute of arc on Earth and is also equal to 1.15 statute miles. A *knot* is a unit measure for speed, equal to one nautical mile per hour.
2. Go to the *Ocean Challenge Live! Captain's Log*. Find out how many nautical miles *Great American II* has traveled since it left Hong Kong. Based on the number of days the ship has traveled, what is the average number of nautical miles per day the ship has traveled? Make the same calculation to determine the ship's speed in knots.
3. Calculate the distance covered by and the average speed of *Great American II* over the next week. Can you find any relationship between the boat's speed and other information provided in the Captain's Log?

Home Connection

In an earlier voyage on the *Great American II*, Rich Wilson was awed by the connectedness of the ocean's action. "Every salty wave from San Francisco to Boston was connected to the next, and to every harbor, beach and river he passed." To demonstrate the concept of interconnectedness, have students talk with their families about how events, actions, and decisions that occur within the family can have an effect on other family members. How can students' own decisions affect their families and others who care for them? Invite students to share their family discussion.

Team Project Connection

Marine Life Team

Newspaper Connection

The environment is frequently in the news. Have students find newspaper articles that identify problems relating to the environment. Have each group present one problem to the class, then have the class brainstorm possible solutions for the problem.

Week 9 – Teamwork & Perseverance

Theme: The Team’s Commitment

Interdisciplinary Connections: History, science, geography, language arts

Skills: Making decisions, collaborating, showing respect, research

Key Words: Cooperation, challenge, commitment, perseverance, decision, tolerance, motivation

Materials

Classroom Activity & Map/Math Connection: *Ocean Challenge Live!* online materials

Introducing the Lesson

Ask students to recall a situation in which they, with another person or group, kept working toward a goal, even though it was a difficult goal to achieve. This might have been a team sporting competition, a school or community project, or a family challenge. Ask why the four elements—*cooperation, tolerance, commitment, and perseverance*—are important to the success of a project or challenge. [Note: This could be more effectively done in a Think, Pair, Share format in which students first *think* and respond in writing to suggested questions; *pair* with another student to discuss responses; then *share* their responses to the class.] Point out that personal motivation and a commitment to achieving the goal is the reason members of the *Great American II* crew persist.

Discuss interpersonal problems that might occur between the *Great American II* crew members after being together for nine weeks, 24 hours a day, in spite of their commitment. What are some constructive ways they could handle their disagreements? Suppose their extended team (Boston-based communications team, weather service team, family and friends) did not share the cooperation, tolerance, commitment, and perseverance that the crew share. How might this put the crew at risk?

Classroom Activity

-
1. Have students review and share the information they have learned and gathered so far about the trip. What are some of the challenges the *Great American II* crew have faced? How did the crew persist to meet the challenges?
 2. Encourage students to identify some problem-solving events in the voyage, then evaluate the *Great American II* crew’s decisions about them. As a class, create a list of the lessons the crew may have learned from their decisions.

Map/Math Connection

1. Have students predict challenges that the crew might face during the next few weeks based on their current location and the weather along their voyage's route.
2. Estimate the time at which the crew will encounter these challenges. Contrast the things that will be *out of their control* with those that will be *in their control*. How can the crew accept or deal with things that are out of their control?
3. Find out about the near catastrophe Rich Wilson experienced in his first attempt to sail from San Francisco to Boston, USA, on the *Great American*. Information about this attempt can be found in the *Ocean Challenge/Racing a Ghost Ship Archives* on the sitesALIVE! website.

Home Connection

Have students interview their parents, grandparents, or other adult family members to find out about the daily challenges they face. These could be health, economy, work or family-related. How do they overcome these challenges? Are *cooperation, tolerance, commitment, and perseverance* a part of their solutions to problems?

Team Project Connection

Teamwork Team

Newspaper Connection

Have students look in the sports section (or sections containing other potentially high-risk events) for examples of decision-making that led to a loss. Ask them to imagine (or role-play) the dialogue that took place before each decision. Invite students to imagine or stage the dialogue that took place after the decision that led to the loss. If the role-play involves a sporting-event loss, discuss how using good sportsmanship might help the team.

Week 10 – Forces of Nature

Theme: Natural Forces

Interdisciplinary Connections: Science, geography

Skills: Collaborating, mapping, research

Key Words: Ocean wave, wind, current, typhoon, tsunami, volcano, earthquake, global wind, Coriolis effect, hurricane, tornado, latitude, longitude, Ring of Fire, tectonic plate

Materials

Classroom Activity: world map of ocean currents, Voyage Route Tracking Map (provided);

Map/Math Connection: world map with lines of latitude and longitude (you can use the Voyage Route Tracking Map, if you prefer), list of earthquakes and/or volcanoes with locations

Introducing the Lesson

On their small boat, the *Great American II* crew are to a great extent at the mercy of the forces of nature. Their boat is buffeted by waves and blown about by strong winds. Some of these forces, such as winds and ocean currents, are fairly predictable. Other forces, such as major storms, are not as predictable (at least, not without the help of specialized meteorologists). On the voyage, the boat will be passing near locations where extreme displays of natural forces have appeared in the past. These include the sites of several major volcanic eruptions. Tambora (1815) and Krakatoa (1883), both in Indonesia, are the two deadliest known volcanic eruptions in history. Besides volcanoes, earthquakes are also fairly common in this region of Southeast Asia.

Invite students groups (3–4 students per group) to research the following questions and then report their findings to the class:

1. What are global winds? How will these help or hinder the voyage?
2. What causes currents? What affect do they have on climate?
3. What is the Coriolis effect? How does it affect global wind patterns and currents?
4. How do tsunamis develop? How large can they become? How common are they? How do they affect ocean ships as they pass by?
5. What are the three major types of volcanoes? How are they different? What volcanoes will the boat be passing near?
6. What causes earthquakes? Can they be predicted? Where do they occur?
7. How and where do hurricanes (called typhoons in the Pacific) develop? Is the boat likely to face such storms? What happens to hurricanes once they reach land?
8. What are tornadoes? Can they occur over the ocean?

Classroom Activity

1. Have students examine a map of ocean surface currents. Have them look for patterns in the direction of these currents. They should notice that major currents rotate to the right (clockwise) in the Northern Hemisphere and to the left (counterclockwise) in the Southern Hemisphere. They should also notice that currents tend to flow along the coasts of continents.
2. Have students compare the ocean current map to the Voyage Route Tracking Map. In which areas did the ocean currents move in the same direction as the boat traveled? In which areas did the boat sail against prevailing currents? How do you think the direction of currents affects the speed at which a boat moves? Does the *Great American II*'s route make sense in light of the currents? If the crew has to sail against the current at times, how might they accomplish this?

Map/Math Connection

1. Obtain a list of 20–30 major earthquakes or volcanoes, together with their locations (latitude and longitude), then have students plot them on a world map.
2. When done, ask students to study their maps. Do they see any patterns in the plotted earthquakes and volcanoes?
3. As a class, discuss the geographic patterns of earthquakes and volcanoes. For example, most earthquakes and volcanoes tend to cluster together, especially around the rim of the Pacific Ocean, an area called the “Ring of Fire.” This is because the Earth’s crust and upper mantle are divided into a series of tectonic plates, which slowly slide horizontally along the surface. Most major earthquakes and volcanoes are found near where such plates meet.

Home Connection

Lead a discussion on earthquake safety. Inform students about proper actions to take in the event of an earthquake, such as taking cover under a desk, table, or doorway. Have students discuss with family members how they could make their home safer before an earthquake occurs. Have them conduct an earthquake hazard hunt in their home, then make any changes (such as moving or fastening down heavy objects that could fall during an earthquake) that the family decides are appropriate.

Team Project Connection

No team presentation this week. Use extra time as a “catch-up” period.

Newspaper Connection

Search the national and world news sections of the newspaper to find articles describing events caused by forces of nature. Possible examples include hurricanes, blizzards, tornadoes, floods, earthquakes, and volcanic eruptions. Locate each of these events on a world map.

Week 11 – What We'll Miss

Theme: Perspective

Interdisciplinary Connections: Math, geography, language arts

Skills: Graphing, map reading, averaging, narrative writing

Key Words: Perspective, challenge, lesson, narrative

Materials

Classroom Activity & Map/Math Connection: *Ocean Challenge Live!* Captain's Log;

Map/Math Connection: world atlas, Voyage Route Tracking Map (provided)

Introducing the Lesson

Organize students into their project teams. Have each team list the most important events of the voyage, then prioritize the list and determine which are the top two most significant events. Have each team report to the class on why they chose those particular events as most significant. Finally, have the class vote on the two most significant events, then display the results on a bar graph (based on which events were voted for and how many times they were voted for).

Classroom Activity

1. As a class, discuss how perspectives change after people experience an exciting or high-risk event. In what ways might the *Great American II* crew have a different perspective now that they have almost finished their trip and reached their goal?
2. Have students review the Captain's Log to determine what lessons the crew may have learned during the trip. Have students predict which lessons Rich Wilson will relate vs. which lessons Rich du Moulin will identify upon landing.

Map/Math Connection

1. Use the *Ocean Challenge Live!* Captain's Log to determine the distance sailed so far and the distance remaining. Have students predict whether the crew will beat *Sea Witch*'s record of 74 days, 14 hours.
2. Have students calculate the hourly rate at which *Great American II* has traveled in the past week. Study the remaining distance that the boat needs to travel to New York City, and predict the actual day and hour that *Great American II* will arrive. Create a contest to see whose prediction is the most accurate one.

Home Connection

Survey family members about their choices of the most significant events of the voyage. Find out if parents agree with students' choices of significant events. Collect and compare parent data with class data. Find out how (if at all) parents' perspectives differ from students' perspectives. Why do you think a difference exists?

Team Project Connection

Communications Team

Newspaper Connection

Explain that a narrative is a way of telling the story of an event from beginning to end. A good narrative:

- captures the reader's attention in the introduction
- follows a logical sequence of events
- evokes an emotional response from the reader
- provides the reader with new information or a unique perspective on old information
- employs an appropriate tone or voice for the subject

Have students find narratives in the newspaper (e.g., in the features or op-ed sections), then ask them what they noticed about the kinds of information the reporter included. Have students write a narrative of some of the exciting events that have occurred so far during *Great American II*'s journey. They may divide the narrative into parts and write the complete event as a team. Instruct students to write their narratives in one of the newspaper writing styles they have encountered.

Week 12 – Defining Success

Theme: Defining Success

Interdisciplinary Connections: Geography, art, math, language arts, humanities

Skills: Mapping, drama, creative expression, setting goals, planning, making decisions, writing

Key Words: Success, skills, achievement, resilient, procrastinate, self-esteem

Materials

Map/Math Connection: Voyage Route Tracking Map (provided), large sheets of paper or posterboard, markers, crayons, pens or pencils

Introducing the Lesson

Have students review their notes about the journey. Remind them that at the beginning of the voyage there was no guarantee that the *Great American II* crew would achieve their goal. Have students define success (what does success mean to them?). Did the crew break *Sea Witch*'s record? If so, was their success limited to breaking the record? If not, could their voyage still be considered successful? As they review online materials, have students document and describe any instances that they would qualify as successful. What lessons were learned from mishaps or failures? Ask students what factors they think were most important in enabling the *Great American II* crew to succeed and get to their destination.

Classroom Activity

1. First, have students identify people they believe are successful. These people might include classmates, teachers, family members, sports figures, politicians, etc.
2. Next, ask students: What are some actions or qualities a person needs to do/have to be successful? Some possible answers might include: being responsible, setting realistic goals, devising a plan to reach goals, managing time, being committed, and remaining resilient. Point out that goals need to be challenging but realistic.
3. Have students discuss some of the pitfalls that hamper achieving success, such as procrastination, fear of failure, and poor planning. Write the term resilient on the chalkboard. Elicit a definition and examples of resiliency. Stress that being resilient means being able to recover from an event that could be disappointing or catastrophic.
4. As a class, discuss how some of the following things can help a person define and achieve success for themselves:
 - a. make a checklist and check off the smaller steps as they are achieved
 - b. reward oneself when a goal has been achieved
 - c. ask for help when it is needed
 - d. find someone who has a similar goal and exchange encouragement, ideas, and lessons learned
 - e. once the goal is accomplished, reflect on the processes that were most important to success
5. Discuss the actions/qualities that the *Great American II* crew demonstrated in setting and achieving their goal. How do students think that the crew used the five suggestions to achieve their goal?

Map/Math Connection

1. Have students make a large annotated route map, using the Voyage Route Tracking Map for reference.
2. Have students write “headlines” at specific locations along the route where significant events occurred.

Home Connection

Have students make a scrapbook of the materials they produced during the voyage. It may be based on events, chronology, etc. Include photos, quotes, and captions downloaded from *Ocean Challenge Live!* on the sitesALIVE! website. Encourage students to focus on a theme such as teamwork, success, marine life, decision-making, record-breaking, etc.

Team Project Connection

The Book & Movie Team can act out the final scene of their film. Have a member of each of the other Team Projects present their own brief summary of the voyage from their particular perspective.

Newspaper Connection

Have students look through the newspaper for examples of people who have overcome challenges. Was the challenge mental, physical, emotional, or social? How did overcoming the challenge affect the person and those who cared about him or her? Are there any comparisons that can be made between how the person overcame his or her challenge and how the *Great American II* crew overcame theirs? Ask students to read the newspaper articles carefully to identify factors that have enabled the described individual to succeed.

Special Final Newspaper Project

Have students prepare a “Special Edition” newspaper to celebrate the completion of the *Great American II*'s journey and their own work. The Special Edition should include the following components:

- **Front Page:** Headline and main feature story. Students could add in related “side-bar” articles, including quotes from the daily audio updates or interviews with members of the class who have become “experts” about specific aspects of the journey.
- **Features:** Articles about different aspects of the journey. Each team could submit an article relating to the focus of their team project.
- **Perspectives:** Editorials and an editorial cartoon about the meaning and/or purpose of *Ocean Challenge Live!*.
- **Challenge:** Math problems, science connections, or trivia questions based on materials generated during the voyage. For example, a crossword puzzle could be developed focusing on nautical terms used in *Ocean Challenge Live!*.

History Team Project Guide

Your challenge is to research the histories of the countries along the route that *Great American II* sails. For your sources, use world history textbooks, encyclopedias, the sitesALIVE! website, CD-ROMs, etc.

1. Start by researching and summarizing the voyages of some famous sailors who have challenged the ocean. Include information on the following:
 - a. Hernando de Soto
 - b. Hernán Cortés
 - c. Vasco Nuñez de Balboa
 - d. Juan Ponce de León
 - e. Christopher Columbus
 - f. Captain James Cook

2. Find out about the history of commerce and trade routes in the regions through which *Great American II* will pass.

3. For each country along the way, make a “History Connections” digest. Include information about explorers and navigators who have met challenges in that country. Follow this outline in your reports:
 - a. Country:
 - b. Explorer/Navigator:
 - c. Challenge the person faced there:
 - d. How that person met the challenge:
 - e. Connections to *Ocean Challenge Live!*:
 - f. How does the explorer’s challenge compare to that of the *Great American II* crew?
 - g. What advice might this explorer have for the sailors on *Great American II*?

Added Challenge

How is traveling in space like traveling on *Great American II*? What lessons might the sailors on *Great American II* have for future travelers in outer space?

Nutrition & Health Team Project Guide

Your challenge is to learn about and report on the food, water, medical, and sleep needs of *Great American II*'s crew.

- 1. Prepare for Your Job:** Interview a coach, athlete, nurse, doctor, or nutritionist to find answers to the following questions:
 - a. How many daily calories does a person doing hard physical labor 12 hours per day need to consume?
 - b. What foods are high in energy?
 - c. How much water does an adult under a lot of physical strain need each day?
 - d. Rich Wilson has had severe asthma since childhood. What is asthma? What special medical needs or concerns does a person with asthma have?
 - e. What kinds of medical supplies should people take on a long, non-stop ocean voyage?
 - f. How many hours of sleep should each crew member get during a 24-hour period? Since the crew members will be on alternating watches, how long should their watches be to allow each of them to get enough consecutive hours of sleep?
 - g. What other advice does the health expert have for two sailors on such a trip?
- 2. Recommend Foods:** Make a list of the kinds of foods that the *Great American II* crew should take along. Remember there is no refrigerator on the boat.
- 3. Food Consumption:** Design a balanced and practical menu that will provide the necessary calories and nutrients for the *Great American II* crew during a 24-hour period.
- 4. Water Consumption:** The *Great American II* crew get fresh drinking water from the ocean salt water by using a machine called a desalinator. Figure out how much drinking water the crew will have to make each day.
- 5. Pack the Medicine Chest:** Make a list of the supplies that the *Great American II* crew should be sure to pack to provide for their health and medical needs.

Added Challenge

Find out how the crew's nutritional and calorie needs will change as they travel through different climates. Make a calorie chart of foods you think the *Great American II* crew should eat.

Navigation Team Project Guide

Your challenge is to create a Location Report. Use the chart below to weekly record the position (location) of the boat and its distance to the nearest landmass. In addition, predict the boat's position one week from the current report and calculate the average weekly distance traveled.

Week	Latitude Longitude	Distance/Direction to Nearest Land	Average Weekly Distance	Predicted Position for Next Week
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				

Added Challenge

Your predictions should improve each week as you learn more about the voyage. What kinds of things help you to make better predictions about the location of the boat? Calculate the average speed *Great American II* must travel to break *Sea Witch*'s record of 74 days, 14 hours. The total distance is approximately 15,000 miles.

Geography & Environment Team Project Guide

Your challenge is to describe the countries and global regions that *Great American II* is passing, and the environmental issues facing these regions.

Week	Nearest Country/Region	Description of the Region	Environmental Issues of the Region
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			

Added Challenge

Research one environmental issue further to see if the problem exists in other parts of the world.

Energy & Mechanics Team Project Guide

Your challenge is to both research the basic physical setup of the boat and monitor the use of energy during the trip.

1. **The Physics of a Trimaran:** What is a trimaran and why is it built the way it is? To answer these questions, you need a picture of such a boat (found on the sitesALIVE! website), a list of its parts, and an understanding of sailing. You may also find information about trimarans and other sailing vessels from the essays, journals, and questions and answers on the website.
 - a. To find out further about sailboats, there are several options:
 - Call a boat dealer if you have one in your area. If you cannot find a boat dealer, then contact a boat manufacturer. How will you find such a business? Use the yellow pages from a seaport such as New York, Boston, etc.
 - Get a model of a sailboat from a hobby store and put it together. In this way, you will get to know the parts of a sailboat firsthand.
 - Conduct an interview with someone who has sailed a boat.
 - b. To report your information, create a key for a picture of a trimaran. For each labeled part, tell how it works and why it is important to the boat (Hint: you can use the boat diagrams on the sitesALIVE! website).
 - c. Find out and list the advantages and disadvantages of sailing monohulls (boats with one hull) and multihulls (boats with more than one hull, e.g., a trimaran).
 - d. Make a list of tools that should be included in an onboard toolbox to keep the sailboat in good repair. Remember that there is a limit on space and weight on board.
2. **Energy Advisors:** It is your job to give the team advice on their use of electricity. First, research the variety and amount of equipment presently aboard *Great American II* (listed on the sitesALIVE! website). Then, contact your local electric company for information about the use of electrical power for this equipment.
 - a. Make a list of the equipment on the boat that will require electricity.
 - b. Make a general list of suggested ways that the *Great American II* crew can conserve electricity.
 - c. Make a list of ways the boat generates electricity (using the sun, wind, and boat's engine), and then find out more about these three methods of getting energy.
 - d. Keep a voyage energy log, using the table on the following page. Note any problems that cause the crew to use extra energy.

Energy & Mechanics Team Project Guide

Week	Extra Energy Use	How serious is the extra use?	Your advice to the crew about this situation
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			

Added Challenge

Set up an experiment in the classroom to determine how long different voltage batteries will power a light, and graph the results.

Information Team Project Guide

Your challenge is to update the following chart weekly. You can set up the chart on a bulletin board, if you prefer.

Week	Focus of Weekly Report	Significant Happenings from Daily Audio Updates	Special Events and Info
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			

Added Challenge

At the end of the trip, decide which week was the most challenging.

Weather Team Project Guide

As the “official” weather forecasting bureau, your challenge is to complete this chart and determine how the weather has affected the crew’s progress as the trip proceeds. You can base your predictions on climate information available in an atlas. Each week, compare your predictions to actual weather conditions reported in the *Ocean Challenge Live!* Captain’s Log.

Week		Air Temperature	Sea Temperature	Wind Speed/ Direction	Rainfall
1	Prediction				
	Actual				
2	Prediction				
	Actual				
3	Prediction				
	Actual				
4	Prediction				
	Actual				
5	Prediction				
	Actual				
6	Prediction				
	Actual				
7	Prediction				
	Actual				
8	Prediction				
	Actual				
9	Prediction				
	Actual				
10	Prediction				
	Actual				
11	Prediction				
	Actual				
12	Prediction				
	Actual				

Added Challenge

Which week was the best for weather, and why? Which week was the worst for weather, and why? Research and report on these topics: magnetic vs. true north; ocean currents; trade winds; barometric pressure; high and low pressure systems; icebergs; and hurricanes.

Communications Team Project Guide

Your challenge is both to find out about the radio and satellite communications used on *Great American II* and to keep the *Great American II* crew updated on what is going on in the world.

1. Research and report to the class on radio and satellite communications. Explain how various radio and satellite communications work and what the advantages are of each. Include the frequencies used and compare them with television, AM, and FM radio frequencies.
2. Create a weekly news digest to send to the crew. Your job is challenging because you can send only short messages, similar to telegrams. To practice this skill, read the news digest or world briefs section of the newspaper. Use the following questions to help you gather and organize information before writing your news piece.

- a. What part of the news will you follow? Each member of the Communications Team should choose a different type of news to report about.

Team Member	News to Report

- b. Read the newspaper and choose the most important story in your news area. Next, write a brief report that relates the story in *20 words or less*.

NEWS TOPIC:

MY TWENTY WORDS:

- c. Check your story with another member of the team. Be sure that you have told the story clearly and within the word count.

Added Challenge

Translate your news into pictograms or another language.

Book & Movie Team Project Guide

Your challenge is to write a story of the voyage. This story will then be used to create both a book and a movie or play. You may be assigned to write your story about one week, a few weeks, or the whole voyage.

Writing the Book

1. Start with this important step: outline the story of the *Great American II*'s voyage.
2. Decide if you will use any special features. For example, you may decide to include maps and charts.
3. Research how reporters tell stories. Read at least three newspaper articles about events. Discuss the following questions, then make a list of "Tips for Good Writers" based on what you learn from the discussion.
 - a. How does the writer keep the reader interested?
 - b. How does the writer work facts into the story?
 - c. How does the writer begin the story?
 - d. How does the writer end the story?
 - e. What else do you notice about the way the story is written?
4. Write a story of the voyage using your Tips for Good Writers as a guide. You can divide the writing into chapters, with each team member responsible for one chapter.

Book & Movie Team Project Guide

Planning the Movie

Now that you have written a book telling the story of *Great American II*'s voyage, plan a movie or play based on the same story. In order to do this, you must first write the scenario: a list of the scenes in the film. Use the table below to guide your work on each scene. Outline each additional scene in a similar fashion on a separate piece of paper. Be sure to include answers to the following questions:

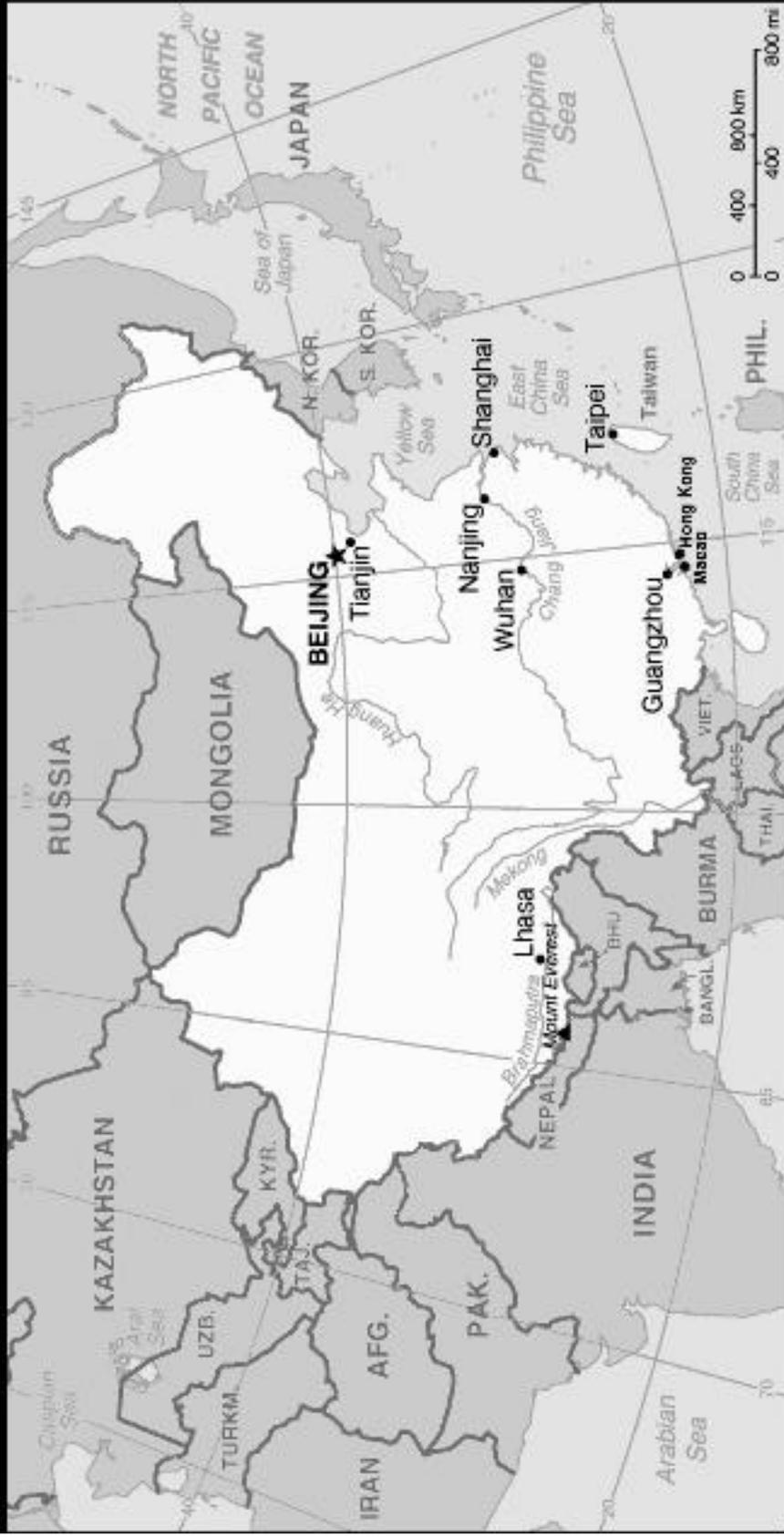
- 1. Music:** What music (if any) will you include in this scene?
- 2. Actors:** Who should play the characters in this scene? (You can cast male or female actors for the roles.)
- 3. Dialogue:** What should each character in this scene say?

Scene # 1		
Situation (problem or event)		Actions Taken
Scene Characters	Played by...	Music (if any)
Actor/Character	Dialogue	

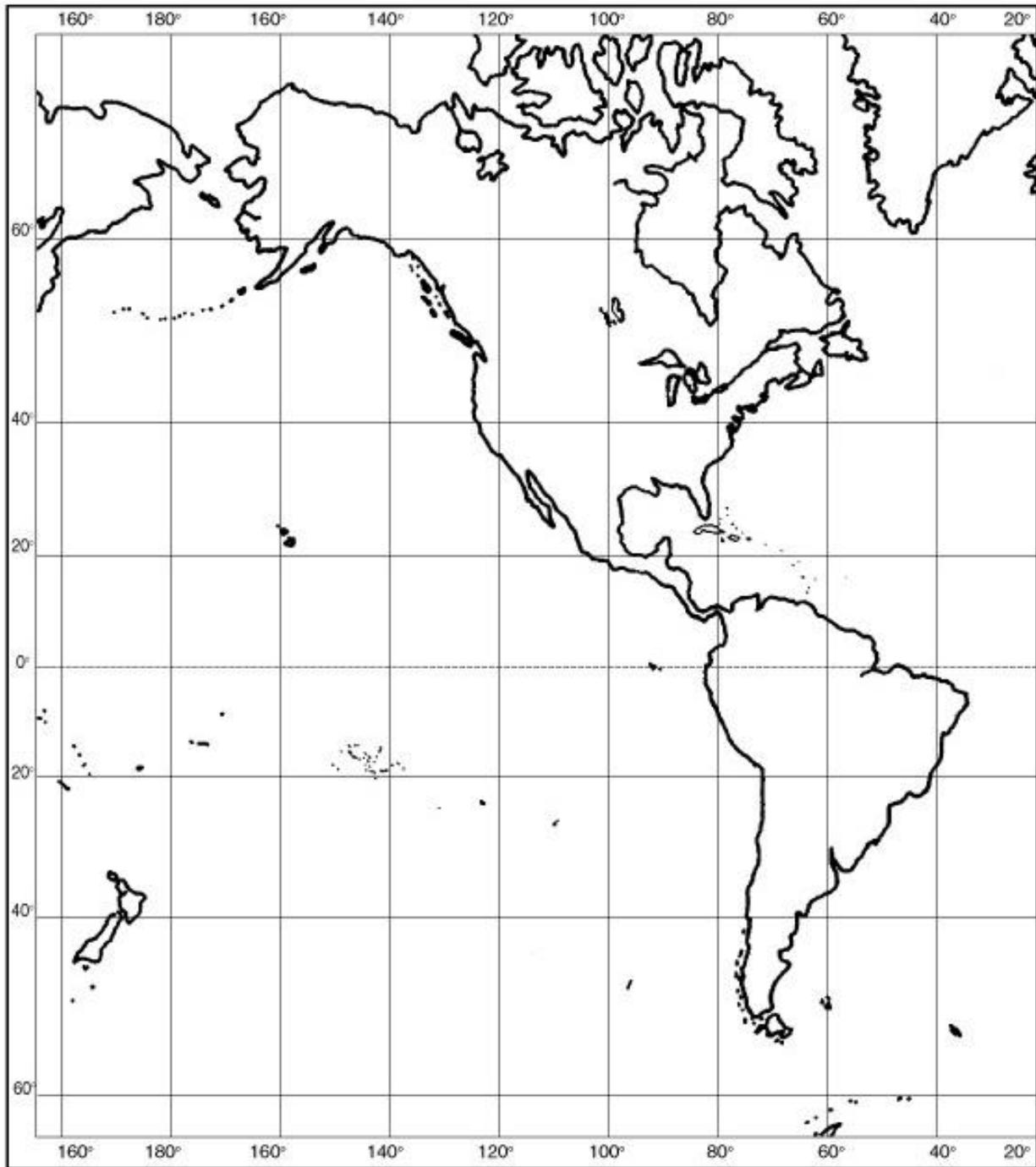
Added Challenge

Make a video report of the voyage using the music and dramatic scenes you have planned.

MAP OF CHINA



Voyage Route Tracking Map



Voyage Route Tracking Map



Nautical Glossary

- aft** (*adj.*) – towards the back or stern of a boat
- aloft** (*adv.*) – high above the deck of a ship in the rigging or on a mast
- autopilot** (*n.*) – an instrument designed to steer a boat and automatically maintain a predetermined course
- barometer** (*n.*) – an instrument for measuring atmospheric pressure and forecasting the weather
- beam** (*n.*) – the width of a ship at the widest part
- bearing** (*n.*) – a determination of position; one point's position with respect to another or to the compass
- beat** (*v.*) – to sail a boat to windward (into the wind) by tacking
- berth** (*n.*) – 1: a space for anchoring or tying up; 2: a job or position; 3: a built-in bed or bunk
- bilge** (*n.*) – the bottommost interior part of a ship; the inner, lower part of a ship's hull
- block** (*n.*) – a wooden, metal or plastic case containing pulleys, through which turns of line are threaded for the purpose of gaining mechanical advantage or changing the direction of motion
- boom** (*n.*) – a spar extending from a ship's mast to hold the bottom of a sail outstretched
- bow** (*n.*) – the front end of a boat
- bulkhead** (*n.*) – any of the upright partitions separating parts of a ship to protect against leakage
- capsize** (*v.*) – to overturn
- car** (*n.*) – a sliding fitting that attaches to a track, allowing for the adjustment of blocks or other devices attached to the car; also known as a slide
- catamaran** (*n.*) – a boat with two connected but distinct parallel hulls
- chart** (*n.*) – a map used in marine navigation
- clew** (*n.*) – the lower aft corner of a mainsail or jib, or either lower corner of a square sail
- clipper** (*n.*) – a sharp-bowed, narrow-beamed sailing ship built for great speed
- cockpit** (*n.*) – a sunken space in the deck of a boat, usually towards the stern and for use by the helmsman
- “come about”** (*v.*) – to change course so that the sail(s) shift from one side of the boat to the other; to tack
- companionway** (*n.*) – a hallway or ladder passage aboard a ship
- compass** (*n.*) – an instrument that shows direction, especially with the aid of a magnetic needle which swings freely and points to magnetic north
- coordinate** (*n.*) – any of a set of numbers in a reference system (e.g., on a map) that determine the location of a point (or ship)
- course** (*n.*) – the direction in which a ship is moving, based on the 360-degree compass; bearing
- current** (*n.*) – the horizontal motion of water, caused by tides, local winds and trade winds
- daggerboard** (*n.*) – a dagger-shaped board that projects down into the water below a sailboat's hull; its purpose is to help keep the boat on course
- deck** (*n.*) – a part of a ship that serves both as a floor and as a full or partial covering for lower ship levels
- desalinator** (*n.*) – a machine that removes salt from sea water to make fresh water
- doldrums** (*n.*) – a part of the ocean near the equator abounding in calms, squalls, and light shifting winds
- ensign** (*n.*) – a flag or banner displayed on a ship
- equator** (*n.*) – an imaginary circle around the earth, equidistant from the North and South Poles, which divides the earth into the Northern and Southern Hemispheres
- fathom** (*n.*) – a nautical measure of depth or distance equal to 6 feet
- fore** (*adj.*) – towards the front or bow of a boat
- furl** (*v.*) – to fold or roll up tightly and secure a sail
- gale** (*n.*) – a nautical term defining weather conditions in which wind speed ranges between 34 to 40 knots
- galley** (*n.*) – the kitchen of a ship
- halyard** (*n.*) – a rope used for raising and lowering a flag or sail
- hatch** (*n.*) – a covered opening in a ship's deck through which entrance can be made to a lower deck
- head** (*n.*) – the bathroom (or sink, shower and toilet) aboard a boat
- heading** (*n.*) – the direction in which a moving ship is pointed, usually expressed in compass degrees
- headsail** (*n.*) – any sail set forward of the foremast
- headwind** (*n.*) – a wind blowing towards the bow of the boat
- “heave to”** (*v.*) – to stop the forward movement of a ship by bringing the vessel's bow into the wind
- heel** (*v.*) – to lean or tilt to one side, as a ship or boat in a high wind
- helm** (*n.*) – the steering apparatus of a ship, such as a wheel or tiller
- hull** (*n.*) – the body of a boat
- immersion suit** (*n.*) – a special bodysuit designed to protect a person from the cold and wet in emergencies
- “in irons”** (*adj.*) – headed into the wind

INMARSAT (n.) – International MARitime SATellite; a satellite communication system used by ships at sea to communicate with other ships or with land-based locations

jib (n.) – a triangular sail secured to a stay forward of the mast

jibe (v.) – to pass the stern of a boat through the wind during a tack

keel (n.) – a ship’s principal structural member, running lengthwise along the hull, to which the frames are attached

knot (n.) – rate of motion equal to 1 nautical mile or 6,076 feet per hour (about 1.15 miles per hour)

latitude (n.) – one of two coordinates (the other being longitude) used to locate a position at sea; marked in degrees north or south of the equator, from 0 degrees at the equator to 90 degrees north or south at the poles; one degree of latitude = 60 nautical miles; latitude is comparable to the x-axis on a graph

leech (n.) – the aft or trailing edge of a sail; the aft edge of a fore-and-aft sail

leeward (adv.) – in the direction towards which the wind is blowing

line (n.) – a rope used on a ship

log (n.) – a daily record of a ship’s speed, progress, etc. and the events in its voyage; logbook

longitude (n.) – one of two coordinates (the other being latitude) used to locate a position at sea; marked in degrees east or west of the Prime Meridian (0 degrees longitude) located in Greenwich, England; longitude may range up to 180 degrees east or west; 180 degrees east and west, in fact, meet on the other side of the globe from Greenwich, at the International Date Line; longitude is comparable to the y-axis on a graph

mainsail (n.) – the largest sail on the ship

“make fast” (v.) – to firmly fasten or secure

mast (n.) – a tall vertical spar that rises from the keel or deck of a vessel to support the sails and rigging

monohull (n.) – a boat with one hull

nautical mile (n.) – a nautical unit of measurement equaling 1.15 statute (land) miles

port (n.) – the left side of a boat when facing forward

radar (n.) – a system or device which uses transmitted and reflected radio waves to detect objects, along with their direction, distance, height, and speed in relation to the device

reach (v.) – to sail with the point-of-sail between close-hauled and a run, with the wind coming from across the side of the boat

reef (n.) – the part of a sail which is rolled up to reduce the area exposed to the wind during a storm

reef (v.) – to shorten or reduce the size of a sail, usually done because of heavy winds

rigging (n.) – the ropes and chains used to support, position and control a vessel’s masts, sails, yards, etc.

rudder (n.) – a broad, flat, movable piece of wood or metal, hinged vertically to the ship’s stern; used for steering

run (v.) – to sail with the wind astern

set (v.) – to raise (e.g., a sail) into position

shackle (n.) – a U-shaped fitting closed with a pin across the open ends and used to secure sails to lines or fittings, lines to fittings, fittings to fittings, anchors to chain, etc.

sheet (n.) – a rope used to control a sail’s angle to the wind

shroud (n.) – part of the standing rigging that helps to support the mast by running from the top of the mast to the side of the boat; sailboats usually have one or more shrouds on each side of the mast

spar (n.) – a stout rounded wood or metal piece (mast, boom, gaff, or yard) used to support rigging

spinnaker (n.) – a large, triangular headsail (at the front of a boat), used when reaching or running

spreader (n.) – a strut leading off a vessel’s mast to hold the rigging wires out and keep the mast straight

squall (n.) – a brief, violent storm

starboard (n.) – the right side of a ship when facing forward

stay (n.) – a heavy rope or cable, usually made of wire, used as a brace or support for a ship’s mast

staysail (n.) – a triangular fore-and-aft rigged sail fastened on a stay

stern (n.) – the back end of a boat

strike (v.) – to lower or take down (e.g., a sail)

tack (v.) – to bring the wind to the other side of a ship by bringing the bow through the wind

trade wind (n.) – a wind that blows steadily towards the equator from the northeast in the tropics north of the equator and from the southeast in the tropics south of the equator

trim (v.) – to adjust (e.g., sails)

trimaran (n.) – a boat with three connected but distinct parallel hulls

watch (n.) – any of the periods of duty into which the day is divided on a ship, so that the work is shared among alternating shifts of the crew

windward (adv.) – in the direction from which the wind is coming