OCEAN INSTITUTE
EXPERIENCE IS THE TEACHER

WELCOME ABOARD!

"I must go down to the sea again, to the lonely sea and sky,
And all I ask is a tall ship and a star to sail her by. . ."

Sea Fever, John Masefield

You and your students are about to embark upon an exciting adventure aboard a real working tallship**!** History comes alive as students experience life aboard a traditionally rigged sailing vessel. In this fun and dynamic program students spend half a day shoreside exploring history while working with real shipboard equipment. After lunch the students cast off and set sail in the open ocean, furthering their learning while participating as crew of a real tallship.

Under the guidance of a Coast Guard certified captain and qualified crew, the students become immersed physically, mentally, and emotionally in real shipboard activities that include: line and sail handling, helmsmanship, history, teambuilding, communication and leadership.

Overall this multi-dimensional program is a unique experience the students are not soon to forget. We manage to combine "living history" with experiential education and hard work into fun adventure where students can challenge their minds and bodies, where they can discover their heritage and themselves.

Should you have any questions, please feel free to contact me directly.

Have a Great Voyage!

Karin Vardaman, Maritime Director
949-496-2274, ext. 218
kvardaman@ocean-institute.org

ADMINISTRATIVE PREPARATION & INFORMATION

ADMINISTRATIVE CONTACTS

For your assistance, listed below are names of Ocean Institute contacts that can help you with any questions you may have.

Rachel Gomez – Reservation Coordinator @ Ext. 211

- Scheduling, payment, and student aid information.

Karin Vardaman – Maritime Director @ Ext. 218

- General program questions, curriculum support, special student needs, policies and parent inquiries.

ARRIVAL AND PAPERWORK

When you arrive at the **Ocean Institute**, please check in at the Visitor Services desk inside the Ocean Institute main building.

Please make sure you have:

- Two copies of the complete manifest including adults (Found in "Required Forms")
- Signed Participant Release of Liability Forms for each participant including adults (Found in "Required Forms").

NAME TAGS

We ask that each student have a sturdy nametag to be worn throughout the voyage. **The tag should have only the student's last name and the crew to which he/she belongs**. If he/she is a mate, remember to put a "Mr." before his/her name.

For the student's safety, the nametag should attach to the clothing and not hang around the student's neck (as the tag could become entangled with a line the child is working with).

APPROPRIATE CLOTHING / LUNCH / THINGS TO BRING

Clothing

All participants need to wear clothing that is safe (long pants and closed-toed shoes with good traction). Clothing should be comfortable to work in and old enough that parents won't mind if it gets dirty or wet. SHORTS, DRESSES, AND SANDALS WILL NOT ADEQUATELY PROTECT THE STUDENTS AND WILL NOT BE ALLOWED DURING THE PROGRAM.

All students will need a sweatshirt or windbreaker along with a warm jacket and sunscreen. A hat is also recommended. For their own safety, students are not to bring gloves, scarves or jewelry (including watches).

Lunch

Students must bring their own sack lunch with drink. There will not be refrigeration to store lunches, therefore food should be able to remain unrefrigerated for several hours.

Seasickness

If the students (or parents) are concerned with seasickness, they may wish to consider taking some type of natural or medical preventative. We recommend Bonine as it does not promote sleepiness as much as Dramamine does. Ginger pills are recommended as a natural seasick preventative. We will also have the following on board should we have any ill students:

- Ginger snap cookies
- Saltines
- Sprite or 7-Up

There will be plenty of fresh water for the students to drink.

Do Not Bring

Students and adults are not allowed to bring:

- Cell phones (except the teacher or group leader – please place on vibrate or mute)
- Pagers
- I-pods, games, or any electrical device

No Smoking Facility

Please inform the Adult Chaperones that there is no smoking on Ocean Institute property

DIRECTIONS TO THE OCEAN INSTITUTE

Dana Point Harbor
24200 Dana Point Harbor Drive
Dana Point, California 92629

DIRECTIONS FROM SAN DIEGO:

Take the 5 Freeway North and exit Beach Cities/PCH 1
Turn Left on Dana Point Harbor Drive and follow road to the end of the harbor

DIRECTIONS FROM LOS ANGELES:

Take the 405 Freeway South to the 5 Freeway South and exit Beach Cities/PCH 1
Turn Left at Dana Point Harbor Drive and follow road to the end of the harbor

STUDENT PREPARATION

We want the students to have fun as they learn, however, they must understand that their tasks are not always easy. They need to know that they will be expected to work hard, work together, and listen to and follow orders. They must understand that the success of their voyage depends on them, their attitude, their willingness to take this adventure seriously, and most of all, their willingness to learn.

ROLE-PLAY

The students need to thoroughly understand the concept of role-playing. The students should know that they will be acting as sailors in the 19th century. All students will be pretending to be "men" as no *women sailors were allowed.

From the moment the First Mate musters the crew on shore, the students will be expected to participate in the role-play for the entirety of the voyage. Our staff will also be pretending, and they will take their characterizations very seriously!

**There are records of women who would disguise themselves as men to go to sea. The sailors, though they would know the truth, would usually not turn them in to the Captain as long as the disguised women would do their duty aloft and on deck along with the rest of the crew*." ~Diary of a Sailor

PROGRAM SCENARIO

You are living in the 19th century and you come from a poor family. Out of desperation and desire for adventure you decide to look for work on a tallship.

As you wander along the shipping docks, you see a notice posted for "Able bodied hands" needed to "work the docks" and prepare to crew aboard the Tops'l Schooner *Spirit of Dana Point* headed to sea for three months.. What an opportunity for a job and adventure! Though you have no experience as a sailor, you convince the First Mate that you are a hard laborer and quick learner so that he may accept you as a working crewmember.

CREWS

Divide your class/group into three "crews." The crews should be named *Port*, *Starboard* and *Midships.* (These are the names of the standard watches kept onboard the ***traditional tallships*)**. Assign a student mate to each crew. The mate will be responsible for relaying orders and making certain all members of "his" crew are working. Choose a mate any way you wish—but remember, the mates must be capable of withstanding the stress of leadership. Guiding these mates will be the ***Spirit of Dana Point*** Officers—the First Mate, Second Mate, Third Mate, Bosun Mate and above all, the all-powerful Captain.

VOCABULARY

"I wish you could hear Mr. Peters' language. It's perfectly elegant. He will give an order to the men just filled with the loveliest nautical terms all run together. I can't make out a word of it. Every mast has about a thousand ropes, the mainmast has sixty that I counted and each rope has a different name. The men all say, when he gives an order, 'Aye, aye, sir,' and run to the top of the rigging where they hang in mid-air by their feet."

By Square-Rigger, the log of Shirley Hyatt.

It is helpful for the students to be familiar with the following nautical vocabulary before they arrive:

AVAST:	Stop
AYE:	Yes
AYE, AYE:	Yes, I understand and yes, I will carry out your orders.
CARRY-ON:	Get started. Students will often be given a series of orders; they must wait for the command "carry-on" before they begin.
SIR:	The Captain. Always call the Captain Sir (and nobody else).

Shipboard Directions

Aft: (Afterward or abaft) In rear to, or towards the stern.

Fore: (Foreword) In front of, or towards the bow, as in be***fore*** the mast.

Port: The left side of a vessel, as one stands facing forward.

Starboard: The right side of a vessel, as one stands facing forward.

Bow: The whole forward end of a ship or boat.

Stern: The backward end of a ship or boat.

SAFETY CONSIDERATIONS

We will teach you all you need to know upon your arrival. Basically, wear rubber-soled shoes and wear long pants. Listen and follow your instructors and ship officer's instructions. Common sense is the rule of thumb.

All our staff are certified in First Aid and CPR and have been trained to handle emergency situations. Additionally, the ship has excellent communication equipment and help is only a few minutes away.

Our Captain is a licensed Coast Guard Captain with over 30 years experience sailing tallships.

THE CAST OF CHARACTERS

The Captain:

The commander and ruler on board. He is a highly educated man who has been a Naval officer for many years. He runs a tight ship and is obeyed in everything.

The First Mate

The active lieutenant, second in command and sailing master. He is the chief disciplinarian and expects nothing less than perfection in the work of the crew. The Captain tells the First Mate what he wishes to have done and leaves it to him to see that his orders are fully carried out.

The Second and Third Mate

Both are experienced and able-bodied seaman and like to be the sailor's friend.

Bosun Mate

Sailor in charge of ship maintenance.

PROGRAM BACKROUND AND RESOURCES

PREFACE

Approximately 500 years ago, something happened to forever change the course of the human endeavor – something so significant that no other event in history has since paralleled it, the advent of the great sailing ship. Cultures previously separated for centuries by impassable bodies of water were suddenly joined. Civilizations and technologies came together for the first time. Nothing has been as critical to the evolution of the human race as travel by sea. The dawn of the sailing ship was the dawn of a whole new world.

> The history of human achievement is defined in large measure by our historical relationship with the sea. Not only has the sea determined the progress and shape of civilization, but our understanding of that relationship, and our responsibilities for stewardship of the oceans will determine our future.
>
> ~ Dr. Raymond Ashley

The 19th Century was considered the *Golden Age of Sail* when magnificent tallships such as *Pilgrim* and ***Spirit of Dana Point*** reigned the oceans in all their glory. Their purpose and journeys varied from cargo traders and emigration to the exploration of new lands and seas.

The men who sailed these great tallships were extraordinary indeed. They came from all over the world and often they did not even speak the same language. The sailors knew that they absolutely had to work together and communicate in order to survive. Each crewmember brought with them their unique strengths and talents and together they sailed the great ships of their time.

PROGRAM OUTLINE

Students will be pretending to be 1830's sailors learning the skills of working a tallship. Their voyage will begin in San Juan Bay (Dana Point) shoreside as they learn the basics of what it means to be a merchant seaman and discover a bit of early California History.

Shoreside Activities include:

- Either Rowing the Longboat or Yard & Sail Activity. *The activity will depend on wind and harbor conditions along with timing of individual program*.
  ~ Longboats were traditionally used to carry crew, passengers and cargo to and from shore. During this activities students will be challenged to work together to maneuver the longboats.
  ~ Yards were used aboard square-rigged ships to hold the sails. Crewmen had to climb up to 100ft above deck in order to set sail. Working together was vital for "survival." This fun activity is conducted only a few feet from deck.
- Moving Cargo. The loading and unloading of cargo aboard tallships was considered one of the most dangerous and challenging of duties. During this activity the students will be presented with the job of moving heavy cargo barrels on and off the ship using a block and tackle system mechanical advantage
- Shipboard Exploration. Students will get a detailed tour of the ship while examining a brief history of early California, primarily the hide trade and the role of merchant ships along the California coast.

Shoreside activities will be conducted aboard the brig *Pilgrim or Spirit of Dana Point and historic Maritime Center.*

During the second half of their program, students will cast off, set sail, and actually head to sea aboard the traditional schooner, *Spirit of Dana Point,* taking their learning to the next level.

At Sea Activities include:

- Line and sail handling
- Working the helm (steering the ship!)
- Watch reporting
- Working with crew to fire the ships gun! (cannon)
- Final summary (Dogwatch)

Students will eat their lunch prior to boarding *Spirit of Dana Point.*

"Salt water produces nothing petty, nothing insignificant. The sea always has demanded from man his greatest courage, endurance, and ingenuity."

Falls of Clyde / A Merchant Ship of the Past, Hawaii Maritime Center

HISTORY OF OUR TALL SHIPS

> One by one the few remaining sailing ships are disappearing. They drop away, and are heard of no more. With them goes much that is worthy and incalculable. It passes like a high squall sinking beyond the horizon, wind and sea, motion and color, romance and inspiration, a whole range of human endeavor, all vanishing to leeward with the tall ships in their midst. . . . The sailing ship stood for a means whereby men were brought to their fullest development. She stood for a profession in which only merit could endure. She stood for things the world cannot afford to lose.
>
> Master Mariner, Lincoln Colcord.

PILGRIM

Pilgrim is a full size replica of the hide brig immortalized by Richard Henry Dana, Jr. in his American seafaring classic novel Two Years Before the Mast. The original *Pilgrim* was built in 1825 at a cost of $50,000. Her length was a mere 90 feet compared to the average 110 feet for other vessels of the same class. The purpose of its 1834 voyage was to participate in the California cattle hide trade for her Boston owners, Bryant and Sturgis. It is not known in what other trades *Pilgrim* engaged after her voyage to Alta California, Mexico. However, it is recorded that she was lost in a fire at sea in 1856. By this time, the hide trade had also suffered its demise.

Length Overall:	130’
Length On Deck:	98’
Beam:	24.6’
Net Tonnage:	64
Built:	1945, Denmark

SPIRIT OF DANA POINT

The schooner ***Spirit of Dana Point*** was built in Costa Mesa, California and launched in 1983. She is an accurate replica of a 1770’s privateer used during the American Revolution. Known for their speed, ship’s such as the ***Spirit of Dana Point*** were used for smuggling and the slave trade.

The Ocean Institute aquired the ***Spirit of Dana Point*** in Spring 2001.

Designed by:	Howard Chapelle
Built by:	Dennis Holland
Length overall:	118’
Beam:	24’
Tonnage:	Net 72

SHIPBOARD LIFE

The Sailors

"What manner of men were these? Many were highly skilled seamen, the like never to be seen again. Others had never been aboard ship; they rolled into port, as the saying had it, with straw stuffed in one ear and hay in the other. In age they ranged from their teens to old age. It was not unknown for a hungry man past his prime to dye his hair with she-black, so that a mate might think him years younger . . ."

EUTERPE, Diaries, Letters and Logs of the *Star of India*, Craig Arnold

The labor of the sailor was endless. If work aloft did not occupy him, holystoning the deck might do. Once a long and arduous passage had been concluded, more brutal work awaited him unloading cargo.

The handling of cargo was considered more dangerous than climbing up to the royal yard in a gale. When the ship was finally unloaded, the First Mate would immediately set the men to work again, painting, scraping rust and beautifying the ship. Great pride was always taken in the condition of the vessel, especially coming into port.

The able-bodied seaman was the most experienced sailor under an officer. He generally had no formal education and could not read or write; however his skills on board were phenomenal. He knew everything there was to sailing a tallship. He was ready to risk life and limb in a moment's notice, to climb aloft in a storm in the middle of the night. He knew without thinking what to do with each line in every situation. He was agile, swift and quick thinking. The safety of the ship, the officers, the cargo and passengers depended on the able-bodied seaman.

The ordinary seaman was a man with little experience who had a lot to learn in a harsh environment. His pay was less than that of an able-bodied sailor and the less *interesting* and most laborious work was left to this man.

Under the ordinary seaman came the greenhand or apprentice seaman. Working up the ranks took years of hard labor and endless life risking experiences. Along with the seaman were the "idlers," named because they did not stand a normal watch. The idlers were kept at work all day and slept through the night. The idlers included the sailmaker, the carpenter and the cook.

The cooks were often chastised for their meals, however, in the cook's defense, the rations they had to work with were not of their own choosing.

Traditionally, the cooks had two purposes: to prepare meals and to act as the doctor on merchant vessels, where no passengers were accommodated. The cook was often nicknamed "doctor" as no real medical personnel were ever provided for sailors. It fell to the cook to act as the doctor as he was the one with most of the knives. Serious injury to a limb usually led to immediate amputation. Upon amputation the limb was dipped in boiling tar to cauterize the wound.

The cooks also had their own special concoctions for treating illness: spices and herbs believed either to have medicinal or spiritual power were administered by the cook to the ailing sailor. The food prepared for the sailors typically consisted of salt meat (preserved meat) and hard tack (old, hard biscuit).

Any fresh meat or produce was reserved for the Captain. The crew would be allotted one cup of water bewitched (weak hot tea) a day. If, however, the ship had recently been in port, the crew may have experienced some fresh provisions – fish, pork, vegetables, potatoes, oats and rice.

Above the idlers, ordinary and able-bodied seamen, came the officers and Captain.

The Second Mate occupied a peculiar position. Socially he was thought of as neither fish nor fowl. He was regarded as an officer yet he was required to work alongside the crew.

The First Mate was second in command, the Captain's right arm and the most visible officer to the crew. It normally fell to the First Mate to enforce discipline in the crew and, if necessary, among the passengers. He supervised the crew directly in their work and saw to it that the Captain's orders were carried out.

The Boatswain oversaw maintenance and ship discipline – his was one of the most skilled jobs important positions on board.

There is no equivalent to command under sail – the Captain. This sort of leadership called for split second decisions combined with the accumulated wisdom of the centuries. However, in Dana's day there were no regulations regarding the treatment of sailors by sea captains and some abused their power as depicted in Dana's book.

"When at last all perils of the sea had been surmounted and the ship came into port, the hardest work of all began. This was the unloading of all cargo, the loading of new cargo, and readying the ship for sea again. The highest number of injuries among the crew occurred while off loading. Hands were smashed, limbs mangled, eyes torn. Then after unloading of cargo, it was a point of honor with the mate to get the ship cleaned up as soon as possible."

EUTERPE, Diaries, Letters and Logs of the *Star of India*, Craig Arnold

GENERAL TERMINOLOGY

"I wish you could hear Mr. Peters' language. It's perfectly elegant. He will give an order to the men just filled with the loveliest nautical terms all run together. I can't make out a word of it. Every mast has about a thousand ropes, the mainmast has sixty that I counted and each rope has a different name. The men all say, when he gives an order, 'Aye, aye, sir,' and run to the top of the rigging where they hang in mid-air by their feet."

By Square-Rigger, the log of Shirley Hyatt.

Please take the time to have your students become familiar with these terms. The following words and phrases will be heard and used regularly on board and it will be very helpful to the students if they understand the nautical terminology.

Aloft: Above the deck, in the rigging.

Amidships: In the middle of the ship (main deck).

Avast: Stop, quit what you are doing, hold your work and await further instructions.

Aye: Yes.

Aye, Aye: "Yes, I understand your orders and yes, I will carry out your orders."

Bight: A bend or loop in a rope.

Bilge: The lowest internal part of the hull where ballast is kept and bilge water collects.

Bitter End: The very end of a piece of rope.

Block: A pulley. A wood or metal case for one sheave (wheel) or more.

"Carry On": Indication that an order is finished being given and must be carried out.

Chantey: Song sung by sailors to coordinate work.

"Doctor": Nickname for the ship's cook because he has the knives.

Forecastle: The crew's quarters in the bow, also called fo'c'sle.

Furl: To raise or roll up a sail.

Galley: The ship's kitchen.

Greenhand: Inexperienced hand on a vessel.

Hatch: An opening in the deck, provided with a hatch cover and a box trim built around it.

Halyard: Any line used for hoisting (raising) sails, cargo, flags, etc. Short for haul to the yard.

Hold: Cargo storage area of the ship.

Kanaka: Hawaiian word for man.

Leeward: Downwind. Pronounced "lou-ward."

Line: A sailor's word for rope that has a purpose.

Mast: A vertical spar for supporting sails and rigging.

Poop Deck: Nickname for the high deck at the stern. The name comes from the after deck section on Roman ships (*puppim* pronounced "poopim") where small statues or sacred images (*puppis* - meaning doll or statue) of gods were kept.

Reeve: To pass a line through a hole, as in a block and tackle system.

"Salt": An experienced seaman on a vessel.

Sheave: The grooved pulley wheel in a block.

"Slack away": To let out line, hand over hand, without losing control of the line.

Spar: Any support for sails or rigging - a mast, yard, boom or gaff.

Stow: To put away in its proper place; applied to anything loose.

Tackle: Line rigged through and around pulleys (blocks) to increase the effect of pull applied. (Pronounced "tay-kle")

Windword: Towards or into the wind.

Yard: Horizontal spar that holds the sails.

OPTIONAL STUDENT PRE OR POST TRIP ACTIVITIES

The following activities were designed to help prepare your students for the voyage ahead. Enjoy and Fair Winds!

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Sailorspeak (Recommended Pre-Trip)

Time: **One day to one week**
Grade Level: **4-7**
Group Size: **Individual**
Vocabulary: **See below**

OVERVIEW

The students will learn and practice traditional sailor vocabulary in preparation for their voyage.

TEACHER BACKGROUND

A sailor's first day can be full of confusion, as life on board is a world of its own. Even the language of the sea has its very own vocabulary. To work as a sailor, you have to speak like one.

Aye	to mean, "yes"
Aye Aye	to mean "yes I understood your orders and yes I will carry them out"
Avast	to mean, "stop"
Sir	every time we speak to the Captain
Carry on	when an officer or mate wants you to begin an order you have been given
Mr.	before the last name of a mate or officer

Unintelligible orders were so rapidly given, and so immediately executed… that I was completely bewildered."

Two Years Before the Mast, Richard Henry Dana Jr.

KEY CONCEPTS

- Sailors had their own unique vocabulary.
- In order to work like a sailor you must understand the language.

MATERIALS

- Worksheet (see next page)

ADVANCED PREPARATION

- Go over vocabulary and the importance of understanding the language.
- Make copies of worksheet (1) per student

PROCEDURE

Engage: Write all of the words on the board and have the students try to define them.

Challenge: Divide the students into their crews. Select someone to be the "mate." This person should always be called Mr. (his/her last name). Select someone else to be the Captain (the teacher might be a good choice) and remember that when you speak to Captain the last word you say must always be "Sir." Now, for a period of time (an hour, a day, a week) all crews should speak like sailors. They should always say "aye" instead of yes, "avast" instead of stop, and so forth. Plan a way of keeping track of mistakes and at the end of the time period, reward the best crew.

Discussion: Ask the students why sailors used the words that they did. Ask the students why they think sailors developed their own language.

Extend: Have the students think of how other cultures today might have their own way of expressing things.

Have the students research the origins of the vocabulary words.

BELLS, BELLS AND BELLS (Recommended Pre-Trip)

♦ THE CHALLENGE

Find a bell (or make one from an empty can) and ring it the correct number of times each half-hour. Do this for a whole day. Remember, bells must be rung in pairs when possible.

1 bell	12:30
2 bells	1:00
3 bells	1:30
4 bells	2:00
5 bells	2:30
6 bells	3:00
7 bells	3:30
8 bells	4:00

1 bell	4:30
2 bells	5:00
3 bells	5:30
4 bells	6:00
5 bells	6:30
6 bells	7:00
7 bells	7:30
8 bells	8:00

1 bell	8:30
2 bells	9:00
3 bells	9:30
4 bells	10:00
5 bells	10:30
6 bells	11:00
7 bells	11:30
8 bells	12:00

♦ The next day, cover the clock and collect all watches but one. Then, write some of the day's activities on the board next to the time they should be done. The one person who still has the watch must ring the bell each half-hour. Everyone else must figure out when to do the day's activities only from listening to the number of bells rung.

"The sailor at the wheel will stand there for his two hours and every half hour he will ring the bell…First the man at the wheel will ring the half hour. The bell in the forecastle responds. Then the watch on the forecastle deck will go to each side and look at the lamp, red on port and green on the starboard, and call, 'Both lights burning and all is well.' The mate in the stern will respond, 'All right.' That happens every half hour through the night."

By Square-Rigger to Honolulu, The log of Shirley Hyatt.

Bells, Bells and Bells

Time: one full day
Grade Level: 4-8
Group Size: entire class
Vocabulary: bell time, watch

OVERVIEW

The students are introduced to the life of a sailor by way of watch keeping. Ship time was vital to the working and running of a ship. Bells were used to keep track of time and work schedules.

TEACHER BACKGROUND

Traditionally, sailors in the nineteenth century worked in four-hour shifts called "watches." Each "watch" lasted four hours, so sailors spent four hours working, then they would have four hours off and so forth around the clock. The sailors rang a bell at half hour intervals. The number of bells would tell the sailors what time it was and how long they had before the end of their "watch." Bells were always rung in pairs.

KEY CONCEPTS

- *Bell time* is the traditional way of keeping time onboard ship.
- Ship *watches* are the work schedules kept on board ship.

MATERIALS

- Bell
- Bell time schedule (see next page).

ADVANCED PREPARATION

- Locate a bell. You can make one with an empty can and a washer on a string.
- Discuss ship time keeping.
- Discuss the concept of "watches".
- Make copies of worksheet (1) per student.

PROCEDURE

Engage: Ask the following questions: How will you know what time it is on the ship? How did sailors know when to work and rest? How do you know when it is time to go to bed or to your next class?

Challenge: Ring the bell the correct number of times each half-hour. Do this for a whole day. Remember that bells must be rung in pairs when possible.

Discussion: Questions for class discussion: How was it keeping to your schedule using bell time. Do you think you could go by bell time in your everyday life? What about on board ship? Why do you think it would be different on this ship?

Extend: Have the student write down their daily schedule ahead of time for a whole week. At the end of the week ask them how close they were to keeping that schedule. Why are schedules important to get things done? What if people did not have time or schedules?

Sea Chanteys

Time: **50 minutes**
Grade Level: **4-7**
Group Size: **Entire class**
Vocabulary: **Chantey, Weighing Anchor, Capstan, Bilge**

OVERVIEW

Students will sing chanteys (songs) to sing while working on the ***Spirit of Dana Point***.

TEACHER BACKGROUND

During the 19th Century when sailing ships such as the ***Spirit of Dana Point*** traveled the oceans, shipboard work relied on the human back, unassisted by mechanical power. It was the purpose of the chantey to coordinate the necessary muscle power into single pulses of concentrated energy that could raise and lower the many tons of canvas and wood necessary to propel a sailing ship through the oceans.

Work chanteys can be found in most cultures and time periods. They tend to reflect the nature of both the work and culture. Whether on land or at sea, their primary use was for work that tended to be laborious and repetitive. The sea chantey, reflecting the cosmopolitan nature of the sailor, revealed a magnificent array of human endeavor. On a single vessel one could hear songs that reflected opinions concerning Hong Kong, New Orleans, cotton plantations, railroads, Irish emigration, wars, national heroes, and political trends. The most popular of all topics was, naturally, the plight of the maltreated sailor. The chantey, being part of the folk tradition, was ever evolving. One can find vulgarity and crudeness. mixed side by side with literacy, sophistication and compassion all due to the various types of sailors (Harvard student, farm boy, blacksmith apprentice and emigrant included) who found their way to the seas. Improvisation was a hallmark of the chantey, there always being more work to do and not enough verse. It is this necessity which imbues chanteys with their richness of cultural heritage.

Cargo handling, weighing anchor, pumping bilges, line handling, setting sail and working the capstan are some of the jobs sailors do that require the use of a sea chantey.

"Windship sailors lived with music…a rough kind they made themselves, more often than not."

Christmas at Sea, Captain Fred K. Klebingat

KEY CONCEPTS

- ❑ Sea chanteys were used to help sailors work together.
- ❑ Chanteys were also used as an avenue for sailors to express their thoughts and feelings.

MATERIALS

- ❑ One sea chantey tape
- ❑ Words/music to various sea chanteys (see following pages)

ADVANCED PREPARATION

- ❑ Make enough copies of chanteys for each student.

PROCEDURE

Engage: Play a song from a sea chantey tape.

Challenge: Learn the verses to the attached sea chanteyand practice them for your voyage aboard the ***Spirit of Dana Point***.

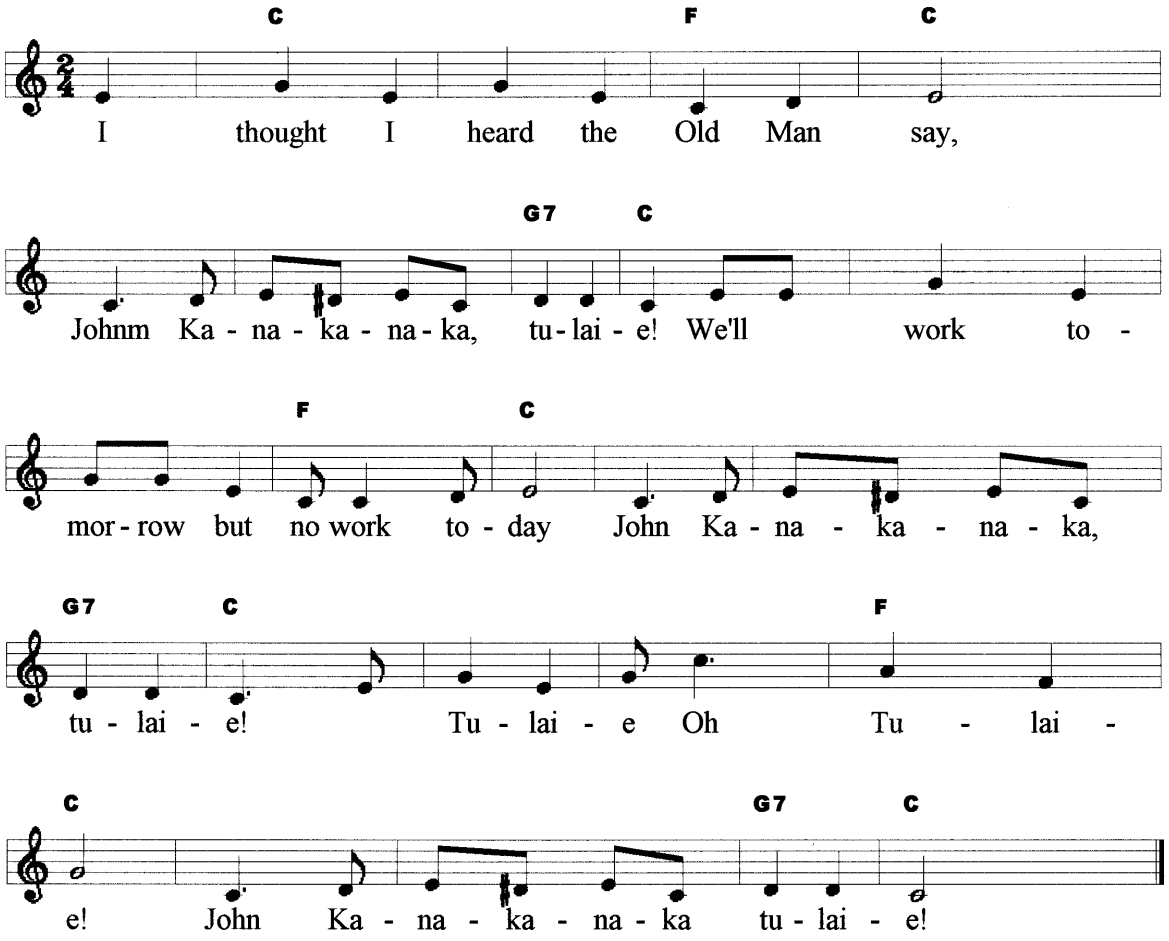
Discussion: Questions for class discussion:

- ♦ Why do sailors sing sea chanteys?
- ♦ How do chanteys help sailors with their work?

Extend: After you have learned the words to *John Kanaka*, make up additional verses that describe what you imagine your voyage will be like.

John Kanaka

Halyard Chantey



A Yankee ship with a Yankee Crew
And we're the buckos to push her through

Oh, haul away, oh haul away
Oh, haul away and make your pay

A Yankee ship with a Yankee mate
If you stop to walk he'll change your gate

Blowing in the Wind

Time: **45 minutes**
Grade Level: **4-7**
Group Size: **By crews**
Vocabulary: **Air pressure, wind foil, lift**

OVERVIEW

Student crews will experiment with the concept of air pressure.

TEACHER BACKGROUND

How is air pressure related to a sailing vessel? If the air pressure is even, the air is still, if the air pressure is uneven, the air moves. Wind is created by the difference in air pressure. Air under higher pressure moves towards, or is pulled, towards air under lower pressure. The amount of difference in pressure will determine the velocity, or strength, of the wind or movement of air.

A sail on a ship may be compared to the wing of an airplane wing. An airplane wing is shaped to create a wind foil. This wind foil creates a low pressure on top of the wing and a high pressure on the bottom of the wing (the air speeds up going over the curve to keep up with the air moving across the flatter bottom half of the wing). This increase in air speed over the top of the wing is what creates the low pressure, causing the lift (more pressure on the bottom of the wing than the top) which is what allows the plane to fly!

A sail on a boat follows the same principles. The shape of the sail along with the direction the ship is moving in relation to the wind direction determines how air pressure affects the movement of the boat. It is the modern sail maker's art to cut the sail with the proper amount of curve, creating the desired wind foil shape. Old square-rigged ships did not have efficient wind foiled sails - the sails were made to be pushed instead of pulled by the wind.

As more was learned about the concept of air pressure and *lift,* it was soon realized that a sailing vessel could actually sail more efficiently and faster being pulled by wind than being pushed by the wind. Thus, the evolution of the sail!

KEY CONCEPTS

- ❑ Wind is caused by the difference in air pressure.
- ❑ Lift is created by lower air pressure above an airplane wing or in front of a sail and higher air pressure beneath the wing or behind the sail.

MATERIALS

- ❑ (2) thick books.
- ❑ (1) sheet of paper
- ❑ (1) straw
- ❑ (3) ping pongs
- ❑ (3) small funnels
- ❑ Worksheet (see next page)

ADVANCED PREPARATION

- ❑ Make copies of worksheet (1) per student. (see next page)

PROCEDURE

Engage: Introduce the concept of air pressure and lift. How does a plane fly? Why do we have wind? How can a boat move faster than the wind? Can you make a ping pong float in mid air? What is meant by low air pressure? High air pressure?

Challenge: Have the students create low air pressure. Have the students make the paper flop and the ping pong ball float!

Discussion: What happened to the paper? Why did it flop down? Have the students discuss the why of each experiment's result.

Why and how if you are blowing down on the ping pong did it not fall to the ground. What kind of air pressure did you create.

Extend: Have the students contemplate; How the same concepts could cause a sailing ship to move. Have the students come up with why a modern sailing vessel can sail faster than the wind is blowing.

BLOWING IN THE WIND

♦ INTRODUCTION

In order for a plane to fly or a ship to sail, lift must be created by air pressure. The following activities will enable you to see high and low air pressured being created and what effect they can have on an object.

♦ CHALLENGE 1

Place two this books of equal size 10cm apart on a table. Lay the sheet of paper across the space between the books. Place the end of the straw just under the edge of the paper. Blow as hard as you can through the straw.

❑ Discuss what happened.

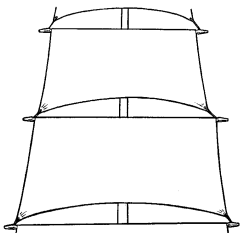
Before the straw was blown into, air was pushing equally on all sides of the paper. As the speed of air increases, the sideways pressure of the air decreases. Forcing a stream of fast-moving air under the paper reduces the upward air pressure under the paper. When the air pushing down on the paper is greater than the air pushing up, the paper is sucked down.

♦ CHALLENGE 2

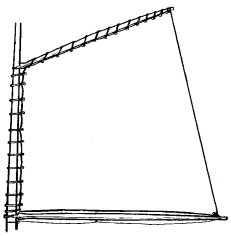
Divide into your crews. Each crew should have a funnel and a ping pong ball. Turn the funnel upside down. Hold the ping pong ball in the funnel with their finger. Start blowing hard into the narrow end of the funnel. Remove your finger from the ball while continuing to blow down into the funnel. The ball will not fall to the ground as long as you are blowing.

❑ Discuss what happened.

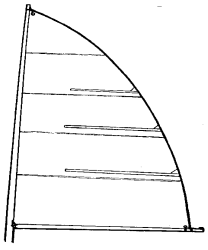
The fast air moving over the top of the ball creates the low pressure. The air under the ball is not moving and creates pressure up against the bottom of the ball. When the air flows faster over the top of the ball (like an airplane wing) than below, there is an upward push called *lift*.

❑ 

Square Sails

❑ 

Gaff Sail

❑ 

Modern Sail

Float A Boat

Time: **50minutes**
Grade Level: **4-7**
Group Size: **Individual**
Vocabulary: **Buoyancy, displacement, gravity, friction**

OVERVIEW

The students will learn the concepts of buoyancy and how a ship floats.

TEACHER BACKGROUND

In this activity the students will experiment with hull shapes to understand the concept of water displacement and buoyancy in terms of how an object floats and moves through the water.

Buoyancy is the ability of a substance to float. An object floats or sinks depending upon its displacement. Any body of water is always striving to be level. When you place a boat in the water, gravity pulls it down and the water is moved out of the way (becomes displaced).

When the water is no longer level there is an upward pressure of water trying to regain a level plain. Increasing the volume (area that an object occupies) increases the amount of displacement - this increases the buoyancy, or ability to float.

Increasing the volume an object occupies increases its surface area, and thus, also. increases the friction it experiences as it moves through the water.

The shape of an object designed to move over a liquid serves two purposes. Minimizing the volume decreases the friction, (like you would want for a speedboat) conversely, maximizing volume increases buoyancy to carry heavy weight (like the ***Spirit of Dana Point***, a cargo vessel).

The hulls of boats are designed to transfer, or spread out the force of the water under it over a lager area, thereby decreasing the force at any particular point. If the pressure of the water pushing on hull is greater than the force of gravity pulling it down, then the boat floats.

KEY CONCEPTS

- ❑ Buoyancy is created by water displacement
- ❑ If the pressure of the water pushing on the hull is greater that the force of gravity pulling it down, then the boat floats.

MATERIALS

- ❑ Tub for water
- ❑ Plastine clay (available at craft stores) or foil sheets
- ❑ $6 in pennies

ADVANCED PREPARATION

- ❑ Fill a large tub with water
- ❑ Make enough clay balls for each student or measure enough foil sheets for each student.

PROCEDURE

Engage: Take a piece of foil or plastine clay and create a basic hull shape. Place several pennies in it and put it in the water. Let the students see how it floats. Take the same piece of clay or foil and squeeze it together into a tight ball with the pennies inside. Place it in the water and allow the students to watch it sink. Have them speculate why the same piece of foil or clay floated before and when condensed into a ball it sank.

Challenge:

Give each student a ball of clay or piece of foil. Have the students experiment with different hull shapes until each student settles on one.

tub of water. Use the pennies to represent cargo (cargo = profit for the captain) and test the efficiency of the hull designs. Place the pennies in each hull until only one remains floating.

Discussion: Discuss the concept of buoyancy in relation to gravity and friction.

Extend: Have the students think of how gravity and friction play a part in the design of hull shapes.

Have the students discuss and contemplate on what would be the best hull shape for a speedboat vs. a cargo carrier.