San Francisco Maritime National Historical Park

Lesson Four

Objectives Match: ***Timeline:*** *1519 - 1579*
Exploration and Colonial History

The Spanish Galleon

The galleon was a common ship type during the era of Spanish exploration along the California Coast. These sailing ships were the result of hundreds of years of development. Although they may seem very complicated (and they are if you consider all the details), these ships followed a basic design that is easily understood.

The basic technology that drove galleons was brought down from ancient times and remained essentially unchanged until the advent of steam propulsion. Therefore, once you understand this ship your students will be able to apply this knowledge in understanding other types. This will be very helpful when you visit us at the Hyde Street Pier. Our ships **Balclutha**, **C.A. Thayer**, and **Alma** used the same kind of technology to get around.

Purpose: Students will learn the parts of a ship and what they do. Students will become familiar with the most common vocabulary used to describe the parts of a sail ship.

What Students Will Do:

- Working in small groups students will research and learn about the different parts of a sail ship, their name, and uses. The parts will be assembled to create a bulletin board display of a sailing ship similar to a galleon.

What to Know:

If you have ever seen a large sailing ship you may have been overwhelmed by the jumble of lines going this way and that. Add to this all the poles which have other poles on them from which hang the sails and your head might begin to spin. On top of all this, many a-salty mariner will throw a bewildering array of sea jargon at you that will seem especially designed to show you how much of a landlubber you really are. However, if you focus on the main parts, forget the details for the time being, and learn a few key terms, a sail ship is quite simple.

The shell of a ship, its body, designed to hold the water out and house the people (crew) and all they carry (cargo) is called the **hull**. The very forward end of the hull is the **bow**, and the back end is the **stern**. Most ropes on board a ship are called **lines**.

The most essential thing to know about a true sail ship is that its sole means of propulsion is the wind. Sail ships harness the wind using **sails**. Sails on galleons, and most other ships during the age of sail, were made of coarse hemp or flax canvas. These tightly woven sails could weigh over a ton.

Sails were arranged on large vertical poles called **masts**. On a three-masted ship like our galleon, the middle mast is called the **mainmast**. The one forward is aptly named **foremast**, and the one behind it (aft of it) is called the **mizzenmast**. The sails would be directly hung from horizontal beams which were attached to the masts. These we call **yards**. The masts, yards, sails, and all the lines used with them are collectively called the **rigging**.

The masts are fixed, but the yards can pivot where they attached to the mast so that the sails can be set at different angles and more efficiently catch the wind. Each yard has a series of lines which enable the crew to move (brace) the yard and their sails.

Any floor on a ship is called a **deck**. The deck that is outside and that you first step on when you come onboard is called the **main deck**. Anything that is above this deck is **aloft**. Thus when a sailor climbs on to the rigging she or he is "***going aloft***."

In order to change direction the crew uses a thing called a **rudder** which is at the stern of the ship, and is attached to a steering mechanism (a wheel or a long lever called a **tiller**). The rudder is like a big blade which is placed into the stream of water traveling along the side of the ship. This causes the stern of the ship to be pushed in the opposite direction. Think of placing your hand outside a car window while it is moving. Sitting in the passenger seat with your elbow on the window frame stick your hand, with your fingers pointing up, out into the airstream. Place your hand so that the front part of your hand is directly into the wind. If you pivot your hand so that your thumb moves towards the car you will feel a force pushing your hand further away from the car. If you pivot in the other direction your hand will be pushed towards the car. A rudder acts exactly this way in pushing the stern of a ship. You now have all the basic information needed to understand most sail ships.

In addition you might learn these helpful terms:

While facing the bow the left side of the ship is called the **port** side and the right side is called **starboard**.

Specialized lines attached to the masts in order to keep them in place and going to the sides of the ship are called the **shrouds.** Other lines used for the same purpose but going from the masts to points forward or aft are called **stays**. A long beam extending forward of the bow used to attach stays is called the **bowsprit**.

The sculpture present on the bow of many large ships is called the **figurehead**. The figurehead comes from an ancient tradition of the sea which may have begun with the painting of eyes in the front of a vessel. These eyes were expected to *look out* for the ship and the crew.

Activity 1: A Paper Ship

Cut out the sections of the illustrations in the following pages. In a photocopier with zoom capability enlarge each section to 129%.Distribute the pieces among small groups of students.

Using multiple sources (such as encyclopedias, illustrated dictionaries, books about ships [see bibliography]) have students find out the names of each part, it's use, and approximately how it should go together. Students will then share orally what they have found out while the class assembles the illustration into a complete picture of a ship. Don't forget to introduce the word **shipwright**. It means ship builder and that is what your students are doing.

Start out with the hull. Have the group assigned the hull name and explain it to the rest of the class. Have students attach this part to your bulletin making sure the part is clearly labeled.

Now ask, "how did a ship move about?" Make sure that students understand that this ship type did not have any kind of engine. Galleons and other sail ships used wind alone to get around. "How did galleons catch the wind?" They used sails. Sails get in the way of the wind, which has force, making the wind push the ship. How many of you have flown a kite? Think of the pull you feel when you hold the string. Now think of tying the kite string to a small boat on a lake. What would happen? Sails work just like that but they are attached directly on the ship.

"In order to have a place for the sails a ship needs masts." Have the group with the masts explain what a mast is. Then have them install the masts on the ship. The foot of each mast should go on its step (attachment points visible inside the hull). "Sails don't go directly on the masts of a galleon, we need another part for each sail. What part is that?" Have students working with the yards explain them and attach them to the ship assembly.

The sails should follow. You might ask, "What are the sails normally made of?", as well as other relevant questions about sails to help in the presentation.

Finally the rudder should be explained and attached to the stern of the ship.

You now have a simplified sailing ship completed.

Look at the attachment called a Spanish Galleon to view an accurate representation of this type of vessel.