

## Working on the Water (Grades 4-6)

Whaleships and fishing vessels played an essential role in New Bedford's economy throughout the nineteenth century. This program provides students with an opportunity to compare and contrast the living conditions and perils endured, as well as the tools used, by those who made their living working on the water.

### Learning standards will be met, as students:

- Identify simple and compound machines used onboard a whaleship
- Understand the importance of maritime industries
- Interpret maps and charts of New Bedford Harbor and Buzzards Bay
- Discuss the historical significance of the schooner *Ernestina*, a local national landmark and former fishing vessel

### Program Highlights:

This program compares and contrasts whaling on the *Lagoda* and fishing on the *Ernestina* – the crews, wages, voyage lengths, schedules, and duties. The program also emphasizes the use of technology (simple machines) used onboard these vessels.

### The *Lagoda* and Whaling:

#### *Lagoda*:

The original *Lagoda* was built in 1826 sailed out of Duxbury as a merchant ship. She was originally to be called the *Ladoga* after Lake Ladoga in Russia. But when the painter worked on the ship he confused the g and the d and it became the *Lagoda*. Since superstition has it that changing the name of a vessel leads to misfortune, the name stuck. She was bought in 1841 by Jonathan Bourne and colleagues and moved to New Bedford, where they converted her to a whaleship. Bourne remained the primary owner and agent for her first 12 voyages, during which she became the single most successful whaleship in New Bedford history, averaging \$6.06/hour during these voyages. In 1871, 40 whaling vessels were north of the Bering Strait when winter came early. 33 vessels were stuck in the ice, while seven escaped. These seven then turned back and rescued the 1200+ men, women and children aboard the other 33 with not a life lost. Among the seven was the *Lagoda*. During that voyage, she still brought home 765 barrels of sperm oil, 2975 barrels of whale oil, and 24659 pounds of whalebone! Shortly before Bourne's death, the *Lagoda* was sold and proceeded to have three more very unsuccessful voyages (approximately 1 whale/voyage) before being sold to Japan and broken up in 1890. The construction of the Bourne Building and model (1915-16) were funded by Emily Bourne (Jonathan's daughter). Since the *Lagoda* had been destroyed over 20 years prior and no blueprints of the original vessel existed, the model is largely based on the *Charles W. Morgan* as they were of similar size, both were originally ships launched in 1841 and both converted to barks at approximately the same time.

## GENERAL INFORMATION ABOUT WHALING

### Length of Voyages:

Schooners and other small vessels often made 6-month voyages from New Bedford to various locations in the Atlantic. These voyages continued into the 20<sup>th</sup> century. Larger vessels, such as ships and barks, would patrol the Pacific in search of sperm whales, North Pacific right whales, bowheads, grays and humpbacks, and would often be gone for 2-4 years at a time. The longest known whaling voyage was that of the *Nile*, spanning 11 years from 1858-69.

### Food/Provisions:

(From the Museum's website) Although the crew's rations ranged from unpleasant to revolting, hard work gave them good appetites, even for greasy pork, hard biscuits, and cockroach-laden molasses. Other fare included "salt horse" (heavily salted beef, pork, or horse), beans, rice, or potatoes. The chance to eat something fresh was a treat. At ports of call, fresh water, fruits, and vegetables were taken aboard. Cooks became used to preparing sea turtles, dolphins, sea birds, and fish. A ship cruising off the African coast once harpooned and ate a hippopotamus.

3-5 whaleboats per ship, depending on size of ship/crew (6 men per boat)

Schedule: 12:00-4:00, 4:00-8:00, 8:00-12:00, 12:00-4:00, 4:00-6:00, 6:00-8:00, 8:00-12:00 (one watch rests, one works for each shift). The short watches were known as the dog watches, and served as a time for eating, recreation, relaxation, readying the ship for the night, and switching the timing of the watches each day. Watches from 4:00am – 8:00am were for preparing for the day (readying breakfast, posting lookouts in mastheads, cleaning decks, checking equipment). Watches from 8:00am – Noon and Noon to 4:00pm were spent scrubbing the decks and caring for equipment (sails, lines, masts, yards, tools/craft for whaling, etc.). Three men were always in the masthead looking for whales, and a fourth was at the wheel. Meals were generally taken just before the whaleman's watch started or just after it ended. When a whale was spotted, all hands were expected to take immediate action, whether their watch was on duty or not. Once the whale was fully processed, the oil and baleen properly stored, and the ship returned to working order, the watches resumed.

### The Crew:

The *Lagoda* crew was typically comprised of 30+ men in their teens, twenties and thirties from various parts of the world, ranging from New England to South Pacific. The crew was assigned duties and lays directly correlating with their experience. It was not uncommon for men in the fo'c'sle to have never met before the voyage.

Greenhands had little to no experience, whereas seamen typically had some experience on a vessel, though not necessarily whaling. These crewmembers slept in the fo'c'sle (short for forecandle), where they often shared their beds with rats, cockroaches, and lice. They did NOT practice hot bunking, however. That is, they did not take turns sleeping in the same bed while their bunkmate worked on deck. Each crewmember had his own bed.

Boatsteerers, also known as harpoone(e)rs, had at least one voyage under their belts and were responsible for darting the whale, then controlling the steering oar during the chase. They shared quarters in steerage, aft of the blubber room.

The cooper, cook, steward, and occasional blacksmith or carpenter would also sleep in steerage. The cooper was the most important member of the crew, caring for the storage of the precious oil and any provisions in the casks. He could also serve as the carpenter and/or blacksmith. The cook was hired specifically to feed the crew and oversee management of the food stores onboard. The steward aided the cook in this. These men were considered 'idlers,' and were charged with keeping the ship while the rest of the crew were in the midst of chasing whales.

The mates had experience on multiple whaling voyages and were the voice of the captain to the crew, and of the crew to the captain. They were each charged with commanding a whaleboat, and two were also responsible for the larboard and starboard watches. The first mate, second to the captain, kept a detailed log of the ship's voyage with coordinates, sightings, stock, successes and failures. A successful first mate had the ability to be stern and understanding, harsh and gentle. He was the greatest advocate for both captain and crew.

The captain was charged by the owners with the ship's success and safety. His greatest responsibility was to ensure a swift and profitable voyage. A successful captain was stern, forthright, and uncompromising, sure of his decisions and quick to take action. A strong first mate may not make a

good captain, and a good captain may not make a strong first mate.

#### Payment:

The crew was paid in lays, or shares of the gross profit of a voyage. A greenhand would often receive a 1/200 lay, while the captain may sign on for as high as 1/8 of the profit. At the end of the voyage, any supplies or payments forwarded to the crewmember and/or his family would be deducted from his share, sometimes leaving him indebted to the owners, requiring him to immediately ship out on another voyage.

#### General Duties:

Besides the catching and processing of the whale, the crew had to maintain the functionality of the ship. This included mending sails, scrubbing and sanding the decks, repairing damaged boats, craft, and masts, cleaning barnacles and other parasites from the hull, raising and lowering sails and anchors, and stowing the anchor chain (a process that often took three days). During their downtime, crewmembers often partook in scrimshaw, playing music, gambling, or spinning yarns (telling fictional stories, often exaggerating past deeds).

### **The *Ernestina/Morrissey* and Fishing**

#### *Ernestina/Effie M. Morrissey:*

The *Effie M. Morrissey*, named for the daughter of her first captain, was launched in 1894 as a fishing schooner (2 masts, gaff-rigged) designed for the Grand Banks south of Nova Scotia and Newfoundland. She was successful through the end of her fishing career in 1925, when she was purchased by Captain Bob Bartlett for Arctic exploration. Bartlett often returned with animals for local zoos and also used the schooner for educational cruises. Shortly after his death in 1946, the *Morrissey* caught fire and was nearly destroyed. She was purchased by Captain Henrique Mendes in Cape Verde, renamed the *Ernestina* (after the new captain's daughter) and was used as a packet ship, bringing people and goods from Cape Verde to New Bedford from 1946-1959. Mendes had an agreement with local cranberry farmers in Massachusetts, helping many immigrants to find work. The *Ernestina* was donated to the United States as a gift in 1975, returned to the U.S. in 1982, and was established as a National Landmark in New Bedford in 1990. Today, she is the third oldest vessel in the United States and one of the oldest **floating** vessels in the world (both titles go to USS Constitution, second oldest U.S. vessel is *Charles W. Morgan*)

Why was the *Ernestina* able to change her name without concern for bad luck? If you look at the nameplate on the schooner, you will see that the new owners never removed the previous name so *Effie M. Morrissey* is still visible.

### GENERAL INFORMATION ABOUT FISHING

#### Length of Voyages:

Typically 3-6 weeks, though voyages could occasionally last up to 3 months.

#### Food/Provisions:

The vessel typically carried food for 10 weeks, even if a shorter voyage was planned.

5-10 dories per ship, depending on size of crew (2 men per boat)

Schedule: Wake up at 5:00am, eat breakfast, out to fish, lunch 10:30-11:00, out to fish again, dinner at 4:00pm, begin processing fish

#### The Crew:

The crew on the typical Yankee fishing vessel consisted of 10-15 men from local families (generally all

from same family or neighborhood) of British, Italian, and Yankee descent.

The Captain was the navigator, and was also the ship's doctor, often using personal cabin as infirmary or emergency room. He also served as councilor and mediator among crew.

The cook was in charge of all food rations, calculating how much to bring onboard and how much to use per meal among crew.

The salter was the most important position among the crew. He had to salt each fish accurately to prevent spoiling and rot.

The captain and cook remained on the ship at all times (the vessels were designed to be manned by as few as two crewmembers).

**Payment:**

On a trawler, the crew is paid equally, with the exception of the cook and captain, who each also earn an additional percentage for their specialized work. Typically, the owners share half of the profit and the crew shares the other half. On hand-line fishing vessels, such as the *Ernestina* and its dories, the fishermen get half of what their fish bring, each man sharing in proportion to his own catch, with the other half going to the owners.

**General Duties:**

Similar to whaling crew, but much more evenly distributed.

The typical fishing vessel employed long lines from dories that were floated with buoys and had hooks hanging from the main line. Each hook was baited, often with squid or capelin. When the fish was first brought into the dory it would be hit on the head with a mallet. The other end of the mallet had a hook called a "gaff" which would be used to bring the fish aboard. Cod were most sought after at this time due to their large populations and ease in rehydrating after being salted. Cod commonly weighed in at 40-50 pounds each during this time.

Processing was done on an assembly line basis. The first to handle the fish after being loaded onto the ship was the Header or Throater who would cut off the head and tail and then place the fish in salted water.

The Splitter opened the fish from tail to neck.

The Gutter removed all organs including the heart and liver. The liver was kept separately so that they could press out the liver oil. This was an additional source of revenue as cod liver oil was considered a special medical tonic. The Salter was responsible for drying out and preserving the fish. Too much salt and the fish could not be properly re-hydrated; too little salt and the fish would spoil. If the fish had not properly dried by the time the ship returned to port it could also be "air-dried."

### **Comparing Use of Simple Machines**

A simple machine is a mechanical device that changes the direction or magnitude of a force. In general, it can be defined as the simplest mechanism that uses mechanical advantage to multiply force.

**Incline plane (ramp onto ship)**

An inclined plane is essentially a ramp. It is easier to move an object on a ramp than to simply carry it, as the ramp takes the brunt of the force of gravity (depending on the angle of the ramp).

**Wedge (bow of boat/ship, harpoon, lance, knife)**

A wedge is two inclined planes joined together and can separate two objects, lift an object, or stop an object from moving. Think of cutting a block of cheese (separating), Tom Cruise trying to look taller (lifting an object), or a door stop (stopping movement). The length of the wedge and the slope of the long side determine how much force it requires (it requires less effort to cut foods such as cheese or

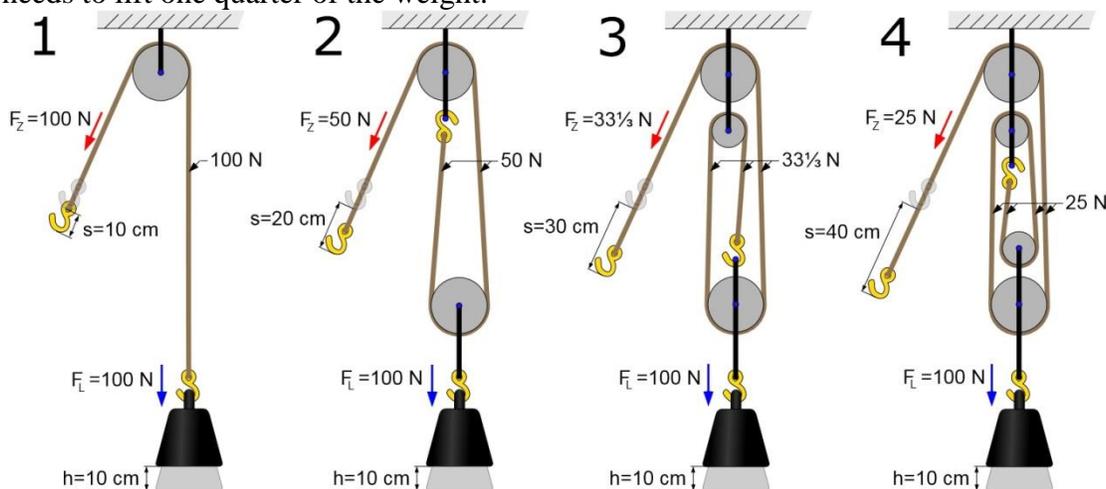
meat with a long, thin blade than it does with a short, thicker one). The bow of a ship cuts through water; harpoons, lances, spades, and knives are designed to cut through blubber; and a small wooden wedge may be placed beneath a cask to prevent it from rolling in the hold.

### Wheel and axle (ship's wheel)

A wheel and axle helps do work because the person only needs to spin the axle and the much larger wheel will turn from the same force applied. This allows a person to move objects further and faster while only needing to turn the axle.

### Pulley (the pulleys)

A pulley not only changes the direction of the force required to move an object (pulling down rather than pulling up to raise a sail, for instance); it can also decrease the amount of energy, or effort, required to do the work. If the line makes one direction change (draped over the pulley), the person has to lift with enough energy to move the full weight of the object. If the line makes two direction changes, however, the person only has to lift half the weight. If it makes three direction changes, the person has to lift one third of the weight, and if it makes four direction changes then the person only needs to lift one quarter of the weight.



### Lever and fulcrum (oar and oarlock)

The lever is used to increase output based on where the fulcrum, or leverage point, is located. Think of using a shovel, using a pole to move a rock, or using an oar in an oarlock. A great example of this in the museum is the entrance to the Wattles Family Gallery. The larger door is easier to open because it is farther from the fulcrum, or hinges, whereas the smaller door, though less weight, is more difficult to open because the handle is closer to the fulcrum.

### Screw (vise on carpenter's bench)

This consists of an inclined plane wrapped helically around a cylinder, and converts rotational motion into linear motion (you turn the screw, it moves up or down depending on the direction). The smaller the distance between the threads of the screw, the less force (effort) it will take to move the object.

### Compound Machine

A compound machine combines two or more simple machines. The windlass is a great example of a compound machine – the handles are levers and the barrel is a wheel and axle.

All of these examples can be found on 19<sup>th</sup> century whaling and fishing vessels and are still common today.