



Adventures and Learning in Marine Careers

Dear Educator,

Get ready to introduce your students to the exciting world of careers on the open waters.



Captain Sandy's Charities, the State of Florida, and the curriculum specialists at Young Minds Inspired have teamed up to introduce students to the wide range of jobs available on yachts and other vessels — including entry level positions — as well as the responsibilities and skills these jobs involve. The program's hands-on STEM

and language arts activities will challenge students to work as a team to solve problems, just like a crew, raising awareness about these diverse job opportunities while supporting Florida State Standards.

We hope that you enjoy this program and will share it with other teachers. And please tell us what you think. COMMENT at ymiclassroom.com/feedback-marinecareers.

We look forward to receiving your comments.

Sincerely,

Dr. Dominic Kinsley
Editor in Chief
Young Minds Inspired

Questions? Contact YMI toll-free at 1-800-859-8005 or by email at feedback@ymiclassroom.com.

Target Audience

High school students

Program Components

Available at ymiclassroom.com/marinecareers:

- This in-depth teaching kit with five reproducible activities
- A poster guide teaching kit with three reproducible activities
- A downloadable poster
- An interactive digital magazine
- A digital quiz
- A reproducible student handout with career resources
- A reproducible student handout on career planning
- A Florida standards chart
- A feedback form

Concepts and Skills

- Explore marine careers
- Career preparedness and planning
- STEM
- Nautical navigation
- Geography
- Reading informational text
- Analytical thinking
- Communication
- Problem solving
- Teamwork

How to Use This Guide

1. Review the activities and consider using them to establish a foundation for learning before using the other program components. These activities can also be used to reinforce the poster guide lessons.
2. Make photocopies of the activity sheets to use in class or email them to families to use at home.
3. Use the information in this teacher's guide to present each activity. Review the answers and invite students to share their learnings.
4. Use the digital magazine and digital quiz in class or provide families with the links to extend the learning at home.
5. Provide students and families with copies of the career resources and planning handouts.

ACTIVITY 1: Welcome on Board!

To introduce the activities, explain to students that *maritime* careers refer to jobs on vessels on the water, while *marine* careers include these jobs as well as complementary jobs on land, such as on the docks. Next, explain that in addition to navigation, engineering, and safety, hospitality is a key element in the yachting industry. Everyone on the crew, including the interior and exterior teams and the chef, work together to make every voyage a memorable experience for every guest.

Have students read the crew profiles. Then, working in groups, students imagine they are working with this crew to create an unforgettable guest experience on board a yacht. Each group will plan itineraries for the yacht guests, making sure to assign necessary tasks to the appropriate crew members.

Extension: Working in the marine industry provides opportunities to travel the world, learn new skills, and meet people. Have students brainstorm places in the world — near or far — that they would like to see, and activities they would like to experience on the water, such as sports and fishing.



ACTIVITY 2: Windy Weather Watch

Materials needed: aluminum foil, straws, and bowls or rectangular containers of water; internet access



Yachting crews are adept at addressing changes, anything from a guest's change of plans to a change in the menu. Crews also contend with changing weather patterns, and knowing how to handle windy weather is essential for safe sailing.

To explore this skill, have students make small vessels with aluminum foil and place them in a low-sided container partially filled with water. Have students use straws to see how "wind" can move their vessels on the water. Then challenge students to experiment with "wind" direction as they try to "dock" the vessel safely against the side of the container.

Distribute the activity sheet and have students read about the Beaufort Wind Scale, which is used to log conditions on the water by matching the conditions observed on the surface of the water to approximate wind speeds and weather conditions. Have students assign the correct Beaufort Wind Scale number to each scenario described on the activity sheet.

Answers:

1. Beaufort number 6: winds 25-31 mph, 22-27 knots, strong breeze
2. Beaufort number 8: moderately high (4-6 meter) waves of greater length, foam blown in streaks, windspeeds of 39-46 mph, 34-40 knots
3. Beaufort number 2: winds 4-7 mph, 4-6 knots, light breeze
4. Beaufort number 12: winds 72-83 mph, 64-71 knots, hurricane
5. Beaufort number 4/5: waves may be 1 meter or higher with spray. Wind speed will increase from 13-18 to 19-24 mph, from 11-16 to 17-21 knots, moderate to fresh breeze

Extension: Have students explore wind speed and weather conditions around the world using the National Oceanographic and Atmospheric Administration weather buoys at: www.ndbc.noaa.gov.

ACTIVITY 3: Learning the Knots

Begin by discussing the information in the activity sheet sidebar, which explains the double meaning of *knot* on board a vessel, where a knot is both a way to tie things and a measure of speed (one knot equals one nautical mile per hour, or 1.15078 standard miles per hour).



Even on modern vessels, knowing how to tie basic sea knots is still a necessary skill for securing items on board and securing the vessel to a dock. Students will use the activity sheet to practice three common sea knots — overhand, figure-eight, and bowline — then work in teams to challenge each other to see just how quickly they can tie, and untie, each knot!

ACTIVITY 4: Navigating Waters

People in the marine industry might find themselves on vessels in a variety of waters, including oceans, rivers, canals, and ports. In every case, the ability to maneuver the vessel safely depends on its *draft*, which is the depth of water necessary for the vessel to float.

Review the map of important waterways on the activity sheet and discuss with students how each is important for shipping and for recreation. Then have students use the draft chart to determine which vessels could safely navigate each waterway. Answers will vary within reason. The activity is meant to start discussion of waterways and how depth of water and draft impact navigation. Point out the role of tugboats to help larger ships move in tricky situations. Provide students with time to research Traffic-Separation Schemes.



Answers: Suggested responses: 1. Lake Superior – all vessels; 2. Strait of Gibraltar – all vessels; 3. Panama Canal – all except MGX-24 Container Ship; 4. Suez Canal – all except MGX-24 Container Ship

Extension: Have students research the blockage of the Suez Canal in 2021 and make a diagram to illustrate what happened and how engineers solved the problem.

ACTIVITY 5: Steering Toward Success

Students will put their learnings about the marine industry to the test with this team challenge. Begin the activity by reviewing the common crew positions listed on the activity sheet. Have students talk with a partner about the positions that seem the most appealing to them. Then have students work in groups as a crew to determine which of the listed tasks would go to which crew members.

Extension: Communication is key on yachts and other vessels — both among crew members and with external groups. Have students research radio training and explore how one vessel might contact another in case of an emergency.

There's a LOT more online at ymiclassroom.com/marinecareers/!

- **Additional Lessons:** Help students identify the various roles and potential job opportunities on yachts and other vessels, learn some yachting lingo, and discover how they might pursue a career in the marine industry.
- **Interactive Digital Magazine:** Share the link to this digital magazine, which features interviews with Captain Sandy Yawn and others in the yachting industry. Students get behind-the-scenes information on what it's like to be part of a crew.
- **Interactive Quiz:** Challenge students to see if their marine knowledge is ship-shape with this fun quiz!



Captain Sandy's Charities



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Welcome on Board!

Welcome to the crew! Each day on board a yacht is a new adventure with new guests and new destinations. A good crew meets each morning with the captain to plan the day. Read about the roles of the crew members listed below. Then team up to form a crew. Have each member of your team select a role from the list. Read the descriptions of the four groups of guests coming on board for a two-day excursion. Select a guest group and create an itinerary for their voyage. Assign duties to the members of your crew to make sure the guest experience is unforgettable!



PART 1: Meet the Crew: Choose your role.

Captain: Navigates the vessel, supervises the crew, including hiring and firing. Responsible for the vessel and all lives on board.

Chef: Plans and executes incredible culinary experiences for the guests. Supervises the galley (the kitchen on a yacht) and always considers each guest's needs and dietary requirements.

Sous Chef: Works with the chef. Sous chefs may be brand new to the yacht, but they come ready to prepare meals. A good sous chef is willing to help anywhere they are needed and can learn on the go as they work their way up to being a chef.

Bosun: Supervises deckhands, making sure they keep the yacht ship-shape for guests. The bosun also sets up water sports for guests. Your bosun is a dive specialist and a kite-surfing instructor.



Deckhands: Support the bosun in keeping the deck clean, safe, and attractive. They may be new to the yacht but are always learning more about yacht safety, operations, maintenance, and water sports.

Chief Steward/ess: Responsible for supervising all the hospitality on board, from room set up to entertainment. They have at least three years of yachting experience and know how to keep guests happy, coordinate with the bosun and chef, and even run lines on deck.

Steward/esses: Support the chief steward/ess, interact professionally with guests, and keep the interior of the vessel clean and inviting. They may be new to marine work, but they usually bring lots of land-based experience from work in the hospitality and service industries.

PART 2: Guest Groups: Choose a group.

Group 1: Diving Dreams

Six adults want to learn to dive and spend as little time on board as possible. They are hoping to swim with sharks! The guests want to be engaged, excited, and entertained, including having something special in the evenings. But be aware, this group loves sea life, so they are vegan and eco-conscious!

Group 2: Sunset Salute!

Four adults want to enjoy beautiful views and long, luxurious dinners. They are foodies who want to explore international cuisines and the best possible sunsets. After long evenings, they look forward to quiet, late morning brunches with a view. They are looking for quiet perfection.

Group 3: Carpe Diem

Two families looking for it all! Four children are excited to try water sports and love movies. Four adults are interested in trying local cuisine, but the kids will need to have a special array of snacks and meals available on demand. They are hoping for lots of fun.

Group 4: Tech Travelers

These seven guests want to be shown the best food and views, but they also need to be connected the entire time. They expect rooms to have virtual workspaces with ample snacks. They want to break up the workday with fishing and wind down with films and more food. This group is pescatarian and hoping to eat what they catch.



PART 3: Create your two-day itinerary! On separate paper, plan a two-day, two-night experience for your guests.





Windy Weather Watch

Weather at sea can be unpredictable. In addition to fog and storms, knowing how to handle windy conditions is essential to guiding a vessel safely.

Wind is created by the interaction of hot and cold air. When surface air is heated, hot air rises and the cold air rushes in to take its place, creating wind. On the water, wind speeds can be estimated by a standardized scale of visual observations.

The **Beaufort Wind Scale** is used by boaters to log wind speeds on the water. The scale matches conditions visible on the water's surface to approximate wind speeds.

Use the Beaufort Wind Scale at www.weather.gov/mfl/beaufort to determine wind speed and conditions based on the following scenarios.



1. From the bridge, the captain sees whitecaps in all directions. Waves are getting bigger, some reaching 4 meters in height. What might the wind be in knots and mph?

2. NOAA (The National Oceanic and Atmospheric Administration) sends out a gale warning. What would the captain expect the water to look like? What would be the wind speeds?

3. Small waves scatter across the surface of the water. Whitecaps can be seen from time to time. Sometimes the water appears glassy. What is the wind speed? What term is used to describe these conditions?

4. Air is filled with foam, making it hard to see. Water is spraying, seriously impacting visibility. Waves are cresting at 14 meters. What is the wind speed? What type of storm is this?

5. NOAA is reporting moderate breeze conditions, becoming fresh in the evening. What will change?

DID YOU KNOW?

In addition to wind strength, the direction of the wind also impacts navigation. Wind direction is always stated from where the wind is coming.

In 2021, a container ship that was knocked off course by wind blocked the Suez Canal. Shipping stopped for 106 days as ships were stuck in front of and behind the wedged ship, impacting world oil prices and the supply chain for many industries.



Learning the Knots

Are you ready to tie the lines and secure the vessel? Even though modern vessels can have motorized lines, knowing how to tie basic sea knots is always necessary to secure items on board and secure the vessel to the dock. Knots are also used to tie fenders off the side of the vessel to protect it during docking and while docked at a marina.

Practice these three common knots and then challenge another future crew member to see just how quickly you can tie and untie the knot!



OVERHAND KNOT

The **overhand knot**, which resembles a pretzel, is a simple knot to make, but almost impossible to untie after it's tightened. Use it wisely!

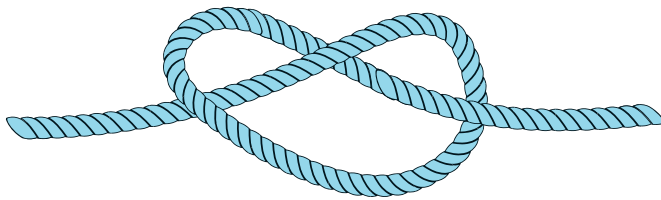
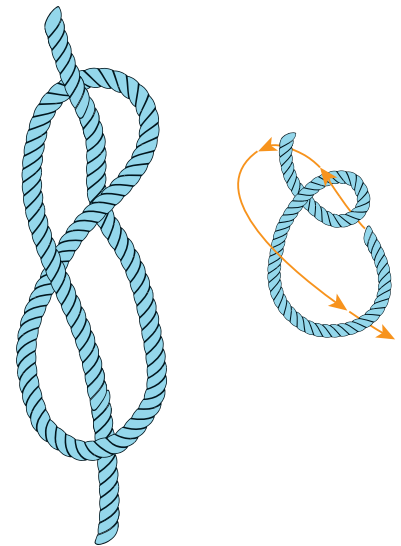


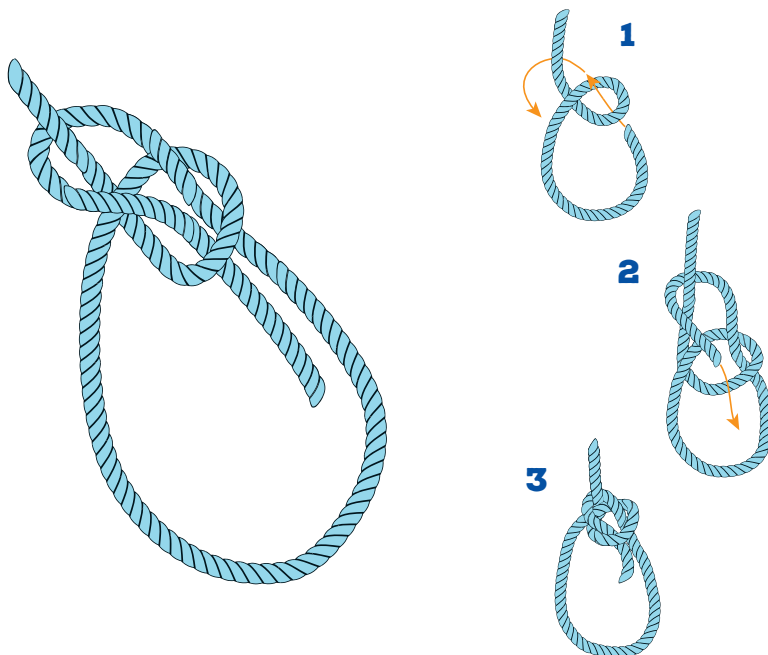
FIGURE-EIGHT

The **figure-eight knot** is formed by adding one more turn to the overhand knot. It's easy to untie, but won't slip through a grommet, which is an eyelet that holds the knot when you thread a rope through it.



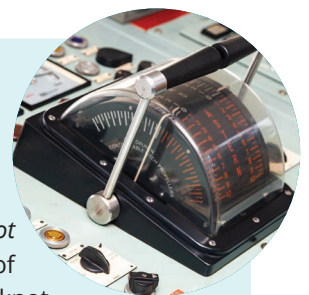
BOWLINES

Bowlines are helpful because they don't slip, can be untied, and can even be used to connect other lines. This is a tricky one.



DID YOU KNOW?

A *knot* is not just something you tie. In navigation, a *knot* is also a measure of speed at sea. One knot equals one nautical mile per hour, or 1.15078 standard miles per hour.



ACTIVITY
4

Navigating Waters

Navigating a yacht or other vessel involves several STEM skills, including measurement.

Every vessel has a *draft*, which is the minimum depth of water necessary for the vessel to float. The draft is the distance from the boat's waterline to the lowest point on the bottom of the vessel.

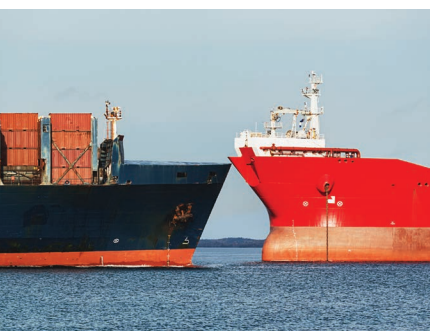


PART 1: The Draft

Using the measurements in this draft chart, determine which vessel(s) could navigate the important waterways listed in the table. Write your answers in the column on the right.

DRAFT CHART	
Type of Vessel	Approximate Draft
Tugboat 	10 ft/3 m
Sailboat 	3-4 ft/1 m
Passenger Ferry 	6 ft/2 m
Catamaran 	3-4 ft/1 m
Superyacht 	7 ft/2 m
MGX-24 Container Ship 	52 ft/16 m

LOCATION			
1. Lake Superior	2. Strait of Gibraltar	3. Panama Canal	4. Suez Canal
			
Second largest lake in the world; used for shipping and recreation	Only entrance from the Atlantic Ocean to the Mediterranean Sea	Shortens the distance from the Atlantic to the Pacific by thousands of nautical miles	Shortest shipping route between Asia and Europe
AVERAGE DEPTH			
483 ft/147 m	1,200 ft/366 m	43 ft/13 m	24 ft/7 m
NAVIGABLE VESSELS			



PART 2: Traffic Rules!

In addition to making sure your vessel will clear the waterway, there are traffic rules on the water, including *Traffic-Separation Schemes* (TSS) that vessels use when entering and exiting major transit port areas. TSSs help keep vessels in lanes. Research TSS and write a paragraph describing how they work.

DID YOU KNOW?

Tugboats are small but powerful! They can push and pull large ships in small areas where ships can't make sharp turns.




 ACTIVITY
5

Steering Toward Success

All hands on deck! It's crew meeting time! Using the list below, assign crew duties to each member of your group. Then brainstorm how you would handle each Shipboard Scenario and take the situation from stress to success. Remember, running a tight ship means teamwork.

CREW LIST: Determine your role.

Captain: Navigates the vessel and supervises the crew.

Chef: In charge of food for crew and guests.

Sous Chef: Works in the galley with the chef.

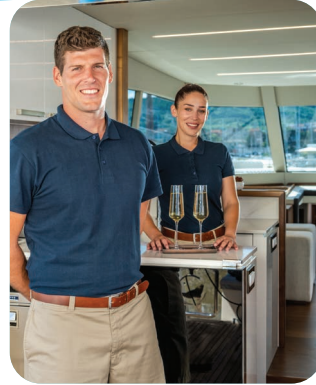
Bosun: Supervises deckhands, working together to maintain the exterior of the boat and water activities.

Deckhand: Supports the bosun.

Chief Steward/ess: Responsible for supervising all the hospitality on board.

Steward/ess: Supports the chief steward/ess and is ready to take on any and every task.

Chief Engineer Unlimited: Responsible for the yacht's engine and engineering systems.



SHIPBOARD SCENARIOS: Brainstorm how your crew will address each of these scenarios. Prepare to share your answers with the class.



Fire at Night – A guest smells smoke in their cabin. Several guests are very tired and don't respond to the fire alarm. The captain is dealing with rough seas. Make a quick plan for evacuating and securing all areas of the vessel.



Water on Board – Water is dripping from a light fixture below deck. One crew member mops it up and goes about their next task. Later, the water begins to leak again, ruining several guest rooms. Make a plan to address the leak and troubleshoot how it could have been handled from the beginning.



Stormy Seas Ahead – A storm is brewing and even turning back to land is going to be a rough journey. How can the captain and crew plan for safety and comfort of the guests and everyone on board?



Welcome to the Table – A group of guests is excited to sample the local cuisine. The chef has never made this type of cuisine before. One guest has several allergies that don't fit with local traditional foods. Make a plan to feed everyone on board while adhering to all their requests.