NOAA Teacher at Sea Lesson Plan

Sample LP - See Yourself at Sea

Subject (Focus/Topic):	Careers and Life at Sea
Grade Level:	Grades 6-8
Average Learning Time:	1.5 hours
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LESSON PLAN DESCRIPTION

Lesson Summary (Overview/Purpose)

Students will work through a series of activities as a team to learn about life at sea and the careers aboard a NOAA research or ocean exploration vessel.

Overall Concept (Big Idea/Essential Question)

What is it like to live and work aboard a NOAA ship?

Specific Concepts (Key Concepts)

Students will learn about life and careers at sea.

- Students can identify the duties of various careers aboard a NOAA ship.
- Students can understand the qualifications needed to work aboard a NOAA ship.
- Students can identify the main parts of a ship.
- Students can use ship jargon appropriately.

Focus Questions (Specific Questions)

1. What skills must one have in order to work aboard a NOAA ship?
2. What types of careers are available aboard a NOAA ship?
3. What is the difference between NOAA Commissioned Officer Corps or Professional Mariners?
4. What are the main parts of a ship called?
5. What are some of the ship specific words that are used every day on a ship?

Objectives/Learning Goals

Students will be given 10 career cards and 10 task cards. Students must flip the cards over and correctly match all the career cards with their corresponding task cards correctly. They will also learn what types of skills and knowledge are required to work aboard a shop as either a NOAA Commissioned Officer Corps or Professional Mariner. Students will be given 10 cards of qualities or skills that are preferred aboard a ship and 10 qualities or skills that are not preferred. They must place all the cards under the correct categories of preferred or not preferred. Students will be given a worksheet with an image of a NOAA research ship. They must unscramble the number codes to correctly identify the main parts of the ship. Students will be given a worksheet with non-ship words on one side and their corresponding ship words on the other side. They must draw a line matching the ship words with the non-ship words. Students are encouraged to use the dictionary or the internet for this section.

Students will learn about careers at sea and the preferred skills or qualities associated with these careers. They will also learn that ships have specific parts with specific names and that there are different words used to describe everyday items or activities.

Background Information

Over 12,000 people work for NOAA, the National Oceanic and Atmospheric Administration. These people work aboard ships as research technicians, chefs, safety officers, or in an office conducting administrative work to name a few roles. NOAA has 16 ships currently in operation worldwide that are responsible for ocean floor mapping, fisheries research, climate and atmosphere data, and ocean processes. The two career paths aboard a NOAA ship are NOAA Commissioned Officer Corps or Professional Mariner. Both are integral to the safe and efficient operation of the ship and science mission. Careers learned in this lesson will be careers focused for the safe and efficient operation of NOAA Ship *Okeanos Explorer*, an ocean exploration vessel.

NOAA Ships: https://www.omao.noaa.gov/learn/marine-operations/ships

NOAA Commissioned Officer Corps: https://www.omao.noaa.gov/learn/noaa-commissioned-officer-corps

Professional Mariner: https://www.omao.noaa.gov/explore/audiences/wage-mariner

Common Misconceptions/Preconceptions

Only certain people can work and live at sea. There are opportunities for all skill levels at sea. Some people work at sea even though they get seasick!

You must grow up near the water to work at sea. All the skills needed to work at sea can be learned. Willingness to try, being a hard worker, and working as a team are the most important skills needed to work at sea.

Teaching Materials

- Materials Included in this Document
  - Land or sea career pre-assessment worksheet
    - Answer key for career pre-assessment worksheet
  - 10 career cards and 10 task cards that must be cut out and laminated if desired
    - Answer key for career and task cards
  - NOAA Commissioned Officer Corps, Professional Mariner, and Other category headings
    - Answer key for career group activity
  - Skill or knowledge activity for difference between NOAA Commissioned Officer Corps or Professional Mariner
    - Answer key for activity
  - 10 preferred skill or quality cards and 10 not preferred skill or quality cards that must be cut out and laminated if desired
    - Answer key for skill or quality cards
    - Questions sheet about why certain skills and qualities are needed aboard a ship
  - NOAA Ship *Okeanos Explorer* image to identify ship parts (Can be laminated if desired. Use a dry erase marker to mark on the card, erase, and reuse.)
    - Answer key for ship parts
  - Ship words worksheet
    - Ship words answer key
- Laminator to laminate cards and worksheets if desired
- Dry erase markers to mark worksheets if desired
- Dry marker eraser or towel to clean laminated cards if using laminated worksheets

Technical Requirements

No technical requirements.

Teacher Preparation

1. Print enough copies of the card activities so each group of students can have one set of cards.
2. Print enough of the worksheet activities so each student can have a worksheet.
3. Cut out cards or have students cut out cards.
4. Optional: Laminate cards and worksheets to use multiple times.

Keywords

- NOAA Commissioned Officer Corps
- Professional Mariner

Pre-assessment Strategy/Anticipatory Set

Test student's general knowledge about careers at sea with some opening activities.

1. Have one student or the teacher come to the board or on a writing platform so everyone can see what is being written. Give the class 1 minute to name as many qualities or skills that are desirable for work and life at sea.

2. Provide a list of careers (from the *Land or Sea career pre-assessment worksheet*) on the board or on a writing platform so everyone can see what is being written and have them identify them as land, sea, or both.

Lesson Procedure

1. Conduct the pre-assessment with students.
2. Students will take the 10 career cards and the 10 task cards, mix them up, and flip them over so the words “career” and “task” are on top. Each student in the group will take turns flipping one career and one task card over trying to match the career card with the correct task card.
3. Once students have matched all the cards, review their matches to determine the correct answers.
4. Have students take the career cards and put them under the categories of NOAA Commissioned Officer Corps, Professional Mariner, or Other. Check student answers.
5. Have students take the skills or knowledge requirements and put them under the correct heading of NOAA Commissioned Officer Corps or Professional Mariner. Check student answers.
6. Take the 10 preferred skill or quality cards and the 10 non preferred skill or quality cards and mix them up. Then have the students place them under the appropriate headings “Preferred Skills and Qualities” and “Not-Preferred Skills and Qualities”.
7. Once all the cards have been placed under a heading, review correct answers with students and have them answer the questions sheet.
8. Hand out the ship parts worksheet. Have students unscramble the number codes by each main part of the ship. Working as a team is encouraged. Once they are finished, have students share their answers to see if they are correct.
9. Hand out the ship words worksheet. Have students match the ship word with the non-ship word. Working as a team and the dictionary or internet search is encouraged. Once they are finished, have students share their answers to see if they are correct.
10. Conduct the Assessment and Evaluation with students.

Assessment and Evaluation

Students’ will be evaluated by revisiting the pre-assessment. Complete the two steps below.

1. Have one student or the teacher come to the board or a writing platform so everyone can see what is being written. Give the class 2 minutes to add or remove preferred skills and qualities from the list made during the pre-assessment.
2. Provide a list of careers on the board or a writing platform so everyone can see what is being written and have them identify them as land, sea, or both. Compare pre-assessment with post-assessment results.

Standards

Ocean Literacy Principles Addressed

- 6: The ocean and humans are inextricably linked.
    - B: The ocean provides food, medicines, and mineral and energy resources. It supports jobs and national economies, serves as a highway for transportation of goods and people, and plays a role in national security.
    - C: The ocean is a source of inspiration, recreation, rejuvenation, and discovery. It is also an important element in the heritage of many cultures.
- 7: The ocean is largely unexplored.
    - A: The ocean is the largest unexplored place on Earth—less than 5% of it has been explored. The next generation of explorers and researchers will find great opportunities for discovery, innovation, and investigation.
    - B: Understanding the ocean is more than a matter of curiosity. Exploration, experimentation, and discovery are required to better understand ocean systems and processes. Our very survival hinges upon it.
    - F: Ocean exploration is truly interdisciplinary. It requires close collaboration among biologists, chemists, climatologists, computer programmers, engineers, geologists, meteorologists, physicists, animators, and illustrators. And these interactions foster new ideas and new perspectives for inquiries.

Other National or State Science Standard(s) Addressed

Common Core State Standards

- Comprehension and Collaboration

Additional Resources

- NOAA Teacher at Sea Blog, Jill Bartolotta: Careers at Sea, June 8, 2019 (helpful for the ship words section) https://noaateacheratsea.blog/2019/06/11/jill-bartolotta-careers-at-sea-june-8-2019/
- NOAA Office of Exploration and Research https://oceanexplorer.noaa.gov/

LAND OR SEA CAREER PRE-ASSESSMENT WORKSHEET

Use this worksheet to determine the difference between land or sea careers but also learn about which types of careers span both land and sea. Write the table below on the board or some device so all the students can see it. Answers are given.

Career	Land	Sea	Both
Scientist			
Chef			
Truck Driver			
Boat Captain			
Medical Officer			
Engineer			
Explorer			
Cashier			
Farmer			
Electrician			
Computer Technician			
Teacher			
Artist			
Professional Mariner			
Car Salesperson			
Lawyer			
Veterinarian			
Construction Worker			
Musician			
Forester			

ANSWER KEY FOR LAND OR SEA CAREER PRE-ASSESSMENT WORKSHEET

Career	Land	Sea	Both
Scientist			X
Chef			X
Truck Driver	X		
Boat Captain		X	
Medical Officer			X
Engineer			X
Explorer			X
Cashier	X		
Farmer	X		
Electrician			X
Computer Technician			X
Teacher			X
Artist			X
Professional Mariner		X	
Car Salesperson	X		
Lawyer			X
Veterinarian			X
Construction Worker	X		
Musician			X
Forester	X		

CAREER CARDS (FRONT, PRINT DOUBLE-SIDED OR GLUE TOGETHER)

CAREER CARD	CAREER CARD
CAREER CARD	CAREER CARD
CAREER CARD	CAREER CARD
CAREER CARD	CAREER CARD
CAREER CARD	CAREER CARD

CAREER CARDS (BACK, PRINT DOUBLE-SIDED OR GLUE TOGETHER)

ENGINEER	CHIEF SCIENTIST
STEWARD	MEDICAL OFFICER
JUNIOR OFFICER	DECKHAND
SAFETY OFFICER	SURVEY TECH
COMMANDING OFFICER	OPERATIONS OFFICER

TASK CARDS (FRONT, PRINT DOUBLE-SIDED OR GLUE TOGETHER)

TASK CARD	TASK CARD
TASK CARD	TASK CARD
TASK CARD	TASK CARD
TASK CARD	TASK CARD
TASK CARD	TASK CARD

TASK CARDS (BACK, PRINT DOUBLE-SIDED OR GLUE TOGETHER)

Responsible for execution of the science mission, management of science staff, equipment operation, teaching youth scientists and explorers, and communicating science updates to shore.	Responsible for the preparation and management of the culinary services and the stateroom services such as bed linens. Tasks include meal planning, food purchasing and storage, food preparation, and oversight of the galley and mess.
Responsible for the health and well-being of all crew while at sea. Tasks include treating minor medical emergencies, providing information on health while at sea, and maintaining medical supplies.	Responsible for the water treatment, air quality systems, and machines needed to make the ship move through the water. The also oversee the hydraulics of the cranes.
Support ship operations, including maintenance of the ship's exterior, maintenance and operation of the ship's cranes (places ROV (remotely operated vehicle) or CTD (conductivity temperature depth) in the water and conducts 24/7 watches to ensure the safe operation and navigation of the ship.	Recent graduates of basic officer training and on their first sea assignments. They are learning how to navigate and drive the ship, the tasks associated with standing watch, and learning about the other ship duties such as safety, public affairs, and operations.
Responsible for the safety drills (fire drills, abandoned ship drills, and immersion suit drills) and equipment.	Responsible for managing operations, understanding mission changes and then speaking with the commanding officer to approve the change. Responsible for all logistics when in port such as power, vehicles, trash, potable water, fuel, and sewer.
Highest rank on the ship. They are ultimately responsible for mission execution and safety of the ship and crew aboard.	Responsible for the operation of all survey equipment aboard the ship needed for mapping and exploration missions. They are responsible for data quality control, processing, and sharing data with shore so it can be used.

ANSWER KEY – FOR CAREER AND TASK CARDS

Chief Scientist: Responsible for execution of the science mission, management of science staff, equipment operation, teaching youth scientists and explorers, and communicating science updates to shore.

Survey Tech: Responsible for the operation of all survey equipment aboard the ship needed for mapping and exploration missions. They are responsible for data quality control, processing, and sharing data with shore so it can be used.

Steward: Responsible for the preparation and management of the culinary services and the stateroom services such as bed linens. Tasks include meal planning, food purchasing and storage, food preparation, and oversight of the galley and mess.

Commanding Officer: Highest rank on the ship. They are ultimately responsible for mission execution and safety of the ship and crew aboard.

Operations Officer: Responsible for managing operations, understanding mission changes and then speaking with the commanding officer to approve the change. Responsible for all logistics when in port such as power, vehicles, trash, potable water, fuel, and sewer.

Safety Officer: Responsible for the safety drills (fire drills, abandoned ship drills, and immersion suit drills) and equipment.

Junior Officer: Recent graduates of basic officer training and on their first sea assignments. They are learning how to navigate and drive the ship, the tasks associated with standing watch, and learning about the other ship duties such as safety, public affairs, and operations.

Deckhand: Support ship operations, including maintenance of the ship's exterior, maintenance and operation of the ship's cranes (places ROV (remotely operated vehicle) or CTD (conductivity temperature depth) in the water and conducts 24/7 watches to ensure the safe operation and navigation of the ship.

Engineer: Responsible for the water treatment, air quality systems, and machines needed to make the ship move through the water. The also oversee the hydraulics of the cranes.

Medical Officer: Responsible for the health and well-being of all crew while at sea. Tasks include treating minor medical emergencies, providing information on health while at sea, and maintaining medical supplies.

NOAA COMMISSIONED OFFICER CORPS OR PROFESSIONAL MARINER?

Print the labels below and have each group of students put the career cards under the correct career group.

NOAA COMMISSIONED OFFICER CORPS

PROFESSIONAL MARINER

OTHER

ANSWER KEY FOR NOAA COMMISSIONED OFFICER CORPS OR PROFESSIONAL MARINER?

NOAA COMMISSIONED OFFICER CORPS

- Commanding Officer
- Operations Officer
- Safety Officer
- Junior Officer
- Medical Officer

PROFESSIONAL MARINER

- Deckhand
- Engineer
- Survey Tech
- Steward

OTHER

- Chief Scientist (Part of the NOAA Office of Exploration and Research)

SKILL OR KNOWLEDGE REQUIREMENTS FOR NOAA COMMISSIONED OFFICER CORPS OR PROFESSIONAL MARINER

Print the skills, knowledge, and career requirements below and have the students place them under the heading of NOAA Commissioned Officer Corps or Professional Mariner.

Professional Mariner	NOAA Commissioned Officer Corps
Four-year college degree in a science, math, or technical field.	May have an engineering degree or work equivalent.
Attend basic training with the Coast Guard.	Complete two 4-hour watch shifts per day.
Complete two 4-hour ship navigation shifts per day.	Works a sea position for 2 years and a land position for 3 years. Rotate back and forth.
Works at sea always, except some engineers who work only in port.	When promoted they move up in rank.
May attend mariner school or gain experience working at sea.	When promoted they become Department Head or Chief.

ANSWER KEY FOR SKILL OR KNOWLEDGE REQUIREMENTS FOR NOAA COMMISSIONED OFFICER CORPS OR PROFESSIONAL MARINER

NOAA COMMISSIONED OFFICER CORPS

- Four-year college degree in a science field.
- Attend basic training with the Coast Guard.
- Complete two 4-hour ship navigation shifts per day.
- Works a sea position for 2 years and a land position for 3 years. Rotate back and forth.
- When promoted they move up in rank.

PROFESSIONAL MARINER

- Engineering degree or work equivalent.
- Complete two 4-hour watch shifts per day.
- Works at sea always, except some engineers who work only in port.
- May attend mariner school or gain experience working at sea.
- When promoted they become the Department Head or Chief.

PREFERRED SKILL OR QUALITY CARDS

Preferred	Not preferred
Able to work as member of a team.	Talks about others behind their backs.
Unwilling to adapt to change.	Can live in close quarters with other people.
Hardworking.	Adapts to change easily.
Lazy.	Kind.
Know-it-all.	Follows direction.
Rude to others.	Gives up easily.
Does whatever they want.	Willing to learn.
Mean to others.	Determined.
Follows orders.	Needs lots of space.
Comfortable being on the water.	Doesn't want to try new things.

ANSWER KEY FOR PREFERRED SKILL OR QUALITY CARDS

Preferred

- Able to work as member of a team.
- Can live in close quarters with other people.
- Hardworking.
- Adapts to change easily.
- Kind.
- Follows direction.
- Willing to learn.
- Determined.
- Follows orders.
- Comfortable being on the water.

Not preferred

- Talks about others behind their backs.
- Unwilling to adapt to change.
- Lazy.
- Know-it-all.
- Rude to others.
- Gives up easily.
- Does whatever they want.
- Mean to others.
- Needs lots of space.
- Doesn’t want to try new things.

QUALITIES AND SKILLS WORKSHEET

Date: _____

Name: _____

Why do you think it is important for people working and living at sea to have the preferred qualities?

Think of 3 more qualities or skills that someone living or working at sea should have and write them below.

1._____

2._____

3._____

Which of the preferred qualities do you have? (Write down three qualities.)

1._____

2._____

3._____

SHIP PARTS WORKSHEET

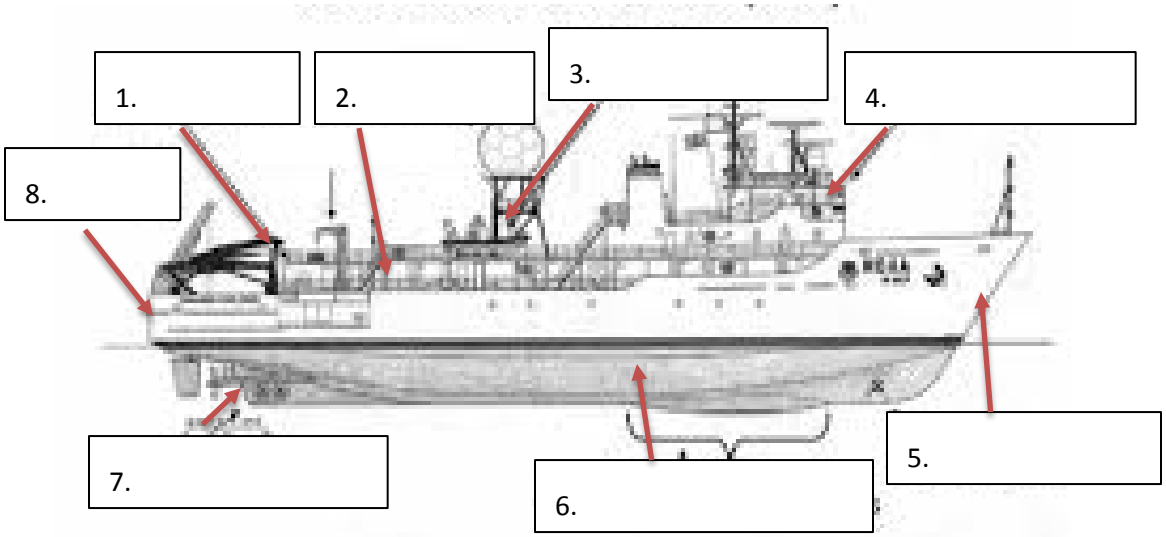
Date: _____

Name: _____

Number Key

A:	1	**F:**	6	**K:**	11	**P:**	16	**U:**	21
B:	2	**G:**	7	**L:**	12	**Q:**	17	**V:**	22
C:	3	**H:**	8	**M:**	13	**R:**	18	**W:**	23
D:	4	**I:**	9	**N:**	14	**S:**	19	**X:**	24
E:	5	**J:**	10	**O:**	15	**T:**	20	**Y:**	25

NOAA Ship *Okeanos Explorer*



Use the number key above to find the letter that matches each number. Label the ship parts in the picture once you have the answer.

1. The___ ___ ___ ___ ___ ___holds the cables used to lower equipment into the water.
   1 6 18 1 13 5
2. The top part of a ship is called the ___ ___ ___ ___. Crew walk on it.
   4 5 3 11
3. The ___ ___ ___ ___ ___ ___ ___ ___ connects ship communications to land.
   22 19 1 20 4 15 13 5
4. The ___ ___ ___ ___ ___ ___is where the ship is driven.
   2 18 9 4 7 5
5. The front of the ship is called the ___ ___ ___.
   2 15 23
6. The bottom of the ship is called the ___ ___ ___ ___.
   8 21 12 12
7. The ___ ___ ___ ___ ___ ___ ___ ___ ___moves the ship through the water.
   16 18 15 16 5 12 12 5 18
8. The back of the ships is known as the ___ ___ ___ ___ ___.
   19 20 5 18 14

ANSWER KEY FOR SHIP PARTS WORKSHEET

1. A Frame
2. Deck
3. VSAT Dome
4. Bridge
5. Bow
6. Hull
7. Propeller
8. Stern

SHIP WORDS WORKSHEET

Date: _____

Name: _____

Draw a line to match the ship words with the correct words used on land. See example below.

1. Galley	Front of Ship
2. Bow	Kitchen
3. Aft	Bed
4. Port	Bathroom
5. Starboard	Bedroom
6. Mess Deck	Announcement
7. Bulkhead	Ceiling
8. Rack	To the back of the ship
9. Head	Group of people
10. Pipe	Left side of ship
11. Stateroom	Floor
12. Muster	Right side of ship
13. Deck	Dining area
14.Scuttlebutt	Wall
15. Overhead	Gossip

ANSWER KEY FOR SHIP WORDS WORKSHEET