NOAA Teacher at Sea Lesson Plan

Fish Lab Scientists

Subject (Focus/Topic):	Science/Math
Grade Level:	Pre-K through Kindergarten (Special and/or General Education)
Average Learning Time:	2 hours (depending upon how many "lesson levels" the class reaches) -- It could be done in various steps over several days depending upon the age and concentration level of the students.
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LESSON PLAN DESCRIPTION

Lesson Summary (Overview/Purpose)

Students will experience the excitement of a load of fish and jellyfish falling out of a net and landing onto the table before them (albeit colorful, laminated, cardboard cut-outs) and use visual discrimination and pre-math skills to sort them into buckets by species and then further sort and order them by size, measure them, and learn the names and details of each species. They will also be introduced to the concept of keeping the ocean clean.

Overall Concept (Big Idea/Essential Question)

Students will use hands-on methods and math skills to explore and learn about various fish and jellyfish, and record data, in a setting that is appropriate for their age and individual sensitivities.

Specific Concepts (Key Concepts)

- Students will identify and use a variety of observation and measurement tools.
- Students will compare objects and describe similarities and differences.
- Students will identify the characteristics of a greater variety of animals than they normally encounter.
- Students will sort and classify objects by one or more attributes into two or more groups.
- Students will order four or more objects by size.
- Students will gain a basic understanding that we are all responsible for helping to keep the ocean (and the planet) clean.

Focus Questions (Specific Questions)

1. What is unique about each fish or jellyfish to which they are introduced?
2. How does one use a ruler to measure something?
3. How does one differentiate between two similar species or items?
4. What words can one use to describe the size, color, or shape of things?
5. The concept of bigger and smaller.
6. The concept of size order.
7. How to record data.

Objectives/Learning Goals

Given at least forty (40) small, medium, and large laminated, colorful representations of fish and jellyfish (or more depending upon class size), students will become familiar with their common names, differentiate between them, sort them, measure them, and put them in size order, with 75% accuracy.

Background Information

Special education preschoolers who do not read, and have trouble with multisyllabic words, may need to be taught and retaught the names of the marine life. Pre-teach that in a lesson before the actual "fish lab" lesson and include videos and live cams of the actual fish and jellyfish.

A great way for them to see what this lesson attempts to recreate is to have them view all or part of NOAA video: Alaska's Pollock Fishery: A Model of Sustainability https://www.youtube.com/watch?v=C67yFq-0lVM. This will let them see a large quantity of fish being dumped from a net onto a table and then sorted and measured so that they will better understand why laminated fish will be falling out of the net above them onto the table for them to sort and measure.

To help them remember the names of the marine life: Show them a picture of a fried egg and a picture of the fried egg jellyfish so that they see WHY the *Phacellophora camtschatica* is called the fried egg or egg yolk jellyfish.

Explain the following about the *Chrysaora melanaster* to break it down and give clues for remembering its name (for older or more verbal students): On NOAA Ship *Oscar Dyson*, they catch many large *Chrysaora melanaster* jellyfish in the nets. Each jellyfish's long, flowing tentacles gets tangled with the long, flowing tentacles of all the other jellyfish. As you try to pull them apart, you have to be very careful or you could get smacked in the eye with a tentacle, causing you to cry and have a sore eye – thus CRY-SORE-EYE (for *Chrysaora*). Also, it was a nasty job to have to separate them, so think mela-NASTY (for *melanaster*).

For herring, read (or play the video linked below) *The Rainbow Fish*, a story about a little fish who had tons of sparkly, rainbow-colored scales, and had to learn to share them with others. Then show them a picture of the sparkly herring and explain that the herring was like the rainbow fish after he had learned to share, as herring often leave sparkly scales everywhere in the fish lab.

Review math concepts of size, size order, sorting, and how to measure using a ruler.

Common Misconceptions/Preconceptions

Young students often think that anything that lives in the water is a fish and that all fish are the same shape. They may also think that fish looks like pieces of fish in the supermarket, or that they are all small like fish tank fish or all huge like whales and sharks that they see in videos.

Teaching Materials

Physical Items

- A large table/surface
- A net to drop the laminated pictures from
- Rulers (or yard sticks if you print things larger than 12 inches)
- Markers or pencils
- Large baskets such as laundry baskets or crates (for sorting)
- Goggles (NOT required but adds to the scientist/fish lab vibe)

Incorporated Resources

Items included at the end of this lesson plan.

- Laminated fish photos (walleye pollock, herring, lumpsuckers, and prowfish,) and jellyfish (*Chrysaora melanaster* and fried egg or egg yolk), in varied sizes.
- Worksheets to keep track of what they found and how big it was (TWO VERSIONS INCLUDED)

Digital Resources

Interactive files to be used on a computer.

- none

Technical Requirements

- Laminating machine

Teacher Preparation

1. Print, cut out, and laminate fish and jellyfish of various sizes.
2. Print out worksheets for students to record their data. (One version allows students to draw what they are measuring; one does not.)
3. As set forth above in the Background section, in preparation, show them videos of a haul of fish and photographs of the marine life that will be used in the assignment, such as the lumpsucker, pollock, herring, and prowfish and provide information about each one (see below). As mentioned above, show a picture of a real fried egg and a picture of the fried egg jellyfish so that they see WHY it is called that. Also let them know that the *Chrysaora melanaster* is also called the brown jellyfish (easier for young children to say and remember) and they can use the color to assist with differentiating it from the fried egg jellyfish. (See link to jellyfish live cam below.)

4. For herring, read (or reference if they are familiar with it) the story of *The Rainbow Fish*, about a little fish who had tons of sparkly, rainbow-colored scales, and had to learn to share them with others. I would then show them a picture of the sparkly herring and explain that one way to differentiate herring from pollock is that herring are very sparkly like the rainbow fish. Add some gold or silver paint or marker to the herring prior to laminating so that the herring really do sparkle more than the pollock. I would explain to the children that we should not use real glitter or sparkles as they are harmful to the environment. Most glitter is made from plastic, and plastic creates big problems for fish and other marine life. When glitter is washed down the drain, it makes its way to the ocean and is then consumed by plankton, fish, and birds. The glitter could then make its way up the food chain, so when we eat a fish, we could be eating glitter. Depending upon the age of the students, you could explain that fish and other animals could get sick or even die if they eat enough glitter or plastic that ends up in the ocean, so we all need to do our best to keep plastic out of the ocean. (A follow up story about marine animals eating plastic is *The Adventures of Gary and Harry: A Tale of Two Turtles*.)
5. For pollock, show them pictures of the fish and ask them if they have ever eaten pollock. Then show them pictures of fish sticks (and for older students, sushi such as California rolls) and explain that pollock is the fish used for those food items.
6. Set up a large table.
7. Set up laundry baskets or crates with a picture of each species attached thereto so they can be used for sorting.
8. Find a net (or make some sort of holder) to drop the fish from all at once.
9. Depending upon the age or level of the students, review math concepts of size, size order, sorting, and how to measure using a ruler.

Keywords

- Pollock
- Herring
- Jellyfish
- Lumpsucker
- Prowfish

Pre-assessment Strategy/Anticipatory Set (Optional)

Ask, “Who has gone to a beach or a lake?” Inquire as to what they did at or in the water. Ask, “Was the water clean?” or “Did you see any trash or plastic in the water?” Ask, “Has anyone gone fishing and what did you catch?” “Were you in a boat or on the shore?” Show them pictures of fish that they may have eaten in the past (including fish sticks and sushi). Ask, “Have you ever seen jellyfish at the beach?” For all young students, most of these questions will be better understood if supported with visuals, such as live webcam footage (https://explore.org/livecams/oceans/seajelly-cam) where they can see West Coast sea nettle jellyfish.

Lesson Procedure

1. Show all or some of the NOAA video of fish being dropped out of the net, sorted, and measured.
2. Pre-teach about the marine life you will be using in the lesson. For some classes, it will be a large variety; for others, use a smaller variety with simpler terminology (names).
3. Explain that they will be sorting, measuring, and recording data.
4. Show them how to measure and record data on the worksheet. (Some will need more support measuring and writing the numbers.)
5. Show them the baskets for sorting with the pictures of the marine life attached so they can sort by matching the picture.
6. Explain that they will each take one laminated item at a time off the table to sort it into the correct basket.
7. Once all items have been sorted, they will get a ruler and begin to take one item at a time out of a basket to measure and record the measurement on their worksheet. Once they have several of the same species measured, they will put them in size order.

Assessment and Evaluation

At this age, much of the assessment will be through teacher observation (and a review of the worksheets). Were they able to sort and put things in size order? Did they understand how to use a ruler? Could they tell you the number on the ruler? Could they write that number on their paper? Did they remember the names of the different species and/or any of the distinguishing characteristics? Do they remember why it's bad to throw plastic or trash in the water (or even in the street)?

State Science Preschool Standards

- California Preschool Learning Foundation: Science: Scientific Inquiry: Observation and Investigation 1.2 – Observe objects and events in the environment and describe them.
- California Preschool Learning Foundation: Science: Scientific Inquiry: Observation and Investigation 1.3 – Begin to identify and use, with adult support, some observation and measurement tools.
- California Preschool Learning Foundation: Science: Scientific Inquiry: Observation and Investigation 1.4 – Compare and contrast objects and events and begin to describe similarities and differences.
- California Preschool Learning Foundation: Science: Scientific Inquiry: Documentation and Communication 2.1 – Record observations or findings in various ways, with adult assistance, including pictures, words (dictated to adults), charts, journals, models, and photos.
- California Preschool Learning Foundation: Science: Life Sciences: Properties and Characteristics of Living Things 1.1 – Identify characteristics of a variety of animals and plants, including appearance (inside and outside) and behavior, and begin to categorize them.

Ocean Literacy Principles Addressed

These are the main Ocean Literacy Essential Principles and Fundamental Concepts this lesson addresses: http://www.coexploration.org/oceanliteracy/documents/OceanLitChart.pdf

- 1(g): The ocean is connected to major lakes, watersheds, and waterways because all major watersheds on Earth drain to the ocean. Rivers and streams transport nutrients, salts,

sediments, and pollutants from watersheds to coastal estuaries and to the ocean.

- 5(a): Ocean life ranges in size from the smallest living things, microbes, to the largest animal on Earth, blue whales.
- 6(d): Humans affect the ocean in a variety of ways. Laws, regulations, and resource management affect what is taken out and put into the ocean. Human development and activity lead to pollution (point source, nonpoint source, and noise pollution), changes to ocean chemistry (ocean acidification), and physical modifications (changes to beaches, shores, and rivers). In addition, humans have removed most of the large vertebrates from the ocean.
- 6(g): Everyone is responsible for caring for the ocean. The ocean sustains life on Earth and humans must live in ways that sustain the ocean. Individual and collective actions are needed to effectively manage ocean resources for all.

Other Standards Addressed:

- California Preschool Learning Foundation: Language and Literacy: Listening and Speaking: Vocabulary 2.2 – Understand and use accepted words for categories of objects.
- California Preschool Learning Foundation: Language and Literacy: Listening and Speaking: Vocabulary 2.3 – Understand and use both simple and complex words that describe the relations between objects.
- California Preschool Learning Foundation: Mathematics: Number Sense 1.2 – Recognize and know the name of some written numerals.
- California Preschool Learning Foundation: Mathematics: Algebra and Functions (Classification and Patterning) 1.1 – Sort and classify objects by one or more attributes in to two or more groups, with increasing accuracy.
- California Preschool Learning Foundation: Mathematics: Measurement 1.0 – Children expand their understanding of comparing, ordering, and measuring objects.

Additional Resources

- https://explore.org/livecams/under-the-water/shark-lagoon-cams (live cam)
- https://explore.org/livecams/brown-bears/underwater-bear-cam-brown-bear-salmon-cams (live cam)
- Meet the Lumpsucker (video) https://www.youtube.com/watch?v=wJEEFgajO_s
- NOAA video: Alaska's Pollock Fishery: A Model of Sustainability https://www.youtube.com/watch?v=C67yFq-0lVM
- KEEP THE OCEAN CLEAN- (a kids' music video by Birdsong and the Eco-Wonders) https://www.youtube.com/watch?v=1vyHtYwQz-0
- *The Rainbow Fish* by Marcus Pfister https://www.youtube.com/watch?v=r9mryuEKkKc (read aloud of story)
- Prowfish videos: https://www.facebook.com/AlaskaSeaLifeCenter/videos/2124693294456687 and https://www.youtube.com/watch?v=IK3mUSga6Mw
- *The Adventures of Gary and Harry: A Tale of Two Turtles* by Lisa Matsumoto

PHOTOS OF FISH LAB AND FISH PHOTO CARDS

One part of one catch on the belt aboard NOAA Ship *Oscar Dyson*

(By showing this picture, students can see what you are recreating in the classroom.)

A photo depicting various sizes of Walleye Pollock

Herring

Walleye Pollock

Prowfish

Lumpsucker

Jellyfish

Chrysaora sp.

Jellyfish

Chrysaora sp.

FISH LAB SCIENTIST'S DATA SHEET

Student's Name_____

What is it?

Prowfish _____

Herring _____

Pollock _____

Lumpsucker _____

Chrysaora melanaster (brown jellyfish) _____

Fried Egg Jellyfish _____

How big is it?

_____ inches

FISH LAB SCIENTIST'S DATA SHEET (WITH DRAWING)

Student's Name_____

Draw the marine life you are measuring:

What is it?

Prowfish _____

Herring _____

Pollock _____

Lumpsucker _____

Chrysaora melanaster (brown jellyfish) _____

Fried Egg Jellyfish _____

How big is it?

_____ inches