Deep-Sea Samples

ACTIVITY: Students sort, identify, count, and graph animals

GRADE LEVEL(S): K to 12th

30 -40 minutes

OVERVIEW: For this lab, students put themselves in the shoes of a deep-sea scientist to count animals and determine distribution and population

DISCIPLINES: Science, math

OBJECTIVES: Students will be able to:
- discuss how and why scientists count animals in the deep
- recognize that population sampling helps scientists determine species, distribution, population size, daily, seasonal, and long-term changes in population.
- describe challenges of determining and tracking animal populations

Background:
With MOCNESS, the DEEPEND Science Team collects small samples of animals from different depths and locations. Then they sort, identify, and count them. Twice a year for three years, the DEEPEND Science Team returns to take samples at approximately the same location and depth. This research will help fill in that gap of knowledge, help determine populations and provide an important baseline of information about the Gulf of Mexico deep sea.

MATERIALS:

- painter's tape
- butcher's paper (optional)
- photocopies of *Deep-sea Sample Tracking Chart* (one per student per sample square)
- photocopies of *Deep-sea Sample Graph* (one per student per sample square) (optional)
- pencils
- crayons
- clipboards (optional)
- calculators (optional)
- *small plastic **sea life toys **OR** pre-cut foam or cardstock animals or shapes
- paper or plastic bowls (optional)

*You can find inexpensive and reuseable plastic sea life toys, pre-cut foam or cardstock animals or shapes at craft stores, Amazon, and toy stores.

**If you use sea life toys/shapes, we recommend you only use fish, crabs, lobsters, shrimp, octopus, squid, and jellies. Remove dolphins, penguins, whales, sea turtles, sharks... etc. Scientists do not collect marine mammals, reptiles...etc. in this kind of sampling for many reasons and if left in, they might confuse kids about deep-sea research and cause unnecessary concern about the larger animals.

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Preparation:

1. Photocopy handouts.

2. Use painter's tape to create a large grid on the floor or on a large piece of butcher's paper. (Be sure to test tape on floor to be sure it does not mar surface.)
   The horizontal lines of your grid will represent different depths. The vertical lines represent location and can be indicated as longitude/latitude, miles between trawls, or simply *A, B, C....*etc.

3. Scatter toys or shapes across grid.

Latitude: 28 Longitude: -88

1500 feet

2000 feet
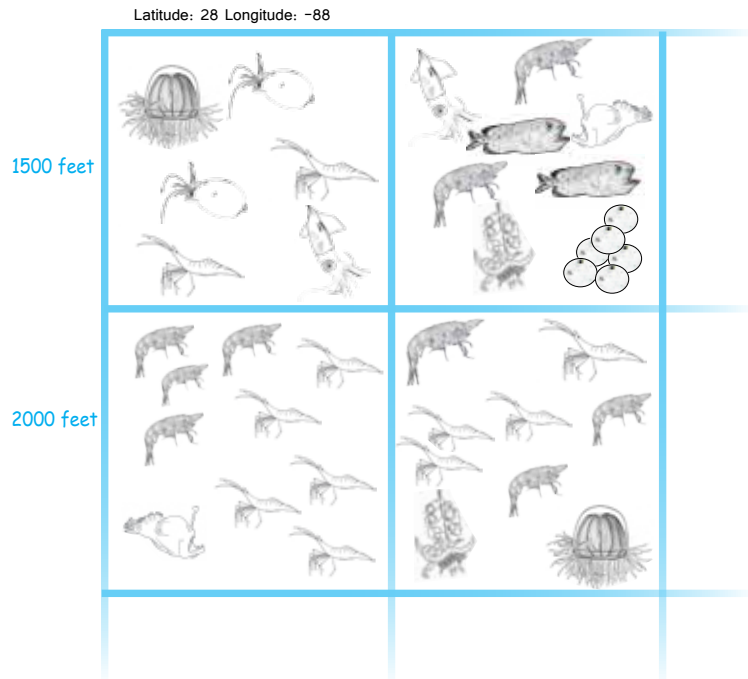
What to do:

1. Divide class into Science Teams.

2. Tell students that an important part of the DEEPEND research is discovering what kinds of animals live in the deep, how many there are, how they migrate up and down in the sea (vertical migration), and whether they travel in and out of the Gulf of Mexico.
Ask students,

   If you were a deep-sea scientist, how would you determine the kinds and number of creatures in the deep?
   What challenges would you face trying to count animals in the deep?
   Do you think you need to count every animal or could you count some and to get an idea of kinds and quantities of deep-sea animals?

Explain that that's what the DEEPEND scientists are doing. When the Deep Horizon Oil spill occurred, scientists had no idea what kinds of animals or how many lived in the deep. Ask, *Why is that a problem?* (Answer: Without that background information, scientists didn't know how or if the oil spill affected the animals, in the short- and long-term.)

3. Tell students they will be working as part of the DEEPEND Science Team to collect, sort, and count deep-sea animals. Each team will be responsible for gathering the information from one square. Be sure students understand how to read the grid. Allow older students the opportunity to describe how the grid (graph) works. For younger students you may need to point to the depth and explain how that indicates how far down the team will collect the sample. All the boxes in that row are the same depth. Point out the location (columns), discuss how the location is for all the boxes in that column.

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4. Give each student a copy of the *Deep-Sea Sample Chart* and a pencil or crayon. Help them fill out the day and time. Point out where they will note the depth and location the sample was collected.

    NOTE: If using generic shapes rather than animal, use the *Deep-Sea Sample Chart* without animal categories. Either draw in category shapes prior to photocopying or have students draw shapes. All teams should use the same categories. Depending on the grade-level, you can determine teams which square a team chooses or allow teams to make the choice. Have teams take turns collecting all the organisms within their square.

5. Have teams identify, sort, and count the creatures from their square. Note each animal with a hash mark in the correct column of their handout.

6. Have students count or tally the quantity of each category they found in their sample.

7. If you have older students, have students create a graph representing the information they gathered about their sample. They can create their own graph or complete and color a *Deep-Sea Sample Graph*.

8. Have teams share their numbers with the other teams.

9. Discuss what they found.
    Ask:
    Do you think you have enough information to determine population and distribution in the deep? Why or why not?
    If there were a scientist what would you do next?

Optional:

10. Return the organisms to the grid, mix them up, remove some species, move some deeper or to shallower water to recreate vertical migration. Hand out *Deep-sea Sample Tracking Chart.* For this round have students use a date 4 months from now or note that it's night instead of day or...etc.
11. Repeat activity.
12. Compare and contrast the first sample with the second. Discuss why the DEEPEND Science Team might find changes from one sampling to another a different time of year or day.

    NOTE: We have included microbes on the list for discussion with older students. Microbiomes are important for plants, animals and the health of the ocean and entire planet. There could be millions of microbes in a very small space. If you include microbes, have the kids multiply the quantity they find by a million, 10 million, or more.

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DEEP-SEA SAMPLE TRACKING CHART

Creep into the DEEP END
WhaleTimes Virtual Team Member Activity

Team: _____ Date: _____ Time: _____

Location: _____ Depth: _____

Cephalopods	Crustaceans	Fish	Jellies	Microbes	Other or not identified

Total

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DEEP-SEA SAMPLE TRACKING CHART

Creep into the DEEP END
WhaleTimes Virtual Team Member Activity

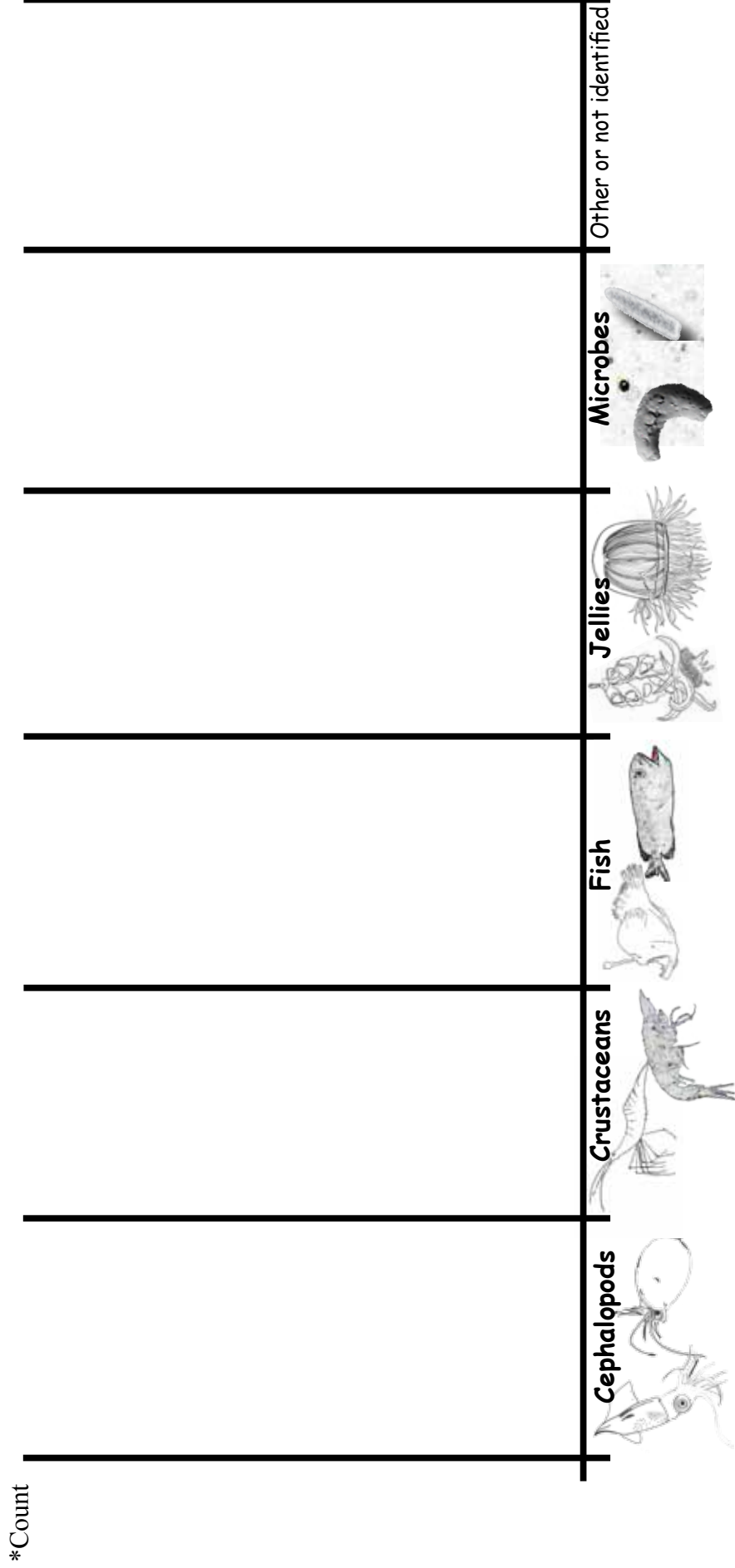Team: _____ Date: _____ Time: _____

Location: _____ Depth: _____

Other or not identified

Total

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Creep into the DEEPEND
WhaleTimes Virtual Team Member Activity

DEEP-SEA SAMPLE GRAPH

Team: _____

Location: _____

Date: _____

Time: _____

Depth: _____

*Count

Cephalopods   Crustaceans   Fish   Jellies   Microbes   Other or not identified

*Label and add the Y axis numbers, then color graph

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Creep into the DEEPEND
WhaleTimes Virtual Team Member Activity

DEEP-SEA SAMPLE GRAPH

Team: _____   Date: _____   Time: _____

Location: _____   Depth: _____

*Count

Other or not identified

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*Label and add the Y axis numbers, then color graph