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| **Lab Activity Title:** | **Marine Zones & Habitats Mural/Diorama** |
| **Submitted by:** | **Jane Schuster** |
| **Recommended Grade Level:** | **9-12** |
| **Discipline:** | **Life Science** |
| **Topic:** | **Habitats, Food Web** |
| **Time Requirement:** | **Can be completed in approximately 10 minutes** |

**Required Materials:**

- 1 piece of butcher paper/display paper (6 foot length) – provided by teacher
- Color photos or drawings of the organisms living in the assigned habitat. (student gathered)
- Markers, crayons, colored pencils
- Glue, scissors

## National Science Standards Alignment

**LS 4c**: Organisms both cooperate and compete in ecosystems. The interrelationships and interdependencies of these organisms may generate ecosystems that are stable for hundreds or thousands of years.

**LS 4d:** Living organisms have the capacity to produce populations of infinite size, but environments and resources are finite. This fundamental tension has profound effects on the interactions between organisms.

**LS 6b**: Organisms have behavioral responses to internal changes and to external stimuli. Responses to external stimuli can result from interactions with the organism's own species and others, as well as environmental changes; these responses either can be innate or learned. The broad patterns of behavior exhibited by animals have evolved to ensure reproductive success. Animals often live in unpredictable environments, and so their behavior must be flexible enough to deal with uncertainty and change. Plants also respond to stimuli.

**LS 4e**: Human beings live within the world's ecosystems. Increasingly, humans modify ecosystems as a result of population growth, technology, and consumption. Human destruction of habitats through direct harvesting, pollution, atmospheric changes, and other factors is threatening current global stability, and if not addressed, ecosystems will be irreversibly affected.

**SPSP 3c**: Humans use many natural systems as resources. Natural systems have the capacity to reuse waste, but that capacity is limited. Natural systems can change to an extent that exceeds the limits of organisms to adapt naturally or humans to adapt technologically.

**SPSP 4a:** Natural ecosystems provide an array of basic processes that affect humans. Those processes include maintenance of the quality of the atmosphere, generation of soils, control of the hydrologic cycle, disposal of wastes, and recycling of nutrients. Humans are changing many of these basic processes, and the changes may be detrimental to humans.

**SPSP 5b:** Human activities can enhance potential for hazards. Acquisition of resources, urban growth, and waste disposal can accelerate rates of natural change.

**SPSP 6e:** Humans have a major effect on other species. For example, the influence of humans on other organisms occurs through land use—which decreases space available to other species—and pollution—which changes the chemical composition of air, soil, and water.

## Lesson Objective

**Students will:**

- Research aspects of your Zone/Habitat, including the physical characteristics and the organisms living on/or around one; and
- Create a mural or diorama replicating that zone, a zone food web, world locations and the threats facing your zone today.

Each group will create their own mural, diorama (model), or combination of both.

Group make-up should try to include a mix of skills: research, writing, organization, and drawing/creating. Groups will consist of 5 or 6 people depending on class size.

The final product will be graded on multiple levels. The scoring breakdown will be included in the specific instructions. Be aware that you will be graded on your facts, accuracy, creativity, neatness, group & individual participation.

## Procedure:

**Design: the basic mural design will show the required information as follows.**

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| Zone food web | Zone community | Threats & maps |

If your group decides to create a diorama, it can replace the community section of the mural. The food web and threats panels would still be required to be part of the project.

*******ALL ORGANISMS IN YOUR ZONE MUST BE IDENTIFIED WITH THEIR COMMON NAME (possible extra credit for correct scientific genus & species names)*******

**Zones & Habitats = Coral Reef, Mangroves & Estuaries, Sandy/Rocky Shores, Open ocean, The Abyss, Hydrothermal Vents, Salt Marsh & Mud Flats**

**Project specifications: maximum points = 72**

**Part 1: Food Web (2 people)**

- Create a drawing of zone food web that includes the following levels of organisms and how they interact. You may use individual color pictures of the organisms, but they must be attached neatly.
    - Primary Producer(s) 2pt
    - Secondary Producer (minimum one) 2pt
    - Primary Consumer (minimum 4 herbivores) 4pt
    - Primary Predator (minimum 3) 3pt

- Secondary Predator (minimum 3) 3pt
- Tertiary (Apex) Predator (minimum 2) 2pt
- Where do humans fit in? 1pt

**17pts**

**Part 2: Zone Community (2 or 3 people)**

- Create a depiction of a fully functioning Zone. This can be a drawing, a collage of pictures (not just one large picture off the web), or a diorama/model (realistic). ***** ALL ORGANISMS IN YOUR ZONE MUST BE IDENTIFIED WITH THEIR COMMON NAME (possible extra credit for correct scientific genus & species names)***** If your zone does not contain a particular group you must state that on the back of your project
  - 5 different types of plants/plant materials 5pt
  - Cnidaria (minimum 2) 2pt
  - Mollusca
    - Gastropoda (minimum 1) 1pt
    - Bivalvia (minimum 2) 2pt
    - Cephalopoda (minimum 2) 2pt
  - Arthropoda
    - Crustacea (minimum 4) 4pt
  - Echinodermata
    - Asteroidea (minimum 2) 2pt
    - Echinoidea (minimum 2) 2pt
  - Chondrichthyes (minimum 2) 2pt
  - Osteichthyes (minimum 5) 5pt
  - Reptilia (minimum 1) 1pt
  - Aves (minimum 1) 1pt
  - Mammalia (minimum 1) 1pt
  - Originality & design & neatness 5pt
  - Realistic depiction 5pt
  - Documented Individual participation (who did what) 5pt

**45pt**

**Part 3: Threats & Maps (1 person)**

- Create an drawing that reflects
  - 3 natural threats/predators of Zones 3pt
  - 2 human threats to Zones (be specific) 2pt
  - 3 ways/measures to protect zone 3pt
- Show a map(s) indicating
  - Locations of zone worldwide 1pt
  - Locations of zone around Florida (if found) 1pt

**10pt**

**Recommended Ward's Science Materials**

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| The BiOrb Fish Tank | Item No. 219408 |
| Biomes DVD Set | Item No. 1950050 |
| Marine Hermit Crabs, Live | Item No. 876050 |
| Interactive Whiteboard Science Lesson CD: Food Chains and Food Webs | Item No. 745359 |