

Design Your Own Invertebrate

Create and Present Your Own Aquatic Invertebrate

KNOWLEDGE

- Identify how abiotic factors affect organisms within an ecosystem
- Understand how organisms are adapted to live in different environments □ Understand that different ecosystem have different abiotic stressors

ACTIVE

- Students will have to create and colour their own posters
- Students may have to present these posters at the end of class □ Possible beach/nature walk

TIME	GROUP SIZE	LOCATION	GRADE LEVEL	EQUIPMENT
As long or short as you'd like.	3-4	Classroom	4-7	Paper Glue sticks Pencil Crayons Power point/Overhead projector Tools to research their invertebrate Other arts and crafts supplies
DEBRIEF/REFLECTIVE COMPONENT			HELPFUL TIPS	
<ul style="list-style-type: none"> • How do abiotic factors differ between ecosystems? • How are certain invertebrates adapted to deal with the abiotic factors of their ecosystem? • Where would an invertebrate likely live based on its adaptations? • How is the design of your animal related to its habitat? • What are some issues facing your invertebrate? • How will climate change affect it? 			<ul style="list-style-type: none"> □ If it is possible, it would work best if your class was able to visit an actual aquatic environment (tide pools, streams, rivers, lakes). 	

OCEAN LITERACY PRINCIPLES

1 – The Earth has one big ocean with many features.

- 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.
- h. Although the ocean is large, it is finite, and resources are limited.

5 – The ocean supports a great diversity of life and ecosystems.

- a. Ocean life ranges in size from the smallest living things, microbes, to the largest animal on Earth, blue whales.
- c. Most of the major groups that exist on Earth are found exclusively in the ocean and the diversity of major groups of organisms is much greater in the ocean than on land.
- e. The ocean provides a vast living space with diverse and unique ecosystems from the surface through the water column and down to, and below, the seafloor. Most of the living space on Earth is in the ocean.
- f. Ocean ecosystems are defined by environmental factors and the community of organisms living there. Ocean life is not evenly distributed through time or space due to differences in abiotic factors such as oxygen, salinity, temperature, pH, light, nutrients, pressure, substrate, and circulation. A few regions of the ocean support the most abundant life on Earth, while most of the ocean does not support much life.
- h. Tides, waves, predation, substrate, and/or other factors cause vertical zonation patterns along the coast; density, pressure, and light levels cause vertical zonation patterns in the open ocean. Zonation patterns influence organisms' distributions and diversity.

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.

Setup

1. Start by having the students brainstorm the types of environmental (abiotic) factors that affect organisms living within the coastal marine ecosystem.

2. Show your class a photo, overhead, or power point of a shoreline ecosystem found on the coast, or your regional waterway (or take them for a beach/waterway walk for a short introduction if possible)
3. Have students consider that not all parts of this environments are uniform, there are different ecosystems within (intertidal zones, or different parts of a stream/riparian area)
4. Have the students imagine that they lived in this environment and consider the environmental or abiotic factors that may affect them during their daily existence.
5. Discuss with your class, what abiotic factors might be affecting these organisms in their daily lives? What are the outcomes of these abiotic factors?
6. Have students work in groups (3-4) to design an invertebrate that is adapted to tolerate at least two of these factors.
7. Randomly assign each group the two factors they have to work with.
8. Have the students draw their design on poster paper and then have them present it to the class.
9. Guidelines for students to follow:
 - a. How is your invertebrate adapted to tolerate these two factors?
 - b. On your design, label the structures your invertebrate has to help it tolerate these two factors.
 - c. Add explanations of how the structures operate to both the class and to the teacher.
10. Classroom activities:
 - a. Where would this organism live?
 - b. Explain how its design is related to its habitat.