



Title: Invent an Invertebrate

Adapted from *CoastWatch Activities*, Center for Alaskan Coastal Studies <http://www.akcoastalstudies.org/>.

Theme: Animals and plants have unique adaptations to survive in the intertidal zone.

Objectives:

- Students will understand the challenges of surviving in the intertidal zone.
- Students will create an animal specially adapted to survive in the intertidal zone.
- Students will recognize the unique adaptations of intertidal creatures.

Duration: 30-60 minutes

Age Range: 4th-12th Grade

Materials:

- Paper
- Pens or Pencils
- Miscellaneous art, craft, and household supplies
- Envelopes
- Stamps

Background:

Many intertidal invertebrates were heavily impacted by the *Exxon Valdez* Oil Spill and ensuing clean-up. Life in the intertidal presents many challenges even without an oil spill, and animals and algae living there have developed many adaptations to address these challenges. *Invent and Invertebrate* asks students to focus on some of these stressors and examine how organisms might adapt to them. This activity is an excellent way for students to review the adaptations that they learned about during intertidal exploration activities and to synthesize their knowledge. If appropriate for your class, you can ask students to give their animal an adaptation to deal with human impacts like oil or marine debris.

Preparation:

Compile a bin of assorted kitchen, household, recreation, and/or craft items: sponges, spatulas, whisks, tongs, sheets, feather dusters, scarves, fabric scraps, ribbons, scarves, helmets, gloves, knee pads, etc.

Introduction:

Have the class brainstorm a list of the challenges an organism faces living in a coastal habitat. You may want to distinguish between challenges faced in any coastal habitat and challenges unique to specific habitats. For example "avoiding being eaten" is general to all habitats, but "avoiding being washed away by waves" is more specific to rock and sand coast habitats. This is a great time to brainstorm and review some of the real-life adaptations already encountered in the intertidal zone.

Activities & Procedures:

Choose 3-8 challenges that each invented invertebrate will have to address through adaptations (avoiding predation, getting food, staying wet, large waves, etc.) If you would like, you can ask students to give their invertebrate one or more adaptations for dealing with human impacts (oil spills, marine debris, etc.) Instruct students to also provide a name for their invertebrate.

Break students into 3-5 groups. Challenge students to work with the materials provided to design and construct a never-before-seen animal that is adapted to the conditions and challenges of a specific coastal habitat recently visited (sandy, rocky, salt marsh, or tidal mudflat). Decide whether students will be creating the creature using only the props provided (art/craft activity) or by dressing up a member of the group as the organism (fashion show activity). Have students sketch and list the name and adaptations for their group's invertebrate.

Each group should present their organism to the class and discuss the animal's adaptations to the intertidal zone. If you have chosen to have students dress up a member of their group, be prepared for some silliness.

Wrap-up:

Discuss why adaptations are important and how animals use adaptations. Ask each group to share how they decided what adaptations to give their new organism and the factors that were considered. Remind students that adapting to physical or biological stresses and opportunities takes place over hundreds or thousands of years. An animal can't just adapt overnight to a challenge like an oil spill, but people CAN adjust their behaviors and habits very quickly. Ask students to brainstorm a list of ways they could adjust their own behavior to reduce the human impact challenges encountered by organisms in local ecosystems. Have students write a letter to themselves about one behavior they will change. Return or mail the letter to students a few weeks or months later.

Evaluation:

Assess student understanding of adaptations based on the characteristics of their

invented invertebrates and presentations. Observe participation, cooperation and respectful tone during group work.

Invent an Invertebrate Standards

Concepts of Life Science: Students develop an understanding of the concepts, models, theories, facts, evidence, systems, and processes of life science.

SC1

Students develop an understanding of how science explains changes in life forms over time, including genetics, heredity, the process of natural selection, and biological evolution.

The student demonstrates an understanding of how science explains changes in life forms over time, including genetics, heredity, the process of natural selection, and biological evolution by:

[6] SC1.1 recognizing sexual and asexual reproduction

[6] SC1.2 recognizing that species survive by adapting to changes in their environment

SC2

Students develop an understanding of the structure, function, behavior, development, life cycles, and diversity of living organisms.

The student demonstrates an understanding of the structure, function, behavior, development, life cycles, and diversity of living organisms by:

[5] SC2.1 identifying and sorting animals into groups using basic external and internal features

[4] SC2.2 describing the basic characteristics and requirements of living things

[5] SC2.2 explaining how external features and internal systems (i.e., respiratory, excretory, skeletal, circulatory, and digestive) of plants and animals may help them grow, survive, and reproduce

[6] SC2.2 identifying basic behaviors (e.g., migration, communication, hibernation) used by organisms to meet the requirements of life

SC3

Students develop an understanding that all organisms are linked to each other and their physical environments through the transfer and transformation of matter and energy.

The student demonstrates an understanding that all organisms are linked to each other and their physical environments through the transfer and transformation of matter and energy by:

[4] SC3.1 identifying examples of living and non-living things and the relationship between them (e.g., living things need water, herbivores need plants)