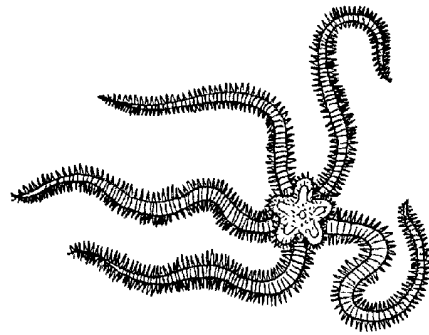


# LIFE IN THE TIDAL ZONE

FOR SEA: Investigating Marine Science - Grade 1

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### Unit I: Saltwater

- 1. Salty Water .....** **35**  
Students make salt water, taste it at different depths with a straw; then evaporate drops of salt and fresh water.
- 2. Saltwater Floaters.....** **45**  
Students sink an egg in a cup of freshwater; then add salt until the egg floats. They check the buoyancy of familiar objects - carrot, nut, pebble.
- 3. Water as a Weight Lifter.....** **51**  
Students test to see how heavy a bag of pebbles is when it is submerged, versus when not submerged.

### Unit 2: Hermit Crabs

- 1. Intertidal Tales .....** **55**  
Students role play a beach visit practicing beach etiquette (turned stones should be turned back, animals should be left in their homes...) and more.
- 2. Observing Hermit Crabs .....** **63**  
Students observe live crabs move, hide, and scurry after food; then students enact crab behavior.
- 3. Borrowed Shells .....** **67**  
Students use literature, song and writing to examine how hermit crab adaptations help these animals meet the challenges of their habitat.

- 4. Clothespin Claws ..... 75**  
 Students model foraging behavior before and after losing a clothespin claw, making bar graphs to gauge foraging efficiency.

### Unit 3: Sea Anemones

- 1. Sea Anemones ..... 81**  
 Students learn anemone anatomy, then enact anemone behaviors at high and low tide.
- 2. Making Sea Anemones ..... 91**  
 Students design and build a paper anemone model that has retractable tentacles.

### Unit 4: Barnacles

- 1. Barnacles ..... 97**  
 Students observe live barnacles (or a film) dry (low tide), then submerged (high tide), and draw inferences from observations.
- 2. Have or Do? ..... 111**  
 Students are asked to distinguish between barnacle structures ("Have") and barnacle behaviors ("Do").
- 3. High and Dry ..... 115**  
 Students observe the desiccation of vegetables left in a dry pan (low tide), and compare with vegetables submerged in another pan (high tide).
- 4. Drying on the Line ..... 123**  
 Students compare the drying rate of a folded paper towel to that of an unfolded paper towel, to explore the effects of animal shape on desiccation rate.

### Unit 5: Limpets and Chitons

- 1. Limpets and Chitons ..... 127**  
 Students observe differences between chitons and limpets, and infer the adaptive values of the differences.
- 2. Hold On ..... 139**  
 Given an array of household items, students predict which items will be least affected by the force of waves; then test by spraying with a garden hose.

- 3. Life on the Rocks..... 143**  
Students design a "holdfast" for a "limpet" (piece of sponge) and attach it to a fence. Designs are tested by throwing buckets of water on the "limpets".
- 4. Creating Chitons..... 145**  
Each student forms eight clay shell plates, and then overlaps them to form a model of a chiton.

## Unit 6: Sea Stars

- 1. Sea Stars ..... 149**  
Students study diagrams of sea stars that show their parts, their variety, and how they eat clams.
- 2. Sea Star Math ..... 161**  
Counting by fives, students add the number of total rays in a group of sea stars.
- 3. Creating Graphs..... 163**  
The great variety of sea animals provides a wonderful device for introducing representational graphs.

## Unit 7: Octopus

- 1. Octopus ..... 165**  
Students form a "tentacle", passing a "crab" from tentacle tip to octopus mouth, and also model octopus jet propulsion.
- 2. Octopus Changes ..... 171**  
Students draw an octopus using disappearing ink to model camouflage behavior.

## Unit 8: Seaweeds

- 1. Seaweeds Are Plants of the Sea ..... 175**  
Students compare the form and function of seaweed to land plants. For locales with seaweeds, plans are included for "sun prints" and pressed seaweeds.
- 2. Seaweed Anyone? ..... 189**  
Students look for algin and other seaweed derivatives on food ingredient labels to learn that they are present in many common foods, such as ice cream.

- 3. Interdependence ..... 199**  
Students make paper models of land and sea based food chains; then assume the roles of sun, plants and animals and link together in a food web with yarn.

## **Unit 9: Tidepool Model**

- 1. Papier-mâché Tidepools ..... 209**  
Students use their new knowledge of the sea and its life to construct a life-sized papier-mâché tidepool, populated with clay animals and plants.