Between a Rock and a Wet Place

Tide Pool Adaptations Program
Grades K - 3

Yaquina Head Outstanding Natural Area
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Between a Rock and a Wet Place

Objectives:

Students will be able to:

- Define adaptation.
- Identify tide pool organisms (plants and animals) and their unique adaptations.
- Recall tide pool rules during the “Rules of the Pools” shout out
- Verbalize or otherwise document a meaningful experience that occurred during the field trip.

On-Site Activities:

- Review “Rules of the Pools.”
- Duplication Game.
- Tide Pool Scavenger Hunt
- Who’s in the Pools
- Conclusion.

Pre-Visit Activities:

- Teach tide pool rules by playing “Shout Out.”

- Adapting to the Pools - By completing a reading and coloring activity, students become familiar with adaptations that help tide pool organisms live on the rocky shores. Students will be able to define an adaptation, identify 10 tide pool animals and plants, and learn at least one physical or behavioral adaptation for each species.

- Vocabulary – Use in conjunction with the “Adapting to the pools” activity, to build spelling and vocabulary and scientific skills; Written for both K-1 and 2-3 grade levels.

- Consider components of sea-YaquinaCardsActivityProgram2014.pdf: By completing a mock monitoring experiment simulating a tide pool environment, students will define and discuss the principle of species richness, become familiar with data collection procedures paralleling on-site field trip monitoring activities, collect and compile data, identify tide pool invertebrate and algae species, and make a scientific hypothesis (see “For Teachers” webpage then link to “SeaCrets of Tide Pools” program).

Post-Visit and Evaluative Activities:

- Dear Ranger - Students create a letter to a ranger: writing and drawing about their field trip experience.

- Make a Poem - Students create a cinquain or vertical poem.

- Adaptations Crossword and Key - Upon returning to the classroom, student’s will use the knowledge they gained from the tide pool program to complete a crossword puzzle. The puzzle gives clues describing adaptations of tide pool animals; The students figure out which animal the clue describes. (Includes the blank crossword and a teachers’ key.)
Between a Rock and a Wet Place
Oregon Educational Standards

Grade K:

**K.1 Interaction and Change:** The natural world includes living and non-living things.
- **K.1L.1** Compare and contrast characteristics of plants and animals.

**K.3 Scientific Inquiry:** Science explores the natural world through observation.
- **K.3S.1** Explore questions about living and non-living things and events in the natural world.
- **K.3S.2** Make observations about the natural world.

Grade 1:

**1.1 Structure and Function:** Living and non-living things have characteristics and properties.
- **1.1L.1** Compare and contrast characteristics among individuals within one plant or animal group.

**1.2 Interaction and Change:** Living and non-living things interact.
- **1.2L.1** Describe the basic needs of living things.

**1.3 Scientific Inquiry:** Science explores the natural world using evidence from observations.
- **1.3S.1** Identify and use tools to make careful observations and answer questions about the natural world.

Grade 2:

**2.1 Structure and Function:** Living and non-living things vary throughout the natural world.
- **2.1L.1** Compare and contrast characteristics & behaviors of plants and animals and the environments where they live.

**2.2 Interaction and Change:** Living and non-living things change.
- **2.2L.1** Describe life cycles of living things.

**2.3 Scientific Inquiry:** Scientific inquiry is a process used to explore the natural world using evidence from observations.
- **2.3S.1** Observe, measure, and record properties of objects and substances using simple tools to gather data and extend the senses.

Grade 3:

**3.2 Interaction and Change:** Living and non-living things interact with energy.
- **3.2L.1** Compare and contrast the life cycles of plants and animals.

**3.3 Scientific Inquiry:** Science inquiry is a process used to explore the natural world using evidence from observations.
- **3.3S.2** Use the data collected from scientific investigation to explain the results and draw conclusions.

OCEAN LITERACY: The Essential Principles of Ocean Sciences

# 5 The ocean supports a great diversity of life and ecosystems.
- d. Ocean biology provides many unique examples of life cycles, adaptations and important relationships among organisms that do not occur on land.
- e. The ocean is three-dimensional. Offering vast living space and diverse habitats.

# 6 The ocean and humans are inextricably interconnected.
- d. The ocean is a source of inspiration, recreation, rejuvenation and discovery.
- e. Humans effect the ocean in a variety of ways.
Between a Rock and a Wet Place

Instructions
Between a Rock and a Wet Place

During the “Between a Rock and a Wet Place” program, students participate in activities intended to give primary grade students the opportunity to explore and learn about the unique adaptations of tide pool plants and animals. Activities are designed to insure safety for both students and the tide pools while creating a head, hands, and heart learning environment.

Pre-visit Preparation

Please familiarize yourself with the Field Trip Preparation and Contract in the Teacher’s Packet located on the BLM website:

http://www.blm.gov/or/resources/recreation/yaquina/edu-plan-visit.php

Use the developed pre-visit activities as available, or teach the following concepts before your visit:

- Explain tides and tide pools.
- Define adaptations.
- Identify the ten tide pool species examined in this program. (Refer to Master Page 10)
- Describe at least one physical or behavioral adaptation for each tide pool species.

Introductions and Rules of the Pools (approximately 15 minutes)

After a short bus orientation, students proceed to the Lighthouse Garden where rangers review the “Rules of the Pools-Shout Out” (tide pool etiquette and safety) through a fun and dynamic skit. Some “bad rangers” exemplify bad tide pool behaviors, and then are corrected by the “good ranger” who instructs the group about applicable rules. The rules will be reinforced by “Shout Out” in which rangers will shout the first part of the rule and the students will shout the second part of the rule.

<table>
<thead>
<tr>
<th>Rule</th>
<th>Ranger Shouts</th>
<th>Student Shout Reply</th>
</tr>
</thead>
<tbody>
<tr>
<td>Walk on Bare Rocks</td>
<td>Walk on</td>
<td>BARE ROCK</td>
</tr>
<tr>
<td>Don’t pick up alive critters</td>
<td>Alive or attached</td>
<td>DON’T PICK IT UP</td>
</tr>
<tr>
<td>OK to touch gently</td>
<td>Touch</td>
<td>GENTLY</td>
</tr>
<tr>
<td>No Collecting</td>
<td>Collect only</td>
<td>TRASH</td>
</tr>
<tr>
<td>Leave sticks and stones</td>
<td>Sticks and Stones</td>
<td>LEAVE EM ALONE</td>
</tr>
</tbody>
</table>

RULES OF THE POOLS - SHOUT OUT
Duplication Game *(approximately 15 minutes)*

Upon completion of the “Tide Pool Rules” skit, students and chaperones break into small groups pre-determined by the teacher. These groups are then assigned to a ranger. Ranger-led groups proceed to the stairway platforms toward cobble beach and participate in a memory game introducing tide pool animals and their adaptations.

Students gather around the ranger and briefly peek into a box containing representations of various tide pool species. The box is then covered and one at a time, students are called on to remember the name of the represented species. Students recall and describe the items they saw and the ranger discusses the various adaptations and characteristics of each species as they remember them. *(Duplication activity adapted from Joseph Cornell’s *Sharing Nature with Children*, 1979)*

Adaptation Scavenger Hunt? *(approximately 30 minutes)*

On Cobble Beach, students explore the tide pools discovering the adaptations of tide pool plants and animals using inquiry questions. Each chaperone receives An Adaptations Scavenger Hunt card *(Master Pages 10)* and Inquiry Question Cards *(Master Pages 11-12)*. In the tide pools, rangers and chaperones help students find each animal on the card, one at a time, then explore and discuss each species using Inquiry Question Cards as a reference.

- Why are Sea Stars different colors?
- What do Sea Stars eat?
Who’s in the Pools *(approximately 20 minutes)*

1. After gathering on shore, review tide pool plants and animals and their associated adaptations. The ranger or teacher models the activity by reading a card containing various clues describing a tide pool organism *(Refer to Master Pages 13-14)*. After all of the clues are read, the students identify which animal is being described.

2. Assign “Who’s in the Pools” clue cards to each chaperone or work group; to be read by an adult or accomplished student reader. After discovering which animal their card describes, students help to find a picture of their corresponding tide pool plant or animal (hiding it so other groups can’t see it).

3. Once their assigned species is identified, chaperones help students prepare for a show and tell (or charades) of their tide pool animal.

4. Students from each chaperone-led group present their tide pool plant or animal with each student describing a unique adaptations or fact.

*(Activity adapted from Animal Clue Game from Joseph Cornell’s *Sharing Nature with Children II*, 1989.)*

Conclusion *(approximately 10-15 minutes)*

The program concludes with a reflective activity, decided upon by the ranger. Rangers may choose to play a game such as tide pool animal charades, use a talking-stick to discuss the day’s events, or do a quiet solo/group activity.
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Master Pages
<table>
<thead>
<tr>
<th>ADAPTATIONS SCAVENGERT HUNT</th>
</tr>
</thead>
<tbody>
<tr>
<td>BARNEY BARNACLE</td>
</tr>
<tr>
<td>ANDY ANEMONE</td>
</tr>
<tr>
<td>CAROLINE CORALLINE</td>
</tr>
<tr>
<td>URSULA URCHIN</td>
</tr>
<tr>
<td>HAROLD HERMIT</td>
</tr>
<tr>
<td>MARTHA MUSSEL</td>
</tr>
<tr>
<td>ROCKY ROCKWEED</td>
</tr>
<tr>
<td>SALLY SEA STAR</td>
</tr>
<tr>
<td>STEVIE SCULPIN</td>
</tr>
<tr>
<td>TOMMY TURBAN</td>
</tr>
</tbody>
</table>
| **Giant Green Anemone** | • Why are Giant Green Anemones green?  
• Why are Anemones sticky when you touch them?  
• What do Anemones eat?  
• Why do Anemones cover themselves with rock and shell pieces? |
|------------------------|----------------------------------------------------------|
| **Purple Sea Urchin**   | • Why do Purple Sea Urchins have spines?  
• Why are the Purple Sea Urchins “sitting” in holes in the tide pools? What makes those holes?  
• Where is the mouth of a Sea Urchin? How do they get food to their mouth? What do they eat? |
|------------------------|----------------------------------------------------------|
| **Hermit Crab**        | • Do Hermit Crabs grow their own shells? Where do Hermit Crabs get their shells?  
• What do Hermit Crabs eat?  
• What do Hermit Crabs use their claws for?  
• How big can hermit crabs get? |
|------------------------|----------------------------------------------------------|
| **California Mussel**  | • Why do Mussels live in large groups (beds)?  
• How do Mussels stay attached to the rocks?  
• Why are Mussels blue?  
• How do Mussels eat? Are there animals that eat Mussels? |
|------------------------|----------------------------------------------------------|
| **Coralline Algae**    | • Why is Coralline Algae pink?  
• Why does Coralline Algae look like coral?  
• How does Coralline Algae get food?  
• Can you think of any animals that would eat Coralline Algae? |
### Acorn Barnacle
- How do Barnacles eat?
- Can Barnacles move? How do Barnacles stay attached to the rocks?
- Where do you see barnacles? Can you think of any animals on which they can be found?

### Tide Pool Sculpin
- Why are Tide Pool Sculpins hard to see?
- Can a Tide Pool Sculpin live out of the water?
- Why is the Tide Pool Sculpin “resting” or laying on the bottom of the tide pool?
- How big can a Tide Pool Sculpin get?

### Sea Star
- Why are Sea Stars different colors?
- Why are some of the Sea Stars “humped-up” on the rocks or in the tide pools?
- Where is the mouth of Sea Star? How do they eat?
- What do Sea Stars eat?

### Black Turban Snail
- Are all Turban Snails black? Why are some pink?
- What do Turban Snails eat?
- How fast can Turban Snails move?
- Can you think of an animal that is a Turban Snail imposter?

### Rockweed
- Why is Rockweed green?
- How does Rockweed get its food?
- Can you find pockets of air in the leaves? What do these air pockets do?
<table>
<thead>
<tr>
<th>Who's in the Pools?</th>
<th>Clue #1: I look like a donut when I am closed up.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Clue #2: I like to cover myself with pieces of shell to protect myself from the sun.</td>
</tr>
<tr>
<td></td>
<td>Clue #3: I can grab food with my sticky tentacles.</td>
</tr>
<tr>
<td></td>
<td>Clue #4: I get my green color from the algae living in my tissue.</td>
</tr>
<tr>
<td></td>
<td>Clue #5: I look like a flower when I open up.</td>
</tr>
<tr>
<td>Enomena ydnA!</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Who's in the Pools?</th>
<th>Clue #1: I use my leaves to capture sunlight and make my own food.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Clue #2: I can be found only in the tide pools.</td>
</tr>
<tr>
<td></td>
<td>Clue #3: I look like coral.</td>
</tr>
<tr>
<td></td>
<td>Clue #4: My color help to protect myself from predators.</td>
</tr>
<tr>
<td></td>
<td>Clue #5: I am one of the only pink plants in the tide pools.</td>
</tr>
<tr>
<td>Eagla enillaroC!</td>
<td></td>
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</tbody>
</table>

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<tr>
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<tbody>
<tr>
<td></td>
<td>Clue #2: My claws are used for protection and for eating.</td>
</tr>
<tr>
<td></td>
<td>Clue #3: I wear an empty snail shell to protect my soft body.</td>
</tr>
<tr>
<td></td>
<td>Clue #4: I sometimes fight my friends for their shells.</td>
</tr>
<tr>
<td></td>
<td>Clue #5: Some people might think I’m crabby.</td>
</tr>
<tr>
<td>Barc timreh dloraH!</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Who's in the Pools?</th>
<th>Clue #1: I move really slowly, but that’s okay because not very many things want to eat me.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Clue #2: I use my tube feet to move food into my mouth.</td>
</tr>
<tr>
<td></td>
<td>Clue #3: I cover myself with shells and rocks for protection.</td>
</tr>
<tr>
<td></td>
<td>Clue #4: I live in a hole that I carve out of the rock with my sharp teeth.</td>
</tr>
<tr>
<td></td>
<td>Clue #5: I am a purple ball with spikes.</td>
</tr>
<tr>
<td>Nihcrü alusrU!</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Who's in the Pools?</th>
<th>Clue #1: I don’t mind spending most of my time out of the water.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Clue #2: I have a blue-black shell.</td>
</tr>
<tr>
<td></td>
<td>Clue #3: I hold on to rocks with threads that act like glue.</td>
</tr>
<tr>
<td></td>
<td>Clue #4: I live with all of my friends in a big bed.</td>
</tr>
<tr>
<td></td>
<td>Clue #5: Many people eat me in restaurants.</td>
</tr>
<tr>
<td>Lessum ahtraM!</td>
<td></td>
</tr>
</tbody>
</table>
CRITTER CARDS

Who's in the Pools?

Clue #1: I spend a lot of time out of the water waiting for the tide to come back in.

Clue #2: I build my own fort out of sand and stone to protect myself.

Clue #3: When the tide comes back in I will stick my legs out to grab food.

Clue #4: I attach myself to the rocks by gluing my head to them.

Clue #5: During low tide I close up my volcano shaped shell to stay moist.

Ellegnaq Vendrahi! Volcano shaped shell to stay wet. Clue #5: During low tide I close up my shell to keep myself moist. Clue #4: I attach myself to the rocks by gluing my head to them. Clue #3: When the tide comes back in I will stick my legs out to grab food.

Sally Sea Star

Harold Hermit Crab

Coralline Algae

Andy Anemone

Card #10

Card #1

Card #2

Card #3

Card #4

Card #5

Card #6

Card #7

Card #8

Card #9

Who's in the Pools?

Clue #1: I am hard to see because my different colors match the rocks and plants around me.

Clue #2: Although I am small, I am a big meat eater.

Clue #3: I am a great swimmer.

Clue #4: I have to live in water or I will die.

Clue #5: I am the most common fish you will probably see in the tide pools.

Deewkcor Ykcor!

Nipples Giveaways!

Lians Nabrut YmmoT!

Who's in the Pools?

Clue #1: I use my green leaves to capture sunlight and make my own food.

Clue #2: I use air sacs in my leaves to help me float.

Clue #3: My leaves look like fingers and allow me to move freely in the tide.

Clue #4: I usually find in the high tide zone, closer to the shore.

Clue #5: I am a weed of the sea that grows on rocks.

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Who's in the Pools?

Clue #1: I am a tubenail that live in the rocks.

Clue #2: I have two arms and am able to help me stick to the rocks.

Clue #3: My leaves look like fingers and help me eat.

Clue #4: Each of my arms has hundreds of tube feet to help me stick to the rocks.

Clue #5: I use my head to open them and use my legs to keep them open. My feet are my favorite food.

Clue #4: I live to be 20-30 years old and use my legs to keep them open.

Clue #3: When the tide goes out I close my house is a black shell that I use for protection.

Clue #2: I am a small, I am a star shaped fish and I am the most common fish you will probably see in the tide pools.

Card #10

Card #1

Card #2

Card #3

Card #4

Card #5

Card #6

Card #7

Card #8

Card #9

Who's in the Pools?

Clue #1: I am a great swimmer.

Clue #2: I have hard skin that feels like sandpaper to keep moisture in.

Clue #3: Mussels are my favorite food and I use my tube feet to open them.

Clue #4: Each of my arms has hundreds of tube feet to help me stick to the rocks.

Clue #5: I have five arms and I am shaped like a star.

Card #10

Card #1

Card #2

Card #3

Card #4

Card #5

Card #6

Card #7

Card #8

Card #9

Who's in the Pools?

Clue #1: I am a weed off the sea that grows in the rocks.

Clue #2: I am usually found in the high tide zone, closer to the shore.

Clue #3: When the tide goes out I close my house.

Clue #4: I cling to rocks with my strong foot when the tide comes in.

Clue #5: I am the most common fish you will probably see in the tide pools.

Card #10

Card #1

Card #2

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Who's in the Pools?

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