

Sea-Crets of Tidepools

4th- 5th grade Intertidal Species and Zonation Program



Yaquina Head Outstanding Natural Area
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Sea-Crets of Tidepools

Objectives:

- Identify at least 10 tidepool organisms and their associated “habitat/zone.”
- Define and discuss zonation
- Recall tidepool rules and discuss their importance
- Create and test a hypothesis: In which zone will specific invertebrates be found?
- Create an artistic representation of tid pool zonation (Observing a natural system through different lenses: Artist, scientist, etc.)
- After quietly observing a natural system, recall personal observations and/or appreciation.
- Identify at least one strategy to help “steward” the tidepool ecosystem.

Pre-Visit Activities:

- *Intertidal Species Cards* - Identify and/or review tidepool organisms
- *Zoning Out* - Define and discuss Intertidal Zonation
- *Hypothesize Me a Zone* - Pre-visit Assessment
- *Shout Out* - Review tidepool rules

On-Site Activities:

- Review “Rules of the Pools”
- *Draw Me a Zone* (Observe, draw and define tidepool zones on Seal Rock)
- Review tidepool organisms on *Find Me a Zone* worksheet and, if needed, hypothesis in which zone species are found.
- *Find Me a Zone* - Tidepool Scavenger Hunt
- *Find Me a Zone* - Review and Summary
- Individual Quiet-Reflection Time
- Ranger Wrap-Up

Proposed Post-Visit Activities:

- *Hypothesize Me a Zone* - Post-visit Assessment
- *Critter-cal Thinking* activity or variation.
- Tidepool Reflections: Summarize experiences through writing, artwork or poetry. (See *Student Adventure Book*)
- Propose at least one way to help preserve and protect our tide pool ecosystems.
- Participate in a beach clean-up

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Oregon Educational Standards

Grade 4:

4.1 Structure and Function: *Living and non-living things can be classified by their characteristics and properties.*

- 4.1L.1 Compare and contrast characteristics of fossils and living organisms.

4.2 Interaction and Change: *Living and non-living things undergo changes that involve force and energy.*

- 4.2L.1 Describe the interactions of organisms and the environment where they live.

4.3 Scientific Inquiry: *Scientific inquiry is a process of investigation through questioning, collecting, describing, and examining evidence to explain natural phenomena and artifacts.*

- 4.3S.1 Based on observations identify testable questions, design a scientific investigation, and collect and record data consistent with a planned scientific investigation.
- 4.3S.2 Summarize the results from a scientific investigation and use the results to respond to the question being tested.

Grade 5:

5.1 Structure and Function: *Living and non-living things are composed of related parts that function together to form systems.*

- 5.1L.1 Explain that organisms are composed of parts that function together to form a living system.

5.2 Interaction and Change: *Force, energy, matter, and organisms interact within living and nonliving systems.*

- 5.2L.1 Explain the interdependence of plants, animals, and environment, and how adaptation influences survival.

5.3 Scientific Inquiry: *Scientific inquiry is a process of investigation based on science principles and questioning, collecting, describing, and examining evidence to explain natural phenomena and artifacts.*

- 5.3S.1 Based on observations and science principles, identify questions that can be tested, design an experiment or investigation, and identify appropriate tools. Collect and record multiple observations while conducting investigations or experiments to test a scientific question or hypothesis.
- 5.3S.2 Identify patterns in data that support a reasonable explanation for the results of an investigation or experiment and communicate findings using graphs, charts, maps, models, and oral and written reports.

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Field Trip Outline

SEA-CRETS OF TIDE POOLS

4th-5th Grade Program

Lesson Overview:

Students will participate in activities including skits, artwork, hands-on exploration, and discussions with an emphasis on using their five senses to discover different zones and habitats within the intertidal area.

Starting with a dramatic skit, students will learn about zonation and review the “rules of the pools.” Dividing into ranger-led groups, students will create an artistic representation while observing different zones of the intertidal area. Descending to Cobble Beach, students will complete a scavenger hunt by finding and observing species within each zone. Returning to shore, rangers will lead a lively review of student results, before introducing a reflective activity that allows students personal time to reflect in nature. To conclude, students will share their thoughts and experiences while suggesting ideas for stewardship of our natural lands.

Arriving at Yaquina Head

Upon arrival at Yaquina Head, please check-in at the Entrance Station and find out where you’ll be meeting the Education Staff. A ranger will board the bus, welcome your group, and give further instructions about how to proceed.

Introductions and Rules of the Pools (*Entire Group - Lighthouse Garden Area*)

After disembarking, students will proceed to the Lighthouse Garden for a large-group, presentation about the “Tide Pool Rules” (tide pool etiquette and safety) entitled “Good Ranger - Bad Ranger.” In this short skit, some of the rangers will exemplify bad tide pool behaviors and then be corrected by the “good ranger” who will instruct the entire group on the associated correct behavior. The entire skit will conclude with a spirited “shout out”, which will serve as the review of the rules.

RULES OF THE POOLS - SHOUT OUT		
Rule	Ranger Shouts	Student Shout Reply
Walk on Bare Rocks	<i>Walk on</i>	BARE ROCK
Don't pick up alive critters	<i>Alive or attached</i>	DON'T PICK IT UP
OK to touch gently	<i>Touch</i>	GENTLY
No Collecting	<i>Collect only</i>	TRASH
Leave sticks and stones	<i>Sticks and Stones</i>	LEAVE EM ALONE

Upon completion of the “Good ranger - Bad ranger” skit, students and chaperones will break up into small designated groups and proceed with their assigned ranger.

Zone Painting (*Chaperone-led Groups - On the Cobble Beach stairs*)

Materials (enough for 5 sets or up to 20 students): Student activity booklets, watercolor pencils, sharpeners, water, cups and clipboards.

Looking from the Cobble Beach stairs or over-look, help students to see the zonation patterns on Seal Rock (*the largest island furthest from shore*). Identify and review the different zones.

1. Divide students among chaperones. Have your chaperones help distribute student activity booklets, clipboards, and watercolor pencils.
2. Model instructions for students to delineate and paint the three distinct zones on Seal Rock. Give 5 minutes to paint in small, chaperone-directed groups. Introduce the “magic” (water) and encourage kids to create a watercolor masterpiece.
3. Collect painting supplies and pass out “Find Me a Zone” scavenger hunt cards and dry-erase markers.



Find Me a Zone Scavenger Hunt (*Instructions on stairs, then proceed to the tide pools*)

Materials: “Find Me a Zone” scavenger hunt and dry erase markers.

1. Introduce the activity by having chaperones hold up their scavenger hunt card so all students can clearly see it. Request a student to read one description from the card. Ask students to guess which zone the described animal might be found.
2. Using the following statement, introduce and discuss the term “hypothesis;” *What is the scientific name for guessing?* Ask students to hypothesize in which tide pool zone the described animal would be found. Ask students to indicate this on the scavenger hunt card by placing a “H” (*high tide zone*), a “M” (*middle tide zone*), or a “TP” (*tide pool zone*).
3. Repeat steps 1 and 2 for a second animal, then instruct chaperones to work in small groups continuing as described above in steps 1 and 2, until students have hypothesized for each species on the scavenger hunt card.
4. Proceeding to the designated tide pool area, quickly review tide pool rules (shout out), then clarify scavenger hunt instructions. Assign a time and an indicator (such as a whistle) on when and how to regroup.
5. Chaperones lead their designated groups to complete the scavenger hunt while exploring the tide pools. The ranger roves between chaperone-led groups while answering questions, pointing out things of interest, keeping students on track, and monitoring safety and time management.



Re-defining Zonation (Ranger-led Groups)

Materials: "Find Me a Zone" scavenger hunt and dry erase markers.

1. Call the group to the shore and escort students to an appropriate area for this activity. Set up away from distractions, somewhere that offers an easy transition for the inspirational activity. Try to have students sit on rocks (not on the cliffs) with hands free from playing in the sand, shells, etc.
2. Discuss with students their findings from the scavenger hunt: *What was the coolest thing they found? Did you find anything in the tide pool zone? High tide zone? Middle tide zone?*
3. Hand out a laminated invertebrate picture to each student and ask a chaperone to hold up the "Find Me a Zone" poster.
4. Using the "Find Me a Zone" scavenger hunt, query students holding Barney Barnacle (first species on the list). Call them to the poster, and ask them to place "Barney" (attached with Velcro) in the zone(s) where barnacles were found.
5. Repeat step three for each of the other species on the list, then recap zonation using questioning and examples from different species. *Why would barnacles primarily be in a high-tide zone versus a low-tide zone? Can a tide pool critter like a sculpin live in a high tide zone? Why or why not? Etc.*
6. To wrap up the activity, ask students whether or not their hypotheses were correct or not.

Reflection

The program concludes with a reflective activity. Because so many different groups respond to different types of activities uniquely, your group's ranger may choose to play a game, do a quiet, solo activity, or use a talking-stick to discuss the day's events from a thoughtful and meaningful point of view, allowing the students to connect with rocky shore ecology on a deeper level. A couple of possibilities are:

- Tide Pool Watch – Individual or small groups of students will be assigned to a specific pool where they spend up to 5 minutes in silence to observe.
- Sounds – As a group, students will silently listen to, and count, the different natural sounds.
- Magic Spot – Students will be assigned an individual spot along the shore and given silent time to observe and reflect.



After allowing time for the reflective activities, students will regroup for a short sharing of their personal experience during the activity or the program.

Note: The above outline contains step by step instructions used by rangers during the presentation at Yaquina Head, in order to give participating teachers an understanding of what to expect during the scheduled field trip. These activities may also be used by the teacher to implement the same program in another site, or as a Teacher-led program at Yaquina Head if ranger-led programs are unavailable.