SeaCrets of Tide Pools

4th– 5th grade
Intertidal Species and Zonation Program

Yaquina Head Outstanding Natural Area
750 Lighthouse Drive, Newport, OR 97365
Telephone: (541) 574–3122 or 574-3100
Email: *roy_simpson@blm.gov*

SeaCrets of Tide Pools

Objectives:

- Identify at least 10 tide pool organisms and their associated "habitat/zone."
- Define and discuss zonation
- Recall and discuss tide pool rules and discuss their importance
- Create and test a hypothesis: In which zone will specific invertebrates be found?
- Create an artistic representation of tide 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 tide pool ecosystem.

Pre-Visit Activities:

- Identify and/or review tide pool organisms
- Define and discuss species "Zonation".
- Pre-visit Assessment: *Find Me a Zone* (Read and hypothesize)
- KWL Chart
- Review tide pool rules using "Shout Out."

On-Site Activities:

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

Post-Visit Activities:

- Post-visit Assessment: *Find Me a Zone* (Compare with pre-visit assessment)
- Complete the KWL Chart
- *Intertidal Animal Scrable* activity or variation.
- Summarize a field trip experience, 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 clean-up, or educate another class by presenting an EE-related activity, poster, etc.

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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

THE SEACRET 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 become tide pool detectives; completing a scavenger hunt by finding and observing species within each zone. Returning to the shore, rangers will lead a lively review of student results, before introducing a reflective activity that allows students personal time to reflect in nature. In conclusion, 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 proceed as directed (at the entrance station or else pre-arranged) to the staging area. A ranger will board the bus and welcome your group, and give further instructions about how to safely embark and 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. To add spice and content, another ranger will "Zone Out" while dramatically introducing the concept of zonation. The entire skit will conclude with a spirited "shout out," review of the rules.

Shout Out – Rules of the Pools

Rule	Ranger Shouts	Student Shout Reply
Walk on Bare Rocks	*Walk on*	**BARE ROCK**
Don't pick up alive critters	*If it is alive or attached*	**LEAVE IT BE**
OK to touch gently	*Touch*	**GENTLY**
No Collecting	*Collect only*	**TRASH**
Leave sticks and stones	*Sticks and Stones*	**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 twenty students): Copies of Seal Rock drawing sheets, 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, 2-5 students per drawing (up to five groups). Hand out to each chaperone-group a "Seal Rock" handout, watercolor pencils, sharpeners, water, cups and clipboard.
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. Have students write individual names on their group-sheet.
3. Collect painting supplies and pass out "Find Me a Zone" scavenger hunt cards, and dry-erase markers.
4. Show and tell about student zone paintings.

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

Materials: "Find Me a Zone" scavenger hunt cards 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 cards 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, to be decided upon by the ranger. Because so many different groups respond to different types of activities uniquely, your group's ranger may chose to play a game, do a quiet, solo activity, or use a talking-stick to discuss the days 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.

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Student Activity Book

TIDEPOOL REFLECTIONS

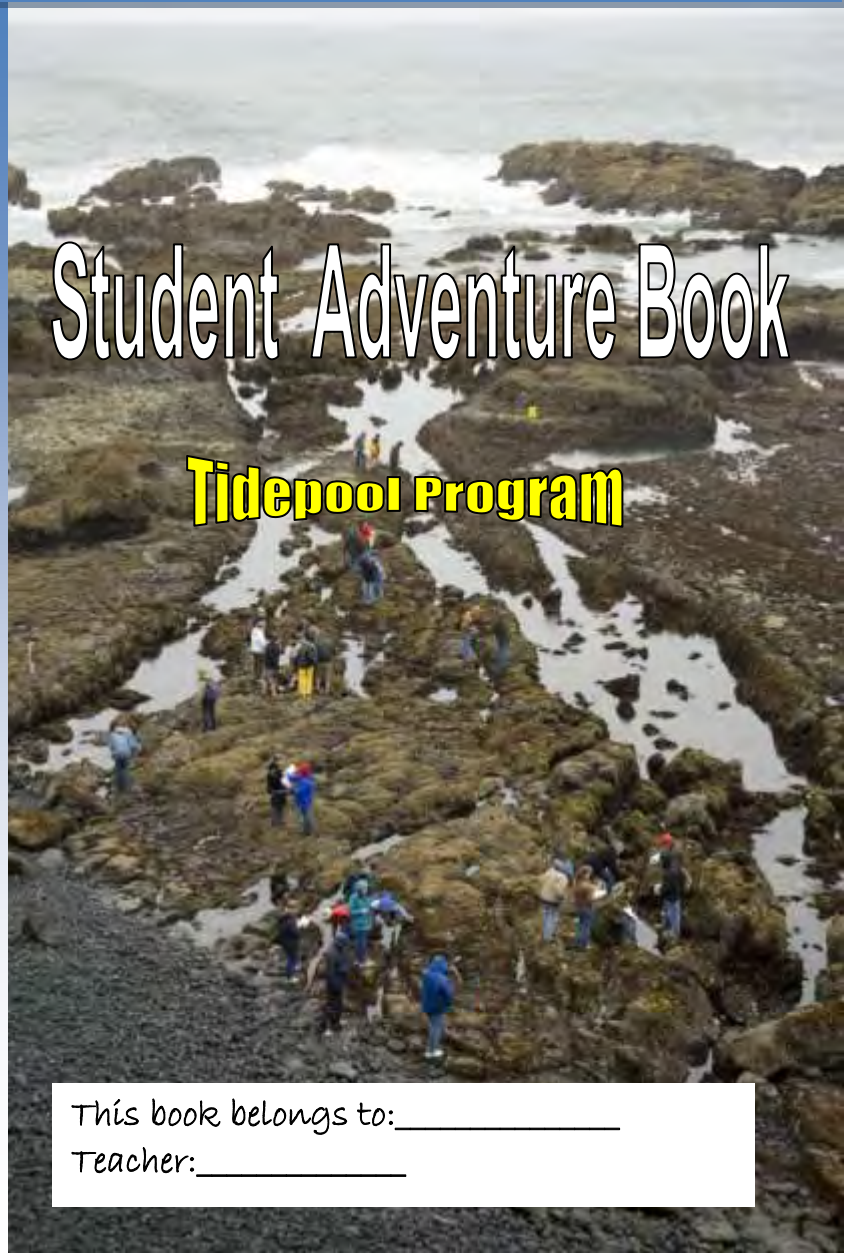
Writing - Poetry - Artwork

Look around and find a place where you can be alone and observe a tidepool or other natural setting. Describe something you observe or experience.

RULES OF THE POOLS - SHOUT OUT

	Ranger Shouts	Student Shout Reply
Walk on Bare Rocks	*Walk on*	**BARE ROCK**
Don't pick up alive critters	*Alive or attached*	**DON'T PICK IT UP**
OK to touch gently	*Touch*	**GENTLY**
No Collecting	*Collect only*	**TRASH**
Leave sticks and stones	*Sticks and Stones*	**LEAVE EM ALONE**

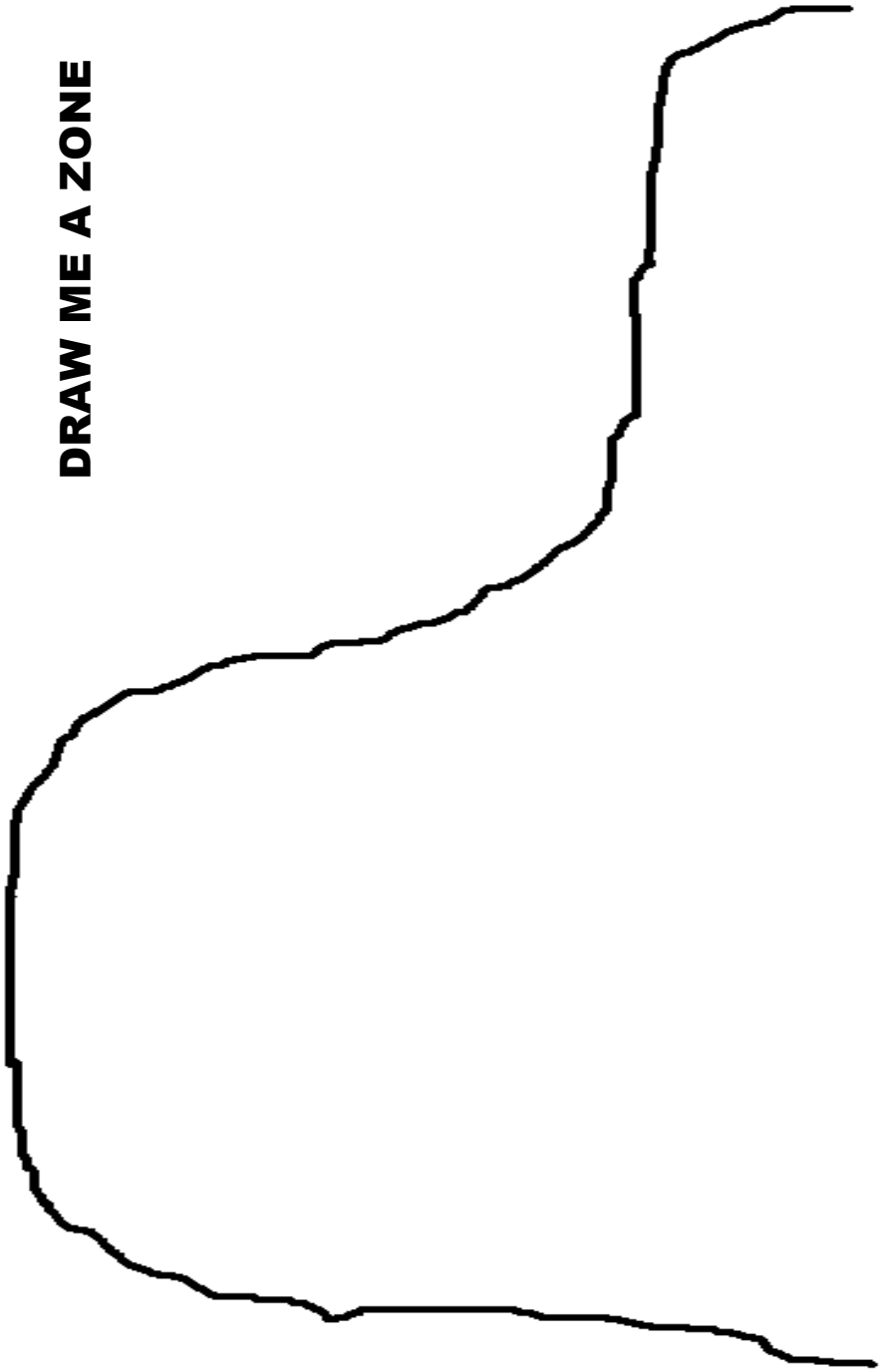
Yaquina Head Outstanding Natural Area



This book belongs to:_____

Teacher:_____

DRAW ME A ZONE



FIND ME A ZONE!

Barney Barnacle

I don't mind the sun and can stick around for days without salt water.

High Tide Zone Middle Tide Zone Low Tide Zone Tidepool Zone

Tommy Turban Snail

I can live in and out of the water because my black shell protects me.

High Tide Zone Middle Tide Zone Low Tide Zone Tidepool Zone

Andy Anemone

I look like a big green flower, but I am a tidepool animal.

High Tide Zone Middle Tide Zone Low Tide Zone Tidepool Zone

Ursula Urchin

I really love to be in the pools, burrowed in the rock.

High Tide Zone Middle Tide Zone Low Tide Zone Tidepool Zone

Martha Mussel

I live in "beds" on the top of rocks and hold on to the rocks with my byssus threads.

High Tide Zone Middle Tide Zone Low Tide Zone Tidepool Zone

Harold Hermit Crab

I like to steal the shells of snails so that I can protect myself from the sun. My favorite thing to do is eat dead things in the water.

High Tide Zone Middle Tide Zone Low Tide Zone Tidepool Zone

Sally Sea Star

With my five legs and hundreds of tube feet, I am the Queen of the Tidepools!

High Tide Zone Middle Tide Zone Low Tide Zone Tidepool Zone

Stevie Sculpin

I can't breathe or swim unless I am underwater. You need to be very still to see me.

High Tide Zone Middle Tide Zone Low Tide Zone Tidepool Zone

Sheldon Shore Crab

When the tide is out, I like to scurry sideways under rocks to protect myself from the sun.

High Tide Zone Middle Tide Zone Low Tide Zone Tidepool Zone