

Life Under Rocks

Grade Level: First

Developers: Peggy Madron, Lisa Hollenbeck, Callie Hart (teachers), Stephanie Schroeder (fellow)

Learning Goals:

After completing this unit students will be able to:

- name a number of tide pool plants and animals
- describe and draw the habitat in which tide pool animals live
- describe and mimic how various tide pool animals move
- describe and mimic how various tide pool animals eat

Oregon State Science Standards addressed:

Content Standard for Science as Inquiry: Fundamental abilities necessary to do scientific inquiry, Grades K-4

*Ask a question about objects, organisms, and events in the environment.

*Plan and conduct a simple investigation.

*Employ simple equipment and tools to gather data and extend the senses.

*Use data to construct a reasonable explanation.

*Communicate investigations and explanations.

Material list for the unit:

- Tide pool field trip booklet for each student
- Pencil for each student
- Question guide for each adult helper
- Field guides

Time needed for the unit:

Rocky shore lessons should be started about 4 weeks prior to the field trip.

Time needed for the field trip:

To allow plenty of time for exploration, it is good to be at the tide pools for 1 ½ to 2 hours. Each of the tide pool inquiries takes about 15 minutes (45 for all three). You also need to incorporate drive time, lunch, walking down the trail, and bathroom breaks.

Best locations for the field trip.

The best location is Cape Arago's South Cove. If this is not possible, Sunset Beach and Bastendorf Beach's south end have tidepools (but not as good).

Summary of Unit

Pre-activities for the unit are the first grade MARE Rocky Seashore curriculum and GK12 companion lessons. These lessons familiarize students with tide pool

plants and animals, animal behavior, and the habitat. Before the field trip, the teacher leads the students in developing hypotheses of which animals live under large vs. small rocks, and why; which live under rocks in the mid-tide zone vs. the low-tide zone and why; and how many different types of seaweed they will find.

The tide pool inquiry unit has three lessons (or stations):

Lesson one is a comparison of what lives under large versus small rocks within the same tide zone.

Lesson two is a comparison of what lives under a large rock in mid tide zone versus what lives under a large rock in the low tide zone.

Lesson three is an investigation of how many types of seaweed are found.

There will be time during the field trip for exploration guided by open-ended inquiry-based questions.

Post-activities include creating Venn diagrams, graphs, pictures, writing, and conversation about the data collected on the field trip.

Lesson One -- Large versus small rock-flipping experiment.

Problem: Which tide pool animals live under large rocks and which tide pool animals live under small rocks?

Hypotheses: (student generated, may include) Hermit crabs like to live under small rocks, because they already have shells for protection. Sea stars live under large rocks because they are big and need a big rock to hold on to.

Procedure: Find a small and large rock (rock should be on a solid surface and not sunk in sand or muck). Large rocks are two adult hands (fingers together) or bigger, small rocks are smaller than two adult hands. Adult should do the flipping, one rock at a time. Observe and note which animals live under the rocks. Parent leaders ask questions from the question guide to get students thinking about the animals. Follow all etiquette rules and gently flip rock back over. Do this again for the other size rock. Repeat the procedure for about 3 or 4 of each size rock.

Conclusion:

Compile data back at the classroom using graphs, Venn diagrams, and whole class discussion. Discuss the results and how they compare to the students' pre-field trip thoughts.

Lesson Two -- Low-tide zone versus mid-tide zone rock-flipping experiment

Problem: What tide pool animals live in the mid-tide zone and what tide pool animals live in the low-tide zone?

Hypotheses: (student generated, may include) Hermit crabs like to live in the mid-tide zone because they aren't good swimmers. Sea stars live in the low-tide zone because there is more to eat.

Procedure: Find a large rock in the mid-tide zone (rock should be on a solid surface and not sunk in sand or muck). Large rocks are two adult hands (fingers together, this is about 4 kids hands). Adult should do the flipping, one rock at a time. Observe and note which animals live beneath the rocks. Parent leader asks questions from the question guide to get students thinking about the animals. Follow all etiquette rules and gently flip rock back over. Repeat on 2 to 3 rocks in mid-tide zone. Do this again for 3 to 4 rocks in the low-tide zone.

Conclusion: Compile data back at the classroom using graphs, Venn diagrams, and whole class discussion. Discuss the results and how they compare to the students' pre-field trip thoughts

Lesson Three -- Seaweed Experiment

Problem: How many types of seaweed can be found at South Cove?

Hypotheses: (student generated, may include) three, eighteen, two million

Procedure: Collect seaweed of different varieties and lay on the beach. Eliminate multiples and use list of inquiry questions to guide discussion. Count. Group leaders (and/or students) record number, colors, textures, sizes, etc.

Conclusion: Compile data back at the classroom using graphs, Venn diagrams, and whole class discussion.

How does the unit address active inquiry learning?

Students are led through the steps of an inquiry investigation. Before the field trip, the teacher initiates questions and the students as a class form different hypotheses. On the field trip, students (with the help of parent leaders) collect data. Back in class they compile results, come up with conclusions, and compare these conclusions with their original hypotheses.

What is the work sample the students will produce?

- Students record data in a tide pool field trip booklet.
- In-class graphs and diagrams.
- Teachers can have students draw and label a tide pool animal.
- Teachers can conduct student interviews.

How can the unit be integrated into the existing curriculum and into other disciplines?

Math: Graphing and Venn Diagrams

Literacy/Communication: Writing and speaking

Art: Acting out animal behavior, drawing

Geography: Mapping tidal zones