

Seaweed Identification in Intertidal Zones

Grade Level: 4th Grade

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Learning goals:

After completing this unit students will be able to:

- identify common species of rocky intertidal seaweeds
- describe the relationship between characteristics of specific intertidal zones and the seaweeds that live there
- describe adaptations that help seaweeds survive in specific intertidal zones

Oregon State Science Standards addressed:

SC.05.LS.01 Group or classify organisms based on a variety of characteristics.; *Classify a variety of living things into groups using various characteristics.*
SC.05.LS.03(.01) Describe basic plant and animal structures and their functions. *Associate specific structures with their functions in the survival of the organism.*
SC.05.LS.05(.05); Describe the relationship between characteristics of specific habitats and the organisms that live there.
SC.05.LS.06; Describe how adaptations help a species survive.
SC.05.SI.03 collect, organize, and summarize data from investigations.

Materials list for the unit:

For class

- Digital or disposable camera (if possible)

For each group of five

- Quadrat - .5m x .5m w/ 8 wires (4 each direction) to make subdivisions of 10cm x 10cm
- Clipboard
- Paper templates of quadrats for recording data (at least 3, one for each tidal zone)
- Permanent markers
- Intertidal seaweed ID guide (laminated)

For each student

- Necklace with lifelong seaweed sighting checklist attached
- Pencil

Time needed for unit: 6-9 lessons for full introduction and follow-up

Time needed for field trip: day-long field trip

Best location(s) for the field trip: South Cove

Summary of the Unit:

This lesson is designed as a culminating activity for the MARE/GK12 unit on kelp forests. It is difficult to take students underwater to a kelp forest. However, kelp forests contain a diversity of species of algae, or seaweed, which exhibit many different adaptations. Examining algal species in the intertidal will help the student gain an appreciation for kelps and other algae in the kelp forest. It is also possible, at times, to see torn up kelp in the intertidal.

Pre-Field Activities:

- Website with videos for intertidal, including impact on intertidal by field trips: http://www.pbs.org/americanfieldguide//teachers/oceans/oceans_unit.html#
Look at the video “Northwest Beach - Tide Pools” (pictorial depiction of intertidal zones- both plants and animals)
Look at the video “Oregon Tide Pools” to model respect for habitat and the damage humans can cause.

- GK12 and MARE Kelp lessons
- Introduction to diversity of seaweeds and their many adaptations
- Introduction to the field trip
 - Review the inquiry process and introduce the science work sample format
 - Discuss the question the class will try to answer in the field - **What happens to seaweed as you move from the low intertidal zone to the high intertidal zone?**
 - Alternatively, each student can come up with their own question to investigate on the field trip (with the given materials)
- Make checklist necklace (one for each student)

Field activities:

- When not collecting data for inquiry project, students observe seaweed and document findings on lifetime seaweed sighting list.
- Students use quadrats placed in each tidal zone to collect seaweed species data. Photograph unidentifiable seaweeds for later identification. The question can be the same for the whole class - **What happens to seaweed as you move from the low intertidal zone to the high intertidal zone?** Or, each student can collect data to answer their own question.
- Using the quadrat:
 - Place quadrat in each intertidal zone (low, mid, and high). Count and record the number of each seaweed to later identify the two most abundant species of seaweed found in each intertidal zone.

- Use paper template of quadrat to record the most predominant color (red, brown, green) of seaweed found in each 10cm square. Label squares which are mostly rock grey.
- Record observations! Essential Questions to ask:
 - What do you notice about the height of seaweed in different tidal zones? Why?
 - Does blade structure change between the tidal zones?
 - Are there different prominent colors of seaweed in different tidal zones?

Post-field activities:

- Complete science work sample (based on individual question, or class question):
 - Analyze data collected in the field and determine the two most prevalent species of seaweed in each of the intertidal zones
 - Pull together class data
 - Graph data from each tidal zone
 - Based on characteristics of common seaweeds found, conclude why those particular species are prevalent in that tidal zone
 - Write a justifying paragraph explaining conclusions
- Students design their own seaweed and describe its characteristics and in what tidal zone it might live

How does the unit address active inquiry learning?

Students take content they have learned about seaweeds, along with scientific procedures they have learned, and sampling tools available (i.e. quadrat sampling), to form a question they have about seaweeds that they can answer using these sampling methods. Students who require more scaffolding complete inquiry work samples using a question developed as a group in the classroom, i.e. **What happens to seaweed as you move from the low intertidal zone to the high intertidal zone?**

What is the work sample that students will produce?

- A data sheet for each tidal zone depicting their sample
- Graphs supporting their conclusions
- A completed scientific inquiry per state guidelines

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

Math: graphing

Literacy: writing

Geography: mapping

Art: drawing and other art extensions

P.E.: nature walk