

Mudflat Field Inquiry

Grade Level: Third Grade

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Learning goals: The students will:

- Learn about mudflats
- Learn mudflat vocabulary
- Learn proper care of a mudflat habitat and it's surrounding environment
- Ask and explore at least one inquiry question
- Complete a science inquiry work sample
- Identify the best place in a mudflat to dig for clams

Oregon State Science Standards addressed:

See tables 2-2 and 2-3 of *Teaching and Learning to Standards Science (7/26/05)*
All are addressed

Materials list for the field trip and post-lessons:

For the class

- tide table
- one-hundred foot measuring tape

For each pair of students

- trowel
- containers for holding organisms (e.g. small buckets, food storage containers)
- quadrat (make own, e.g. strips of laminated tag board)

For each student

- field journal made of rain proof paper
- pencil
- worksheets (vocabulary worksheets, tidal map, inquiry result worksheets and summary worksheet)
- science work sample forms

Time needed for unit:

This unit is designed to complement an extensive wetlands study. The unit as a whole is best with about ten, forty-minutes lessons.

Time needed for field trip: two to three hours

Best location(s) for the field trip:

Charleston Mudflats

Pony Slough

South Slough Estuary

Summary of the unit:

Pre-lessons:

- K.W.L Chart on knowledge of Mudflats; identify questions to investigate on the field trip; introduce the class question: *Where is the best place to dig for clams?*; bring in bucket of mud with organisms
- Introduce “Mudflats” with a slide show/pictures, cover water movement, high/low areas
- Introduce animals living in the mudflats; different types of clams (bivalves), worms, seaweed, crustaceans, etc.
- Introduce science work sample; form scientific question to answer on the field trip
- Discuss tidal zone map; explain the use of quadrats; make own tag board quadrats; go over mud flat digging techniques and rules for field trip
- Practice using quadrats on the school field; chart observations within the quadrat; practice charting observations
- Read fiction and non-fiction books related to wetlands and estuaries

Literature Resource List:

Non-fiction

- *Crabs and Crustaceans (Looking at Minibeasts)* by Sally Morgan
- *Lobsters, Crabs & Other Crustaceans (Animal Classification)* by Daniel Gilpin
- *It Could Still be a Worm* by Allan Fowler
- *Nematodes, Leeches & Other Worms (Animal Classification)* by Steve Parker
- *Earthworms, Leeches & Sea Worms: Annelids* by Beth Blaxland

Fiction

- *Crab Moon* by Ruth Horowitz
- *In One Tidepool* by Anthony D. Fredericks

Mud Flat Field Trip:

- Allow time for exploration
- Lay out transect
 - Divide students into pairs and give each pair a number.
 - Lay out transect line (tape measure); mark off low, mid and high tidal zones; quadrat sampling will be spaced evenly along this line

in the 3 zones (as illustrated on tidal zone map). Attach numbers on tape to indicate where student pairs are to sample.

- Sample quadrats:
 - Draw a picture of quadrat in field journal BEFORE digging. Include plants, holes, bits of sticks, and anything else you think might be important
 - Count burrows and record data in field journal
 - Dig carefully through the mud, collect animals and place in containers with water
 - Count clams, worms, and other organisms, and record data in field journal
 - Return animals and replace sediment
- More exploration, observations and data collection

Post-lessons:

- Discuss observations and questions generated by student explorations
- Compile and graph sampling information: each pair shares data with the rest of the class, then works with other pairs in their tidal zone to analyze data
- Using their own and the class data, students complete their science work samples
- Write a poem or short story inspired by their estuary experience
- Various art projects (e.g. wetland picture, clam diagram, wetland collage, etc.)
- Assessment

How does the unit address active inquiry learning?

A pre-teaching discussion using a KWL chart elicits questions to be explored on the field trip. During the field trip students dig and explore in the mud, discovering “things” which will prompt more inquiry questions. Each student formulates their own questions resulting from their exploration. The class follows a sampling procedure to collect data. Each student completes a science work sample.

What is the work sample that students will produce?

Each student produces a science inquiry work sample with question, hypothesis, procedure, data collection, and conclusion. Other products include vocabulary worksheets, data analysis sheets, drawings, stories and poetry.

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

Literacy: Poetry; writing stories, reading fiction and non-fiction.

Math: Counting, tallying, graphing, and writing mathematical expressions.

Geography: Mapping skills

Art: Drawing

P.E.: Nature walk.