



7TH GRADE | SCIENCE, SOCIAL STUDIES, & ART

# Paper Mâché Tidal Marsh

## Essential understandings

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|---|---|
| <input checked="" type="checkbox"/> Since time immemorial<br><input type="checkbox"/> Tribal government<br><input type="checkbox"/> Language<br><input type="checkbox"/> Sovereignty<br><input checked="" type="checkbox"/> History | <input checked="" type="checkbox"/> Identity<br><input checked="" type="checkbox"/> Lifeways<br><input type="checkbox"/> Treaties with the United States<br><input type="checkbox"/> Genocide, federal policy, and laws |
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## Learning outcomes

By the end of this lesson, students will be able to:

- Students will be able to demonstrate their understanding of a tidal marsh ecosystem by creating a 3D paper mâché model that includes plants and animals,
- Students will be able to orally explain how each species has adapted to the unique habitat
- Students will be able to orally explain how the Coquille Indian Tribal people enrich their people with Tidal Marsh lands.

## Essential questions

How does the Coquille Indian tribe use a Tidal Marsh to enrich their lifeways?

## Logistics

- Where does the activity take place? *Classroom*
- How are the students organized?  
☐ Whole class    ☒ Teams: 3-4    ☒ Pairs    ☐ Individually

## Time required

4-5 60 minute class periods

## Oregon standards

Students who demonstrate understanding can:

- NGSS (Next Generation Science Standards): MS-LS2-1 - Analyze and interpret data to provide evidence for the effects of resource availability on organisms and populations in an ecosystem.
- CCSS (Common Core State Standards): CCSS.ELA-



LITERACY.SL.7.4 - Present claims and findings, emphasizing salient points in a focused, coherent manner with pertinent descriptions, facts, details, and examples.

- Oregon Arts Standards 7th VA.1.CR1.7 –
  - 1. Use a variety of strategies to formulate an idea bank of current interests and concerns that could be explored through artistic inquiry.
  - 2. Use creative methods such as envisioning, intuition, play, modeling, and improvisation to discover the technical characteristics and expressive possibilities of various media.
  - 3. Persist through and learn from challenging artistic investigations throughout the art-making process to develop technical skills.

## **Materials**

- Cardboard base (cut to desired size)
- Masking tape (at least one roll per 4 students)
- Newspaper strips (torn into thin pieces, students can help prep)
- Flour and water paste (1 part flour to 1.5 parts water) or school glue and water paste (1 part glue to 2 parts water)
- Large bowls, at least one per 4 students
- Hot Glue Gun and Hot Glue Sticks (optional)
- Acrylic Paint in Red, Blue, Yellow, White and Black
- Brushes, medium and large sized
- Table coverings, or tarps to lay on floor or outside
- Colored paper (various colors)
- Scissors
- Modeling clay (optional)
- Pipe cleaners (optional)
- Buttons, googly eyes, wooden shapes, beads, or other sculptural materials (optional)
- Recycled materials like clean paper towel or TP tubes, cardboard boxes, etc. (optional)

## Vocabulary

- Coquille Indian Tribe: A federally recognized group of indigenous people who have lived on the southern Oregon Coast since time immemorial.
- Tidal marsh: A coastal wetland that experiences regular flooding from tides.
- Ecosystem: A community of living organisms interacting with each other and their nonliving environment.
- Adaptation: A change in an organism that helps it survive and reproduce in its environment.
- Salinity: The amount of salt dissolved in water.
- Producer: An organism that makes its own food, like plants.
- Consumer: An organism that eats other organisms for food.
- Decomposer: An organism that breaks down dead organisms and returns nutrients to the soil.
- Invertebrates: Animals without backbones, like crabs, worms, and insects.
- Camouflage: Using coloration or patterning to blend into the surroundings.
- Wading bird: A long-legged bird that feeds in shallow water.

## Extension Activities

- For students who finish early, they can research and present on a specific plant or animal found in a tidal marsh ecosystem that was not included in their model.

## Overview

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- **Components of a Tidal Marsh Ecosystem:** Students will explore the unique characteristics of a tidal marsh, including the constant change in water levels due to tides, the presence of plants and animals specially adapted to this environment, and the delicate balance within the ecosystem.
- **Understand how the Tidal Marshes enrich the Coquille Indian Tribes lives:** Students will explore the different ways the Coquille Indian Tribal people could use tidal marshes to benefit their lives and sense of identity.
- **Adaptation Analysis:** Students will focus on the adaptations of various plants and animals in the tidal marsh. This analysis will involve identifying the challenges of the habitat (like salinity, changing water levels) and how different species have evolved specific traits to survive and thrive.

- **Scientific Communication:** By creating a 3D model and presenting their chosen organisms, students will effectively communicate their understanding of adaptations. They will explain how each plant or animal's unique features allow it to flourish in the tidal marsh environment.

This lesson plan provides a multi-faceted approach to learning. Students will not only gain knowledge but will also practice creative thinking, model building, and scientific communication through their presentations.

## Background for teachers

This lesson expands on the wonders of tidal marshes by introducing students to the concept of landscape change. Here's a quick rundown for teachers:

- **The Coquille Estuary:** We'll shift focus to a specific estuary, the Coquille, as a real-world example. Here, students will explore how natural and human influences have altered the landscape.
- **Vocabulary in Action:** Key terms like "estuary," "wildlife refuge," and "adaptation" will be reinforced as students investigate the Coquille's unique ecosystem.
- **Human Impact:** We'll delve into human activities like fish weirs and their impact on the estuary's hydrology, which is the study of water movement in relation to land. This will spark discussions about responsible interaction with the environment.
- **Connecting the Dots:** By analyzing landscape changes, students will see how they can affect the delicate balance of the tidal marsh ecosystem explored in the first lesson.

Here is information on the Coquille Indian Tribe:

Teachers should visit the Coquille Indian Tribe's website (<https://www.coquilletribe.org/>) and become familiar with Tribe's history. The Tribe's ancestral homelands extend to all reaches of the Coquille River watershed and surrounding areas in Coos, Curry, and Douglas counties.

The Coquille Indian Tribe's history, culture, and lifeways are inseparable from the forests, meadows, and coastal lands of Southwest Oregon. This region's fertile landscape provides plentiful resources for the Tribe, including abundant forests and a rich coastal ecosystem. Prior to contact with non-Indians, the Tribe constructed its permanent villages along the tidewaters and lower reaches of streams and rivers. At least seven of these villages are known to have been around the southern Oregon Coast.

Both historically and in the present day, the Tribe has relied on the forests, meadows, tidal pools, estuaries, and ocean for food, medicine, and shelter. From the ocean they harvested mussels, clams, and other shellfish. From the rivers they harvested salmon, sturgeon, lamprey, and other fish. From the forests and meadows, they gathered roots, berries, and medicinal plants such as buckbrush, fireweed, yarrow, and cascara buckthorn, and stinging nettle. Seashells were used as ornaments on clothing, especially the tusk-like shells called dentalium. Many of these traditions persist in the present day.

From time immemorial, sea otters also made their home along the Oregon Coast. The Coquille Indian Tribe used their pelts for clothing—both practical and ceremonial—and for some kinds of shelter. Sea otter pelts were highly valued and were worn as capes by some honored men and as ceremonial headdresses for women. Because of the Coquille Indian Tribe’s understanding of kinship with the animal world, every animal or fish that was harvested was treated reverently and with respect. Every part of the animal was used for either food, clothing, or tools.

The Coquille Indian Tribe continues to be a steward of the land and sea. The Tribe makes careful use of natural resources; protects wildlife habitat; and promotes a lush, diverse, and productive landscape. For example, the Tribe uses fire proactively to encourage fresh growth of useful plants—a practice they have been using for thousands of years. Routine burning manages the growth of brush and helps clear the underlying layer of vegetation in old-growth forests. This also helps maintain grassy prairies on ridges and southwest slopes, where plentiful elk are a cherished blessing. Since the Coquille Indian Tribe’s restoration in 1989, the Tribe has regained several important tracts of its ancestral lands.

### **To prepare for this lesson teachers should**

1. Review key concepts from previous lessons on tidal marshes.
2. Have a good understanding of how the Coquille Indian Tribal people interacted with tidal marshes and how the food and cultural material helps their people.
3. Consider how to introduce landscape change and the Coquille Estuary.
4. Gather art materials based on what is available and affordable.
5. Create a small sample of a 3D paper mâché model of a tidal marsh ecosystem, including at least one animal and one plant you would like to demonstrate for students.
6. Consider the facilitation of student presentations on their models, focusing on adaptations.

7. Consider the space – including coverings for tables, a place to store and dry student models in between classes, and a place and materials for students to clean up after paper mâché and painting.

## References

Coquille Indian Tribe - SB13 - Grade 7 - Lesson 2 - Lesson Plan

## Resources

- National Oceanic and Atmospheric Administration (NOAA) - Estuaries  
[https://oceanservice.noaa.gov/education/tutorial\\_estuaries/welcome.html](https://oceanservice.noaa.gov/education/tutorial_estuaries/welcome.html)
- US Fish and Wildlife Service - Wildlife Refuges  
<https://www.fws.gov/program/national-wildlife-refuge-system>
- The Nature Conservancy - What is a Tidal Marsh?  
<https://www.pewtrusts.org/en/research-and-analysis/articles/2021/03/22/6-types-of-wildlife-and-plants-that-thrive-in-salt-marshes>
- Bandon Marsh National Wildlife Refuge (Wildlife photos)  
<https://www.fws.gov/refuge/bandon-marsh/species>

## Considerations for teachers

### Practices

- *Small/paired groups* – paired in groups of 2 or small groups of 3-4.
- *Classroom discussion* – Teacher will ask questions about how tidal marsh areas could benefit people, specifically the Coquille Indian Tribal people.

### Learning targets

- I can define the terms: tidal marsh, ecosystem, adaptation, salinity, producer, consumer, decomposer, invertebrates, camouflage, and wading bird.
- I can describe the key characteristics of a tidal marsh ecosystem, including the changing water levels and the presence of saltwater.
- I can identify different plants and animals that live in a tidal marsh.
- I can explain how adaptations help plants and animals survive in a tidal marsh ecosystem.

- I can analyze the challenges of the tidal marsh environment and relate them to specific adaptations of plants and animals.
- I can compare and contrast adaptations of different organisms in the tidal marsh.
- I can explain how the food and materials from tidal marshes enrich the Coquille Indian Tribal people.
- I can use the element of form to demonstrate my understanding of tidal marsh characteristics, including plants and animals, with sculptural details.

## Assessment

Students will present their 3D paper mâché models to the class, explaining the adaptations of each plant and animal within the tidal marsh ecosystem.

### Assessment Rubric:

Criteria	4 - Excellent	3 - Proficient	2 - Basic	1 - Below Basic
Demonstration of Understanding	Shows a deep understanding of the tidal marsh ecosystem and effectively explains the adaptations of each plant and animal with thorough detail.	Demonstrates a good understanding of the tidal marsh ecosystem and can explain most adaptations of plants and animals with clarity.	Shows a basic understanding of the tidal marsh ecosystem but struggles to explain some adaptations of plants and animals.	Shows minimal understanding of the tidal marsh ecosystem and struggles to explain adaptations of plants and animals.
Model Creativity	Displays exceptional creativity in the design and construction of the 3D paper mache model, capturing the essence of the ecosystem with many sculptural details.	Shows creativity in the design and construction of the 3D paper mache model, effectively representing the ecosystem with sufficient sculptural details.	Exhibits some creativity in the design of the 3D paper mache model, but it lacks representation of the ecosystem and has few sculptural details.	Shows little to no creativity in the design of the 3D paper mache model, does not represent the ecosystem.
Oral Presentation Skills	Presents claims and findings confidently, highlighting salient points with clear and engaging	Presents claims and findings coherently, emphasizing key points with relevant	Attempts to present claims and findings but may lack coherence and clarity in	Difficulty in presenting claims and findings, lacks coherence, and struggles to provide

	descriptions, facts, and examples. Shares many examples of how the tidal marshes add benefit to the lives of the Coquille Indian Tribal People.	descriptions, facts, and examples. Shares some examples of how the tidal marshes add benefit to the lives of the Coquille Indian Tribal People.	explanations. Shares few examples of how the tidal marshes add benefit to the lives of the Coquille Indian Tribal People.	relevant explanations. Shares 0-1 examples of how the tidal marshes add benefit to the lives of the Coquille Indian Tribal People.
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## Appendix

Materials included in the electronic folder that support this lesson are:

- Coquille Indian Tribe- SB13- Grade 7- Lesson 2- Lesson Plan





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## Activity 1.

### Title Marsh Project | 3-4 60 minutes class periods

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#### Overview.

#### Day 1: Introduction to Tidal Marshes

1. **Do Now (5 minutes):** Begin with a brainstorming activity. Ask students, "What kind of animals do you think live in a tidal marsh or coastal ecosystem?" List their answers on the board.

*Teacher Says: "Today, we'll be exploring a fascinating ecosystem called a tidal marsh. It's a special place where land and water meet, and the water level changes with the tides. These areas provide a rich environment and has been used for collecting food and cultural material since time immemorial."*

2. **Presentation and Discussion (15 minutes):**

- Show [pictures or diagrams](#) of a tidal marsh environment.
- Briefly explain the key features of a tidal marsh, including the constant change in water levels, the presence of saltwater, and the unique plants and animals that live there.

*Teacher Says: "Tidal marshes are like busy neighborhoods for all sorts of creatures. But it's a challenging place to live! The water level keeps changing, and the water is salty. How do you think plants and animals survive in this environment?"*

*"These tidal marshes are also very important to the Coquille Indian Tribe. The Coquille people have lived in the Coquille Valley since time immemorial, and the tidal marshes have always been a vital part of their culture and way of life. The marshes provide the Coquille people with food, medicine, and materials for making tools and shelter."*

*"Tidal marshes are teeming with life, but they also pose challenges for survival. The Coquille Indian Tribe, who have lived in the area since time immemorial, understand this well and have relied on the marshes for their way of life."*

*“What kind of items for the tidal marshes would be used to benefit the Coquille Indian Tribal people? Think of foods, material for making baskets, items that could be used to create tools.”*

**3. Adaptation Exploration (15 minutes):**

- *Introduce the concept of adaptation and how it helps organisms survive in specific environments.*
- *Show pictures of [various tidal marsh plants and animals](#) (cordgrass, fiddler crabs, oysters, etc.). Discuss how each organism might be adapted to the challenges of the marsh (e.g., cordgrass with salt-filtering roots, fiddler crabs with breathing above water, oysters with strong shells).*

*Teacher Says: "Just like how we wear winter coats to stay warm, plants and animals have special features to help them survive in their environment. These features are called adaptations. Let's see how different creatures in the tidal marsh have adapted to this special place."*

**4. Activity Introduction (5 minutes):**

- *Briefly introduce the project: creating a 3D paper mâché model of a tidal marsh scene. Students will include various plants and animals and be prepared to explain the adaptations of their chosen organisms during a presentation.*

*Teacher Says: "Now, it's your turn to become tidal marsh experts! You'll be creating a 3D model of this ecosystem, showing different plants and animals that live there. Remember to think about their adaptations as you design your model."*

**Day 2: Building the Marsh**

1. **Review (5 minutes):** *Briefly review the key points from Day 1: tidal marsh characteristics, adaptations, and project expectations.*
2. **Model Building (60-75 minutes):**
  - *Provide students with the paper mâché materials, colored cardstock paper, scissors, and other craft supplies.*
  - *Demonstrate how cardboard forms (tubes, cardboard taped into shapes with masking tape) can serve as a structure for various plant and animal forms.*

- *Demonstrate how to use paper mâché paste- make sure students pull off any excess paste from the newspaper strips with their fingers before attaching, to avoid a soggy model.*
- *Students can start building the base of their model on the cardboard using torn newspaper strips and paste.*
- *Encourage them to use their creativity to design their marsh scene, incorporating different plant and animal life. Encourage students to experiment and remind them that there are no right or wrong answers in the creative process! Offer guidance on using paper to create plants (stems, leaves, petals) and paper mâché, modeling clay or pipe cleaners for animal shapes (beaks, feathers, shells, fur).*

*Teacher Support: Circulate around the classroom to assist students with techniques, answer questions, and ensure they are incorporating elements that showcase adaptations. If students have sensory issues with the paper mâché process, offer them an alternative such as modeling clay or sculpting with paper, tape, and hot glue if using. If hot glue is used, make sure that students are supervised closely and are aware of the danger of burns if touching the tip or hot glue before it dries.*

### **Day 3: Painting and Details**

- *Ensure student projects have dried before adding paint and details.*
- *Set out paints, water cups, and extra cardboard for mixing. Also have colored paper, scissors, and hot glue available if using.*
- *Encourage them to use their creativity to design their marsh scene, incorporating details such as mixed colors (students can use extra cardboard as a palette for mixing), and textures (students can glue on additional materials such as fabric, buttons, beads, etc.).*
- *Remind students to take their time to cover all of the sculpture and base with color – using paint or colored paper – to demonstrate attention to detail and care with their work. Before students finish, have them check in with you or a peer to see if there is anything else they could add or touch up.*



## **Day 4: Presentations and Wrap-Up**

### **1. Presentations (45-60 minutes):**

- *Students come prepared to present their completed 3D models to the class.*
- *Each student should explain the different plants and animals they included and how their chosen organisms have adapted to the tidal marsh environment.*
- *Encourage classmates to ask questions and share their observations.*

*Teacher Role: Facilitate the presentations, ensuring everyone gets a chance to share. Ask clarifying questions if needed and highlight the diverse adaptations students showcased in their models.*

### **2. Wrap-Up and Assessment (10-15 minutes):**

- *Discuss the importance of tidal marsh ecosystems and the importance to the Coquille Indian Tribal people.*
- *Encourage students to write or verbally share about their experience with the project; what did they learn from the process? What did they learn from their classmates?*
- *Optional: Before teacher assessment, have students fill out a self-assessment using the project rubric.*