MARITIME HIGH SCHOOL
PROJECT DESIGN PLANNER

1. Project Overview

Use this planner in conjunction with the MHS Project Design Rubric to ensure your project design contains the essential elements of a high quality PBL project.

	Focus Area(s)	Quarter	Number of Weeks	Start Date	End Date
Project Focus Area & Timeline	**Marine Resources and Research**	**3**	**8**	**2/6/23**	**3/31/23**

Project Title	**Vessels and Voyages**
Driving Question	"How does water move through the ocean and how does this impact marine pollution?"
Subject	**STEM**
Project Summary	Students will learn about how temperature and salinity affect density, how these can change in the ocean, and what contributes sources of heat and freshwater. They will learn about how this contributes to ocean circulation. Students will also learn about tides and the general structure and oceanography of the Salish Sea, both in preparation for their overnight trip with Salish Sea Expeditions as well as to explore how local oil spills behave.
Public Product(s) (Individual and Team)	Note which products are individual or team and the product/performance's intended audience. Students will use a model to simulate the results of an oil spill, and work in teams of simulated stakeholders to develop a response to the oil spill. As part of this process, students will use knowledge of Puget Sound Oceanography (density, currents, tides) to predict possible pathways for the oil spill and how it will affect local communities and marine organisms. They will identify local stakeholders, their skills/knowledge, and how they can contribute to an oil spill response

	Field Work Experiences	Community Collaborators & Industry Contacts (Some options)
Authentic Connections	**Salish Sea Expeditions sailing trip**	

2. Learning Goals

Use this section to outline the competencies that the project will target (according to the MHS competencies), as well as the content knowledge, skills, and dispositions that align with each of those competencies. There is space for four competencies, but the project may have more or less.

Competencies MHS competencies	Scientific Reasoning - Design & Conduct Empirical Research - Apply disciplinary Science knowledge & theories	Social Reasoning - People, places & environments		
Knowledge & Skills	Temperature and salinity change the density of ocean water Tides are caused by the gravitational pull of the sun and moon Changes in density and winds create currents in the Salish Sea Currents move marine organisms, debris, and pollutants	Environmental disasters (i.e. oil spills) affect both humans and marine organisms and can have disparate effects on different communities		
Dispositions				

Identity[1] How will your teaching help students learn something about themselves and/or others?	Learners will… Reflect on their role as a member of a Salish Sea-adjacent community and how this affects their role as a stakeholder in response to oil spills and other environmental disasters.
Criticality[1] How will you engage your thinking about power, equity, and anti-oppression in the text, in society, and in the world?	Learners will… Understand how demand for fossil fuels leads to oil spills?

Refer to **Maritime Learner Profile** for Maritime Focus Area content, skills & knowledge

RUBRICS	Link/name rubric(s) you intend to use; template for your use

3. Project Milestones

Directions: Use this section to create a high-level overview of your project. Think of this as the broad outline of the story of your project, with the milestones representing the significant **'moments'** or **'stages'** within the story. As you develop these, consider how the inquiry process is unfolding and what learning will take place. The Project Calendar (Section 5) will allow you to build out the milestones in greater detail. You may have more than 6 milestones, in which case make an additional copy of the chart below.

Milestone: an action or event marking a significant change or stage in development

Artifact: an object made by a human being, typically an item of cultural or historical interest.

Milestones, Assessments & Artifacts

Milestone #1 Consider indicating if this is tied to team or individual learning/products	**Milestone #2**	**Milestone #3**	**Milestone #4**	**Milestone #5**	**Milestone #6** Public Product
Develop Unit essential questions	How does the density of water change at different temperatures and salinities?	How does water circulate through the Salish Sea and One Ocean?	What are the causes and effects of the tides?	Who are the stakeholders in an oil spill response and what are their roles?	How can you model an oil spill and plan a response?
Key Student Question	**Key Student Question**	**Key Student Question**	**Key Student Question**	**Key Student Question**	**Key Student Question**
Formative Assessment(s)	**Formative Assessment(s)**	**Formative Assessment(s)**	**Formative Assessment(s)**	**Formative Assessment(s)**	**Summative Assessment(s)**
Students contribute their ideas about unit essential questions	Students complete in class experiments related to density and use their observations to explain graphs of ocean density and circulation				

[1] Muhammad, Gholdy. *Cultivating Genius: An Equity Framework for Culturally and Historically Responsive Literacy*. Scholastic, 2020.

4. Project Calendar

Use this space to connect milestones from above to specific dates, competencies, industry connections, and more details. There is space to plan both in-class and during Field Work Experiences (FWEs), but not all projects will be fully integrated between the two.

Week		Dates	Milestone(s)	Industry Connection (if any)	Students will…	Deliverable(s)	Instructional Objectives (For FWE reporting to district)
1	In-class	2/6 2/7	Essential Questions Density experiments with salt water and ice cubes		Describe the affect of temperature and salinity on density	Observations from experiments	
	FWE	2/8 2/9	CAD#1/Canoe Build 1 Center for Wooden Boats	Intro to CAD	Complete a introductory CAD tutorial in Sketchup	Replica of simple CAD sketch	
2	In-class	2/13 2/14	Density: Ocean Motion Model Density: Global maps and using resources		Model how temperature affects ocean circulation	Use observations to explain plots of ocean density and circulation	
	FWE	2/15 2/16	CAD #2: Turtle Sandbox Canoe Build #2 Storytelling Intensive		Complete an introductory CAD tutorial in Sketchup	Screenshots from completed tutorial	
3	In-class	2/21	Density structure of Puget Sound and intro to tidal currents				
	FWE	2/22 2/23	CAD #3: Make a lego, intro to project, review of making a scale model Canoe Build #3 Storytelling Intensive		Intro final CAD project (to be done with Sketchup and then cut out using Shaper Origin)		
4	In-class	2/27 2/28	Causes and effects of tides Tides and Voyage planning (in collaboration with NWMC)				
	FWE	3/1 3/2	Intro to Shaper Origin		Work on CAD designs for final project Cut out sample item (state from US map)		
5	In-class	3/6 3/7	Finalize causes and effects of tides Introduce Oil spill modeling task				
	FWE	3/8 3/9	Finish Oar CAD designs				
6	In-class	3/13 3/14	½ Crew: Salish Sea Expedition Other ½: Oil Spill modeling				
	FWE	3/15 3/16	Build week in shop for the crew that is on campus				

			Start cutting out oars				
7	In-class	3/20 3/21					
	FWE	3/22 3/23	Canoe Oars				
8	In-class	3/27 3/28	½ Crew: Salish Sea Expedition Other ½: Oil Spill modeling				
	FWE	3/29 3/30	Build week in shop for the crew that is on campus Cut out oars				
9	In-class						
	FWE						

5. Teacher & Student Assessment and Reflections

Before **implementing the project, use this project design rubric to self-assess your project design based on the seven essential components of PBL. If possible, bring in students, educators, and industry professionals during this pre-assessment process to enhance your project. Protocols that can be used during this peer assessment process include:**

I like, I wish, I wonder… | Seven Minute Project Tuning | Project Zero Visible Thinking

During **and** ***after*** **the project implementation, use the space below to record reflections that will help inform the next iteration of the project and ensure we center student voice.**

	Educator Reflections	Maritime Industry Reflections	Student Reflections
Reflections from this project	One thing that worked out really nicely was the overlapping approach to tides between math, science, and maritime, which gave students a multi-faceted understanding of this content in a way that made sense, and also prepared students well for the Salish Sea Expedition and spring AJ work.		
Proposed changes for next year			

6. *Optional*: Lesson Planner (Supporting Resource)

Specific daily lesson planning templates are often teacher-driven and so this template offers an *optional* framework to follow: Maritime High School Lesson Planning Template. Feel free to use it, adapt it or create your own.
Typically, lesson plans include: learning objectives/standards (ie. "I can…" statements), procedure/instructional methods, materials needed, time management, assessments, rubrics and reflection.

I. **CHECKING PRIOR KNOWLEDGE** Identify how you will inventory student knowledge ahead of the task, lesson, or activity. (e.g., previous day's exit tickets, warm-up activity, need to know list review, quiz, class discussion, etc.)

II. **LEARNING OUTCOME** These can be related to success skills or standards. If your district uses a graduate profile or career pathway outcomes, include relevant outcomes here as well.

III. **KEY VOCABULARY** Note which terms or academic vocabulary will be essential to this lesson. If you serve English language learners, consider what additional vocabulary

might be necessary for them to access the content/skills during the instructional activities.

IV. FORMATIVE ASSESSMENT For each lesson, consider which assessment type best measures the learning outcome. For example, a quiz may be the best way to check for understanding of key terms while an annotated sketch might be best for determining student understanding of how the key terms fit together. In some cases, your assessment may be informal, such as an exit ticket, or more formal, as in a rough draft. Finally, when planning your formative assessment, diversify who is doing the assessment. Include self, peer, and teacher assessment opportunities, as appropriate for the age group. When possible, have external partners or end users provide feedback to improve or guide the work.

V. MAJOR INSTRUCTIONAL ACTIVITIES This can include lessons, tasks, activities, or learning experiences. Choose the instructional method that will best help students achieve the learning outcome. For example, a direct instruction lesson may be appropriate for introducing the key players in World War II while an artifact inquiry activity during which students examine primary source documents would be better suited for them to understand the impact of those key players on the pivotal events during the war. This would also be the space to include teaching and learning related to classroom culture, student collaboration, and/or project management tools or skills, as appropriate for students or project milestone needs. Included links show examples of such activities.

VI. SCAFFOLDS Scaffolds are intended to be temporary supports that are removed when students no longer need them. These scaffolds can be used to support either content or the project process (e.g., need to know questions). Leverage "checking prior knowledge" to ensure you are offering the right scaffolds to the students who need them. Be sure to consider a wide range of needs, such as literacy skills, language acquisition levels, auditory/visual processing, building schema, learning style preferences, academic performance levels, etc.

VII. REFLECTION How will students reflect on their thinking, process, or learning?

VIII. STUDENT NEED TO KNOW QUESTIONS ADDRESSED Which student questions will be answered, or are you aiming to answer, during this instructional activity?

IX. TOOLS/RESOURCES Student-facing tools, human resources such as experts or community members, teacher tools, equipment, etc.