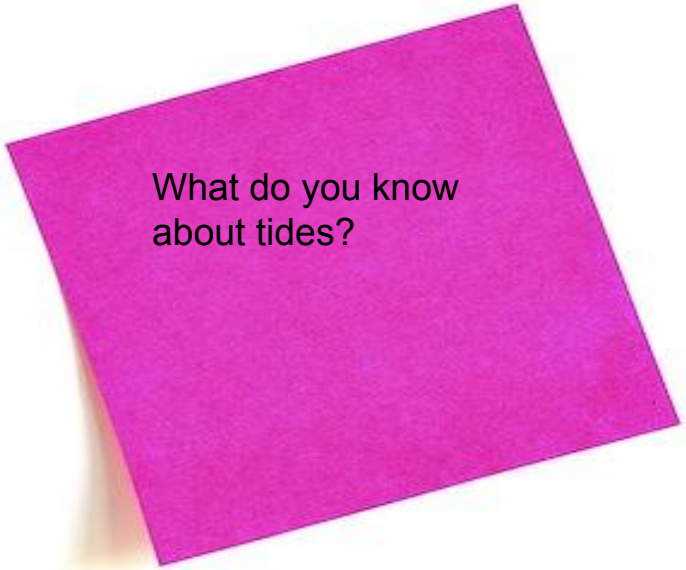
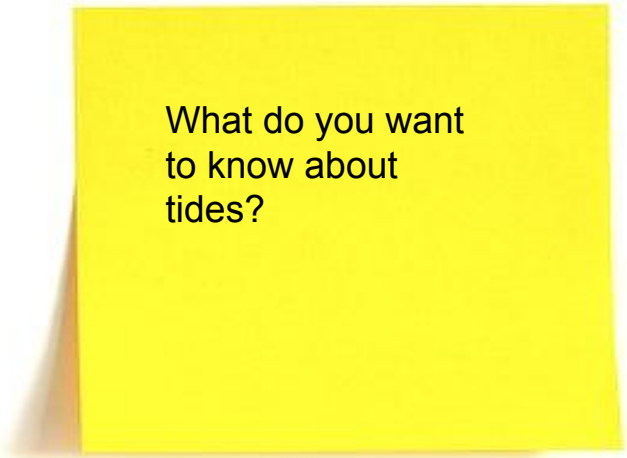
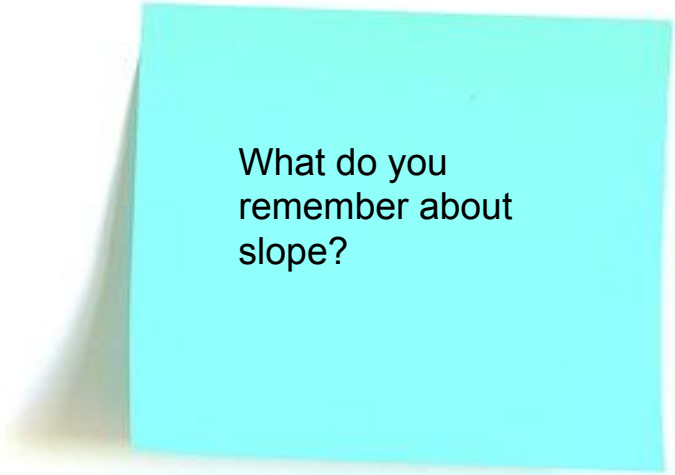
Kayak Race- Tides and Secant Lines



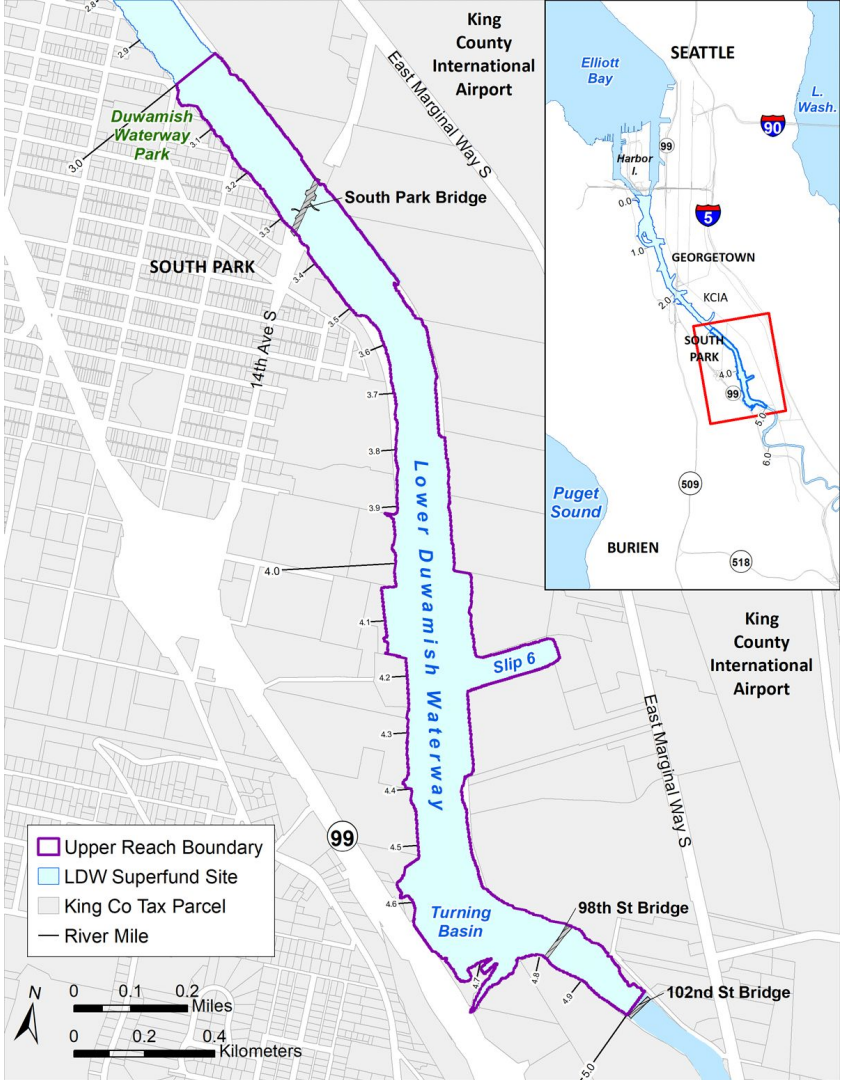


Write the answers to these questions on sticky notes and put them on the board.



You are entered in a doubles kayak race on the Duwamish Waterway. This is a specific type of race! ***The goal is to choose the best time to depart from Slip 6 to travel the farthest down river in one hour.***

Assumptions: The race is scheduled on a low wind day, and each team rows at the same speed. Your main variable to consider is the tide.



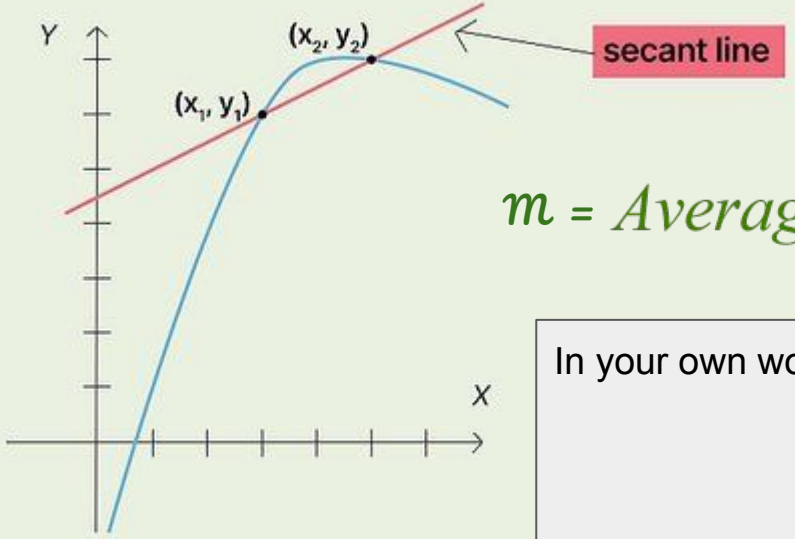
Watch the Puget Sound Model video to 2:17 to recall seeing the model and thinking about how the tides move in the Puget Sound region.
https://www.youtube.com/watch?v=OEQP5BwVh7A

Collect any notes about the model here:

Watch slope dude- https://www.youtube.com/watch?v=avS6C6_kvXM

When is the slope of a line positive?	
When is the slope of a line negative?	
When is it zero?	
When is it undefined?	
What is the relationship between the steepness of slope and rate of change?	

Slope and Rate of Change



$$m = \text{Average Rate of Change} = \frac{\Delta y}{\Delta x} = \frac{y_2 - y_1}{x_2 - x_1}$$

In your own words what is a secant line?

Simulation: https://javalab.org/en/tides_en/

Look at the simulation of the tides showing the tide going up and down.

- When the water goes down (“tide going out”, ebb current), where does the water go? If you were in a boat, what would this feel like?

- Which part of the graph corresponds to the tide going out?

- When the water goes up (“tide going in”, flood current), where does the water go? If you were in a boat, what would this feel like?

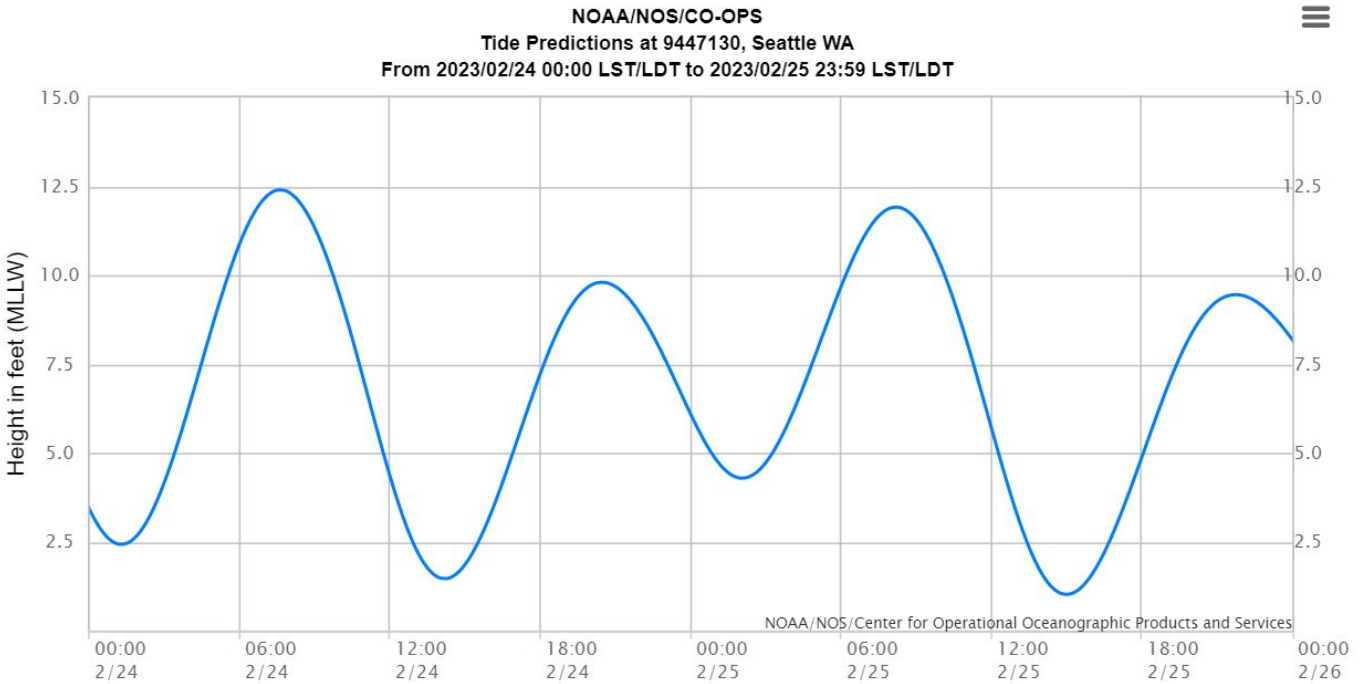
- Which part of the graph corresponds to the tide going in?

Tide table for Duwamish Waterway

Highlight in orange where the flood tides are on the graph.

Highlight in yellow where the ebb tides are on the graph.

Leave the places where the tide changes blank.



Work in pairs to decide on the best one hour window to complete your race.

You can use this tidal graph. You must complete your one hour race between 2/24 and 2/25.

Use the average rate of change (slope) formula to support your decision.

*the time stamps are in hours and minutes, consider your units as you use the formula.

You must include calculations for at least 3 different race windows and your rationale for the one you believe is best.

(Time Start, Water Level Start)

(X_1, Y_1)

(Time End, Water Level End)

(X_2, Y_2)

$$Average\ Rate\ of\ Change = \frac{\Delta y}{\Delta x} = \frac{y_2 - y_1}{x_2 - x_1}$$

	Race Window #1	Race Window #2	Race Window #3
Time Start:			
Time End:			
Water Level Start:			
Water Level End:			
Calculations			

Share:

Each pair will share out their final decision with evidence to support why they think they will be able to cover the most distance during that hour. Record your key points for your share out below. You may write on the board or Promethean to help your explanation.