

TRADITIONAL WEATHER FORECAST: OCEAN AND TIDES GR: 6-8 (LESSON 2)

Elder Quote/Belief:

“Stay away from certain places around Tatitlek, because of the strong tides.”
 -Robert “Chung” Vlasoff



“When you are traveling by boat, leave earlier so you don’t have to travel in the dark.”
 -Tom Anderson, Cordova

Grade Level: 6-8

Overview:

The communities in the Chugach Region are along the coastline and most of our activities involve going out on a boat (or skiff) to gather foods from the sea, travel to another community, or to just enjoy being out on the water. Knowing the tide schedule is important to plan water activities according to the tide. By staying observant to the wind direction, weather and tides, a person can avoid being caught in rough weather.

Standards:

<i>AK Cultural:</i>	<i>AK Content Science:</i>	<i>CRCC:</i>
A (3) Culturally-knowledgeable students are well grounded in the cultural heritage and traditions of their community.	D (3) Concepts of earth science. A student should understand and be able to apply the concepts, processes, theories, models, evidence, and systems of earth and space sciences.	Survival S (7) Students should be able to learn/observe the weather and tides.

Lesson Goal: Students will learn how to observe the tides and predict the weather

Lesson Objective(s): Students will:

- Learn the Sugt'stun/ Eyak vocabulary words
- Learn how to read a tide book
- Learn to observe the ocean before traveling on the water

Vocabulary Words: Sugt'stun Dialects

English:	Prince William Sound:	Lower Cook Inlet:	Eyak:
big ground swells that are breaking on the beach across the bay		Nmerneret	
Wave		Qailiq	
Low tide		Ken'aq	
High tide		Tung'iq	
Wave breaks		Qagerluni	
Weather is calm		Pinarlluku	
Tide goes out		Kenlluni	
Tide comes in		Tung'irluni	

Materials/Resources Needed:

- Copies of activity worksheet "Times of Tides"
- Computers, printer
- Recent tide books or online copies of a tide table

Books:

- Tide Table tide books
- *Chugach Navigation* by W.W. Mitchell

Websites:

- NOAA
 - <https://oceanservice.noaa.gov/facts/find-tides-currents.html>
 - https://tidesandcurrents.noaa.gov/tide_predictions.html?gid=1391
- DNR Tide Table websites www.dnr.state.ak.us/parks/boating/tides.htm
- Marine Weather <http://pafc.arh.noaa.gov/marfctst.php>

Teacher Preparation:

- Invite an Elder or Recognized Expert to share with the class about TEK on oceans and tides and subsistence activities done during different tidal movements.
- Make copies of the activity worksheet for each student.
- Collect current tide books for classroom use.
- Determine dates for the field trip activity and get required paperwork needed for parent permission.
 - Make sure the field trip to the beach is during high tide and over the week, return daily to the same spot for students to measure how the tides change.

Opening:

Not only is it important to know the weather, the Elders feel it is important that as coastal people, we learn about tides. Being able to read the weather and tides, allows us to make a more informed decision when planning for subsistence activities around the water. Today, we will learn how to read a tide book.

It is important to know what subsistence activities are done during high tides and or during low tides. Activities such as harvesting fish, shellfish or hunting all revolve around the tides, so the Elders have expressed the importance of learning how to read the tides in order to be safe and successful for coastal activities.

After we do research on tidal movement, you will each create a PowerPoint presentation that explains how tides are created, include Sugt'stun/Eyak vocabulary words, and a list of traditional subsistence activities done during the high and low tides.

Activities:

Class I:

1. Introduce the Elder or Recognized Expert to share their expertise on tidal movement and subsistence activities that correlate to the tides.
2. Pass around the tide books for students to peruse and explain how the moon's gravitational force pulls the ocean. As the world turns the moon pulls the ocean towards itself which is what makes the low and high tides. Excerpt from NOAA:
 - a. Tides are really big waves that move through the ocean in response to the forces exerted by the Moon and the Sun. Tides involve water moving *up and down*. Currents involve the movement of water *back and forth*, driven by factors such as tides, wind, the shape of the land, and even water temperature.
3. Ask the students to go online to the National Ocean Atmospheric Administration (NOAA) and Division of Natural Resources (DNR) websites and find the tide schedule for their region. Tide books are made for regions across the state, if you look in the tide book, you can see how it shows tides for different coastal communities.
 - a. <https://oceanservice.noaa.gov/facts/find-tides-currents.html>
 - b. https://tidesandcurrents.noaa.gov/tide_predictions.html?gid=1391
 - c. www.dnr.state.ak.us/parks/boating/tides.htm
4. Have the students print off the recent tide schedule for the recent month and year.

5. Pass out the activity worksheet “Times of Tides” to each student. Referring to the printed copy of the community’s tide schedule, ask the students to fill out the worksheet with correct dates, times and the tide schedule.
6. Inform the students they will be creating a PowerPoint presentation to explain the difference between high, low, minus, and hold over tides. Explain to the students the PowerPoint presentation should be created as if teaching tides and subsequent subsistence activities to an elementary class. Begin the presentation with explaining how the moon’s gravitational force creates the tides. Then lead into the rest of presentation explaining high and low tides including a list of coastal activities done during the high and low tides.
7. The PowerPoint presentation needs to include the following elements and answer/explain the following questions:
 - a) How are tides created?
 - b) Why does the tide change by an hour each day?
 - c) Why do the tides increase up to the peak and then recede?
 - d) How do the Moon, season and wind play a factor?
 - e) Does weather/wind affect the tide?
 - f) What does the wind cause when mixed with the tides?
 - g) What subsistence activities can be done during these tides?
 - h) Include Sugt’stun/Eyak vocabulary words where applicable.
 - i) Include pictures/videos either:
 - a. Photos/video clips found online to help explain.
 - b. Photos/video clips of self or family participating in coastal activities during high and low tides with an explanation of what subsistence activity you are doing. Explain what the tide is like and why certain activities are best during that tide.
8. When you have finished save two copies on your computer, one for yourself and one for the teacher to evaluate and grade.
9. PowerPoint presentations will be graded based on how much information the student has put in explaining the tides and coastal activities revolving around the high and low tides.
10. OPTIONAL- submit the PowerPoint presentation to Chugachmiut Cultural Heritage Preservation to be shared on the website.

Assessments:

- Students are able to correctly read a tide book.
- Students can pronounce, understand and incorporated the Sugt’stun and Eyak vocabulary words into PowerPoint presentation.
- Students create a PowerPoint that explains tide movement/schedule and a list of coastal activities that correlate with the tide schedule with required elements.

Example of Tidal Schedule for Homer, Alaska

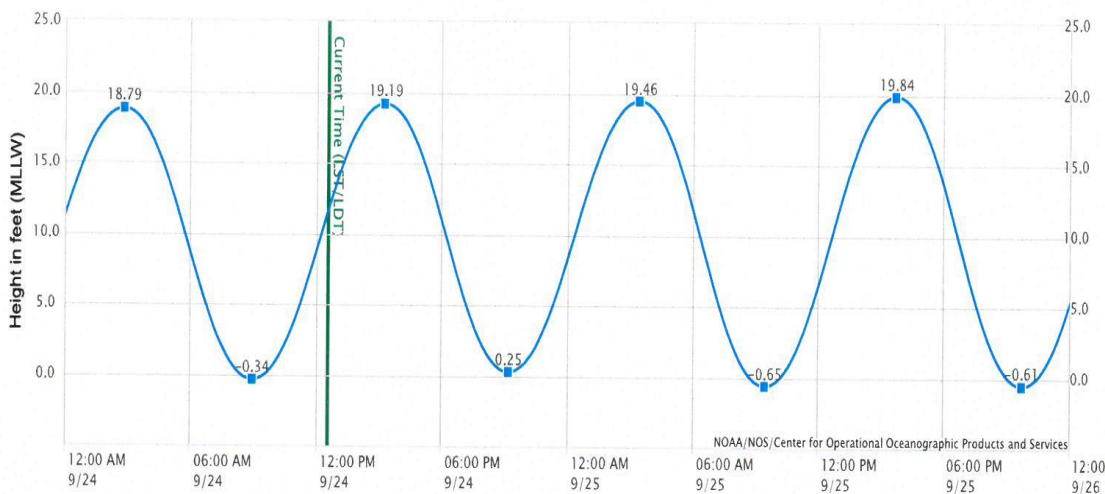
9/24/2018

HOMER, AK 9455557 Tidal Data Print View



[Help](#)

NOAA/NOS/CO-OPS
Tide Predictions at 9455557, HOMER AK
 From 2018/09/24 12:00 AM LST/LDT to 2018/09/25 11:59 PM LST/LDT
 Subordinate Station | Ref. Station (Seldovia 9455500) | Time offsets (high: 5 min. low: 3 min.) | Height offsets (high: *1.01 ft. low: *0.97 ft.)



Note: The interval is High/Low, the solid blue line depicts a curve fit between the high and low values and approximates the segments between.
 Disclaimer: These data are based upon the latest information available as of the date of your request, and may differ from the published tide tables.

High/Low Tide Prediction Data Listing

Station Name: HOMER, AK
 Action: Daily
 Product: Tide Predictions
 Start Date & Time: 2018/9/24 12:00 AM
 End Date & Time: 2018/9/25 11:59 PM

Source: NOAA/NOS/CO-OPS
 Prediction Type: Subordinate
 Datum: MLLW
 Height Units: Feet
 Time Zone: LST/LDT

Date	Day	Time	Hgt	Time	Hgt	Time	Hgt	Time	Hgt
2018/09/24	Mon	02:47 AM	18.79 H	08:56 AM	-0.34 L	3:15 PM	19.19 H	9:12 PM	0.25 L
2018/09/25	Tue	03:22 AM	19.46 H	09:26 AM	-0.65 L	3:43 PM	19.84 H	9:44 PM	-0.61 L

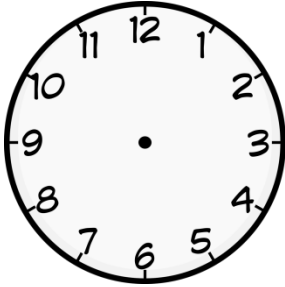
Times of the Tides

Date	High Tide	Low Tide
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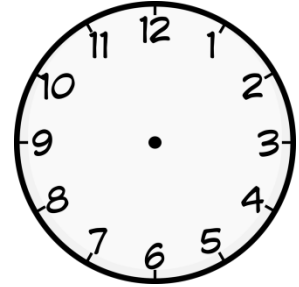
	AM	Size	PM	Size	AM	Size	PM	Size
Monday								
Tuesday								
Wednesday								
Thursday								
Friday								
Saturday								
Sunday								

Monday

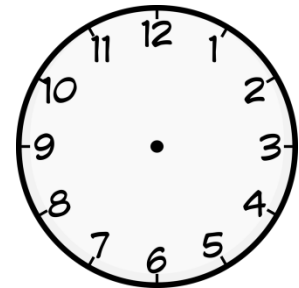
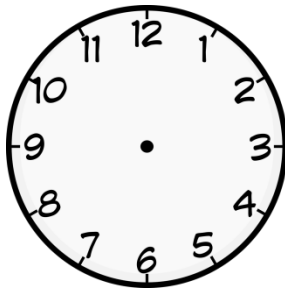
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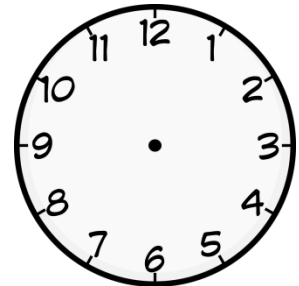
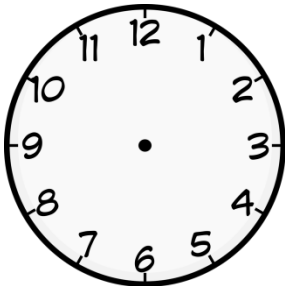
High Tide



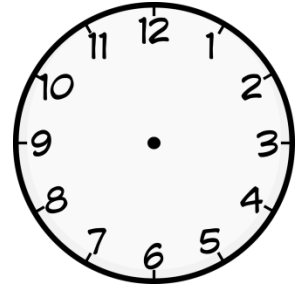
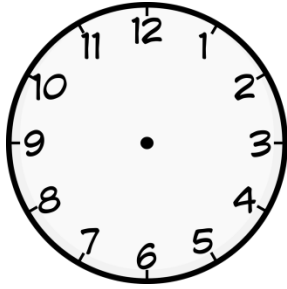
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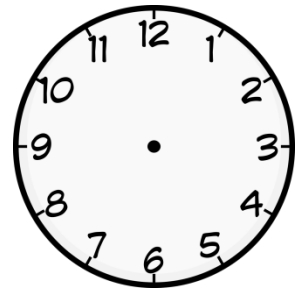
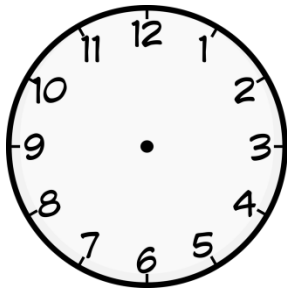
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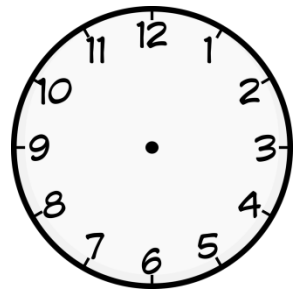
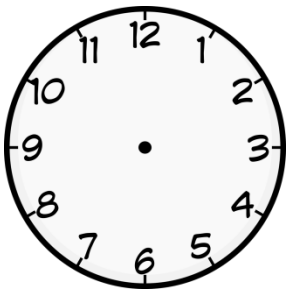
Thursday



Friday



Saturday



Sunday

