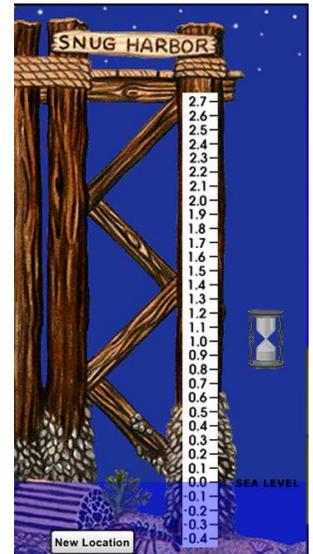


Name _____ Date _____

How Are Tides Affected by Phases of the Moon?

Earth's oceans are constantly in motion. These motions are affected by both the Sun and the Moon. They cause ocean levels to rise and fall periodically due to their gravitational pull. These changes in levels are called tides. Every location on Earth experiences two high tides and two low tides a day. During some parts of the year, tides are higher than normal or lower than normal due to the alignment of the Sun, Earth and Moon.

In this virtual lab, you examine the Moon's affect on tides during the month of April, 2009. You will measure, record and graph the high and low tides during four major Moon phases.



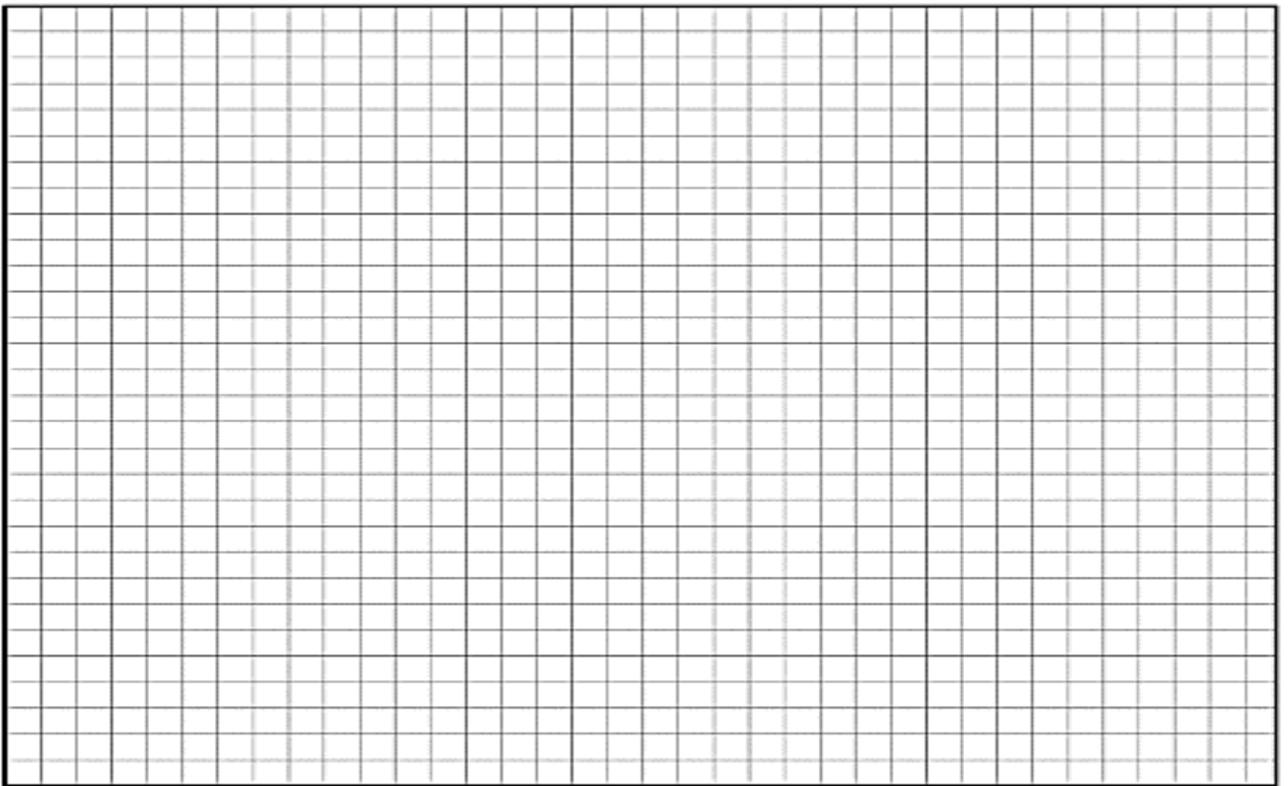
Procedure (if link is broken for some reason, Google "Glencoe Ocean Motion" for the right website)

1. Go to: <http://goo.gl/IBR7jf>
2. Select a phase of the Moon by clicking on one of the four circles around the Earth in the diagram above the calendar.
3. Examine the calendar to find out when the selected phase of the Moon occurs. Record the date in column (2) on Table 1.
Calendar abbreviations are: NM=New Moon; FM=Full Moon; FQ=First Quarter; LQ=Last Quarter
4. Observe the water level at 12:00 A.M. Record the initial level in column (3) on Table 1.
5. Click on the hour glass. When it is done rotating, record the time in column (4) in Table 1 and click on the meter arrows to record the correct water level (remember, tides that decrease can be negative, look closely).
6. Repeat Step 5 by clicking on the hourglass until you have recorded information for **2** high tides and **2** low tides.
7. Circle the highest tide of each moon phase row.
8. Box the lowest tide of each moon phase row.
9. Record the greatest difference between the highest tide and the lowest tide in each row in column (5).
10. Click on a different moon phase to begin collecting tide information for another Moon phase.
11. Repeat steps 5-10 until you have tide information for all 4 phases of the Moon.
12. Graph your high and low tide information for all four phases on the **SAME GRAPH**.
13. Answer Analysis questions.

Table 1 Title: _____

Moon Phase	Date (2)	12 A.M. Level (3)	Low tide 1 (4)		High Tide 1 (4)		Low Tide 2 (4)		High Tide 2 (4)		Greatest Difference (5)
			Time	Level	Time	Level	Time	Level	Time	Level	
New Moon											
Full Moon											
First Quarter											
Last Quarter											

Graph 1 Title: _____



Resources that can help in your analysis:

Tides: <https://www.ck12.org/earth-science/Tides/lesson/Tides-HS-ES/>

What causes tides: <https://scijinks.gov/tides/>

Tides 101: https://www.galvnews.com/lifestyle/free/article_14405fde-46c3-11e4-96e1-0017a43b2370.html

ANALYSIS

1. What is the name of the location where your tide measurements were taken?
2. During which phase of the moon were tides the highest? _____
3. The lowest? _____
4. What is the cause for this?
5. What type of tides (**Spring** or **Neap**) occur during each of the moon phases? Explain your answers using your graph and the positions of the Earth, Moon and Sun. (*You should do a little bit of research here*).
 - a. New Moon:
 - b. Full Moon:
 - c. First Quarter:
 - d. Last Quarter:

