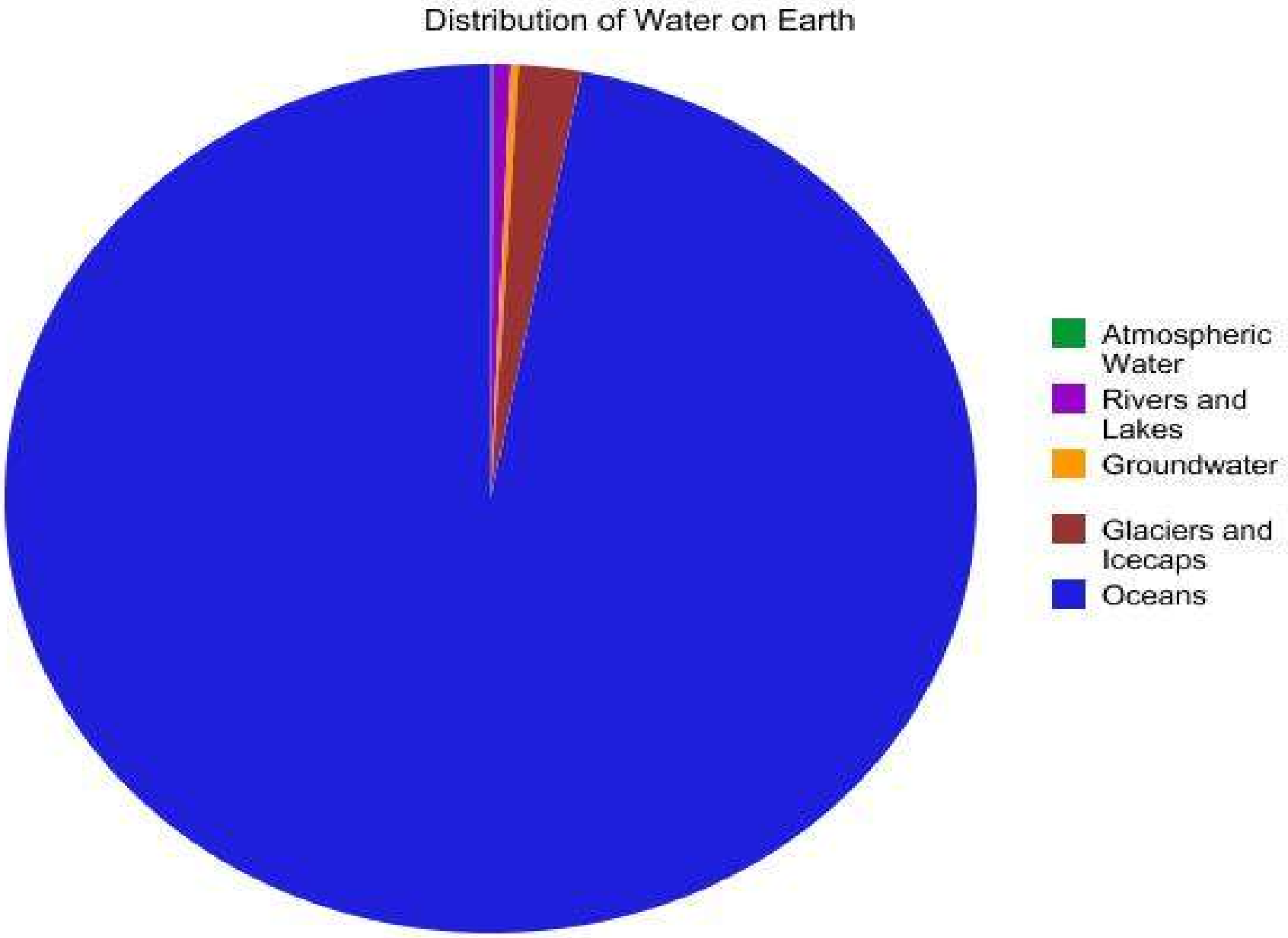
Watch the video below. Identify the phenomena and why it occurs.

https://www.youtube.com/watch?v=sMKvqMUZwV4


Distribution of Water on Earth
Atmospheric Water
Rivers and Lakes
Groundwater
Glaciers and Icecaps
Oceans

Essential Question: What causes Tides?

Standard:
S6E3d. Explain the causes of waves, currents, and tides.

Use Your Notes Sheet to Record Important Information

Tides

Name _____ Date _____ Period ___

1. What are tides? _____

2. High tides are when water reaches its _____ and low tides are when water reaches its _____.

3. What causes tides? _____

4. Why does the Moon have a greater gravitational pull than the Sun? _____

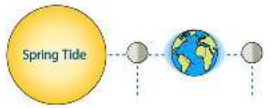
5. As Earth rotates, different places on the planet's surface _____

6. Label the High Tides and the Low Tides on the diagram to the right.

7. Changes in the position of _____

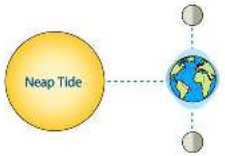
8. Describe Spring Tides: _____

9. Label the Spring Tide diagram including the two moon phases and the high and low tides.



10. Describe Neap Tides: _____

11. Label the Neap Tide diagram including the two moon phases and the high and low tides.



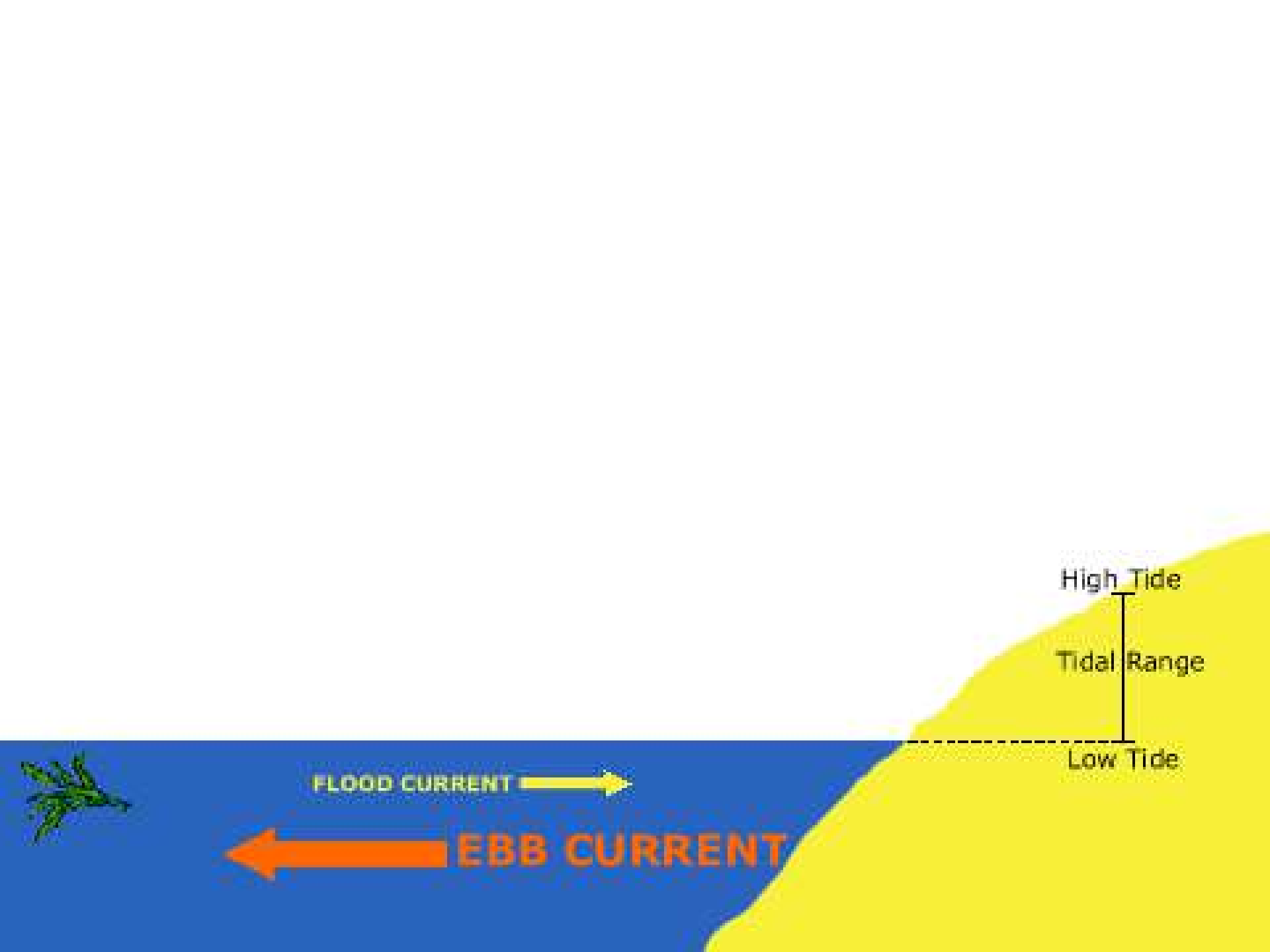
12. Tides occur at different times each day because _____

What Are Tides?

- 1. Tides are the daily rise and fall of Earth's waters on its coastlines.

- As the tide comes in, the level of water on the beach rises, and as the tide goes out, the level of water on the beach goes down.

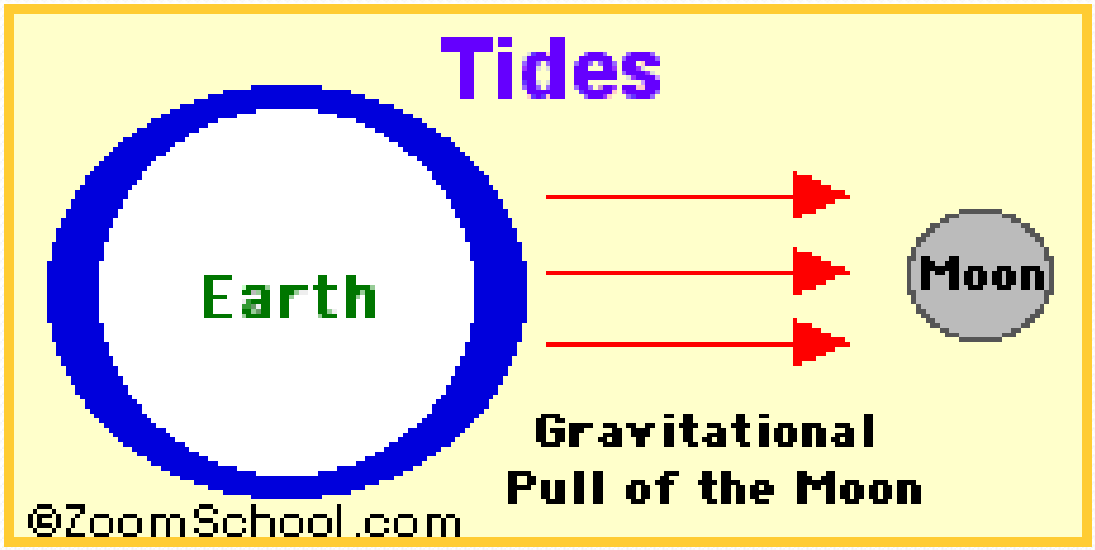
2. High tides are when the water reaches its highest point. Low tides are when the water reaches its lowest point.


High Tide
Tidal Range
Low Tide
FLOOD CURRENT
EBB CURRENT

What Causes Tides?

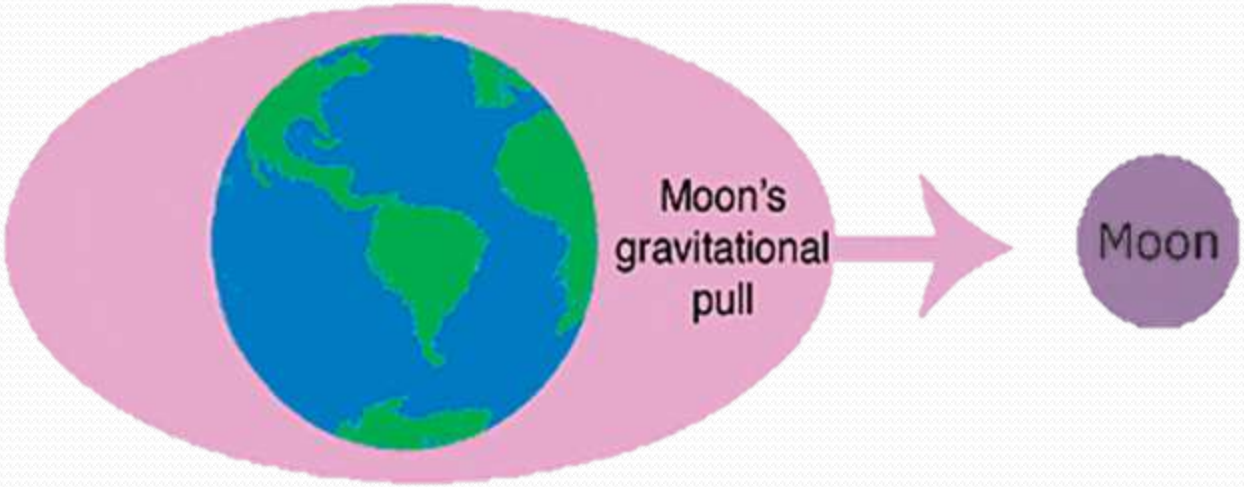
3. The gravitational pull from the Moon, and the rotation of the Earth cause the ocean water to bulge, creating tides.

4. Since the Moon is close to the Earth, it has a strong gravitational pull on it (closer objects have a stronger gravitational pull).



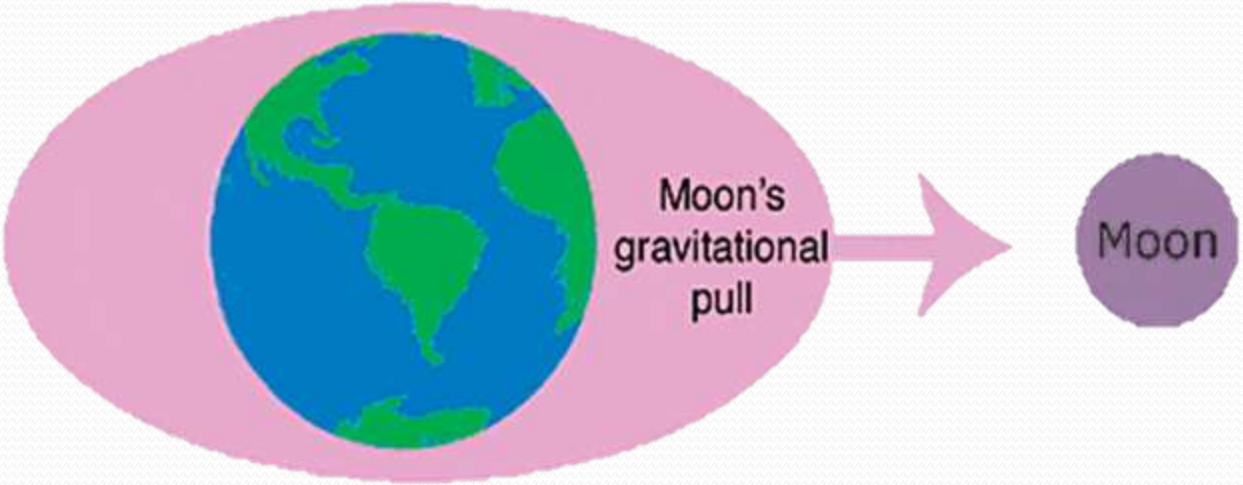
- The Moon pulls on the water on the side nearest to it more strongly than it pulls on the center of the Earth.

- This pull creates a bulge of water on the side of Earth facing the the Moon.

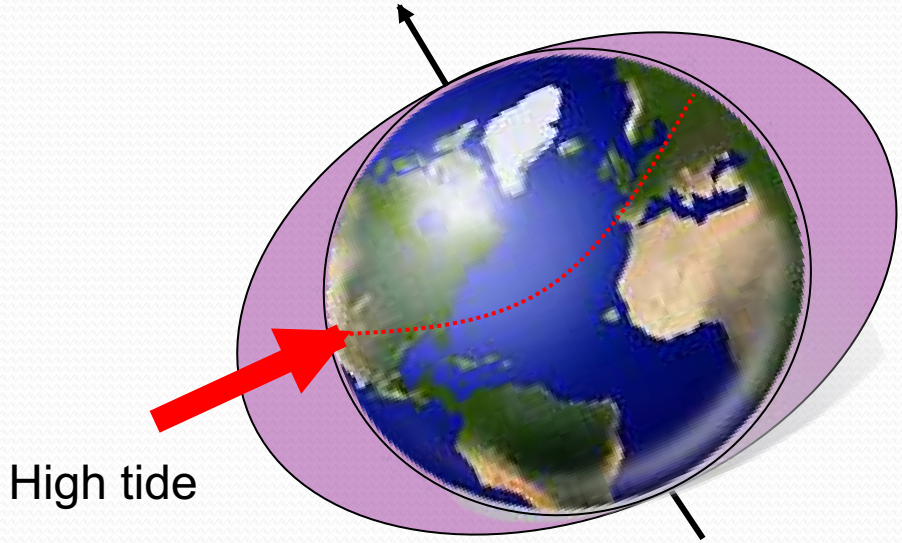


- The water on the side of Earth facing away from the Moon has a less strong pull.

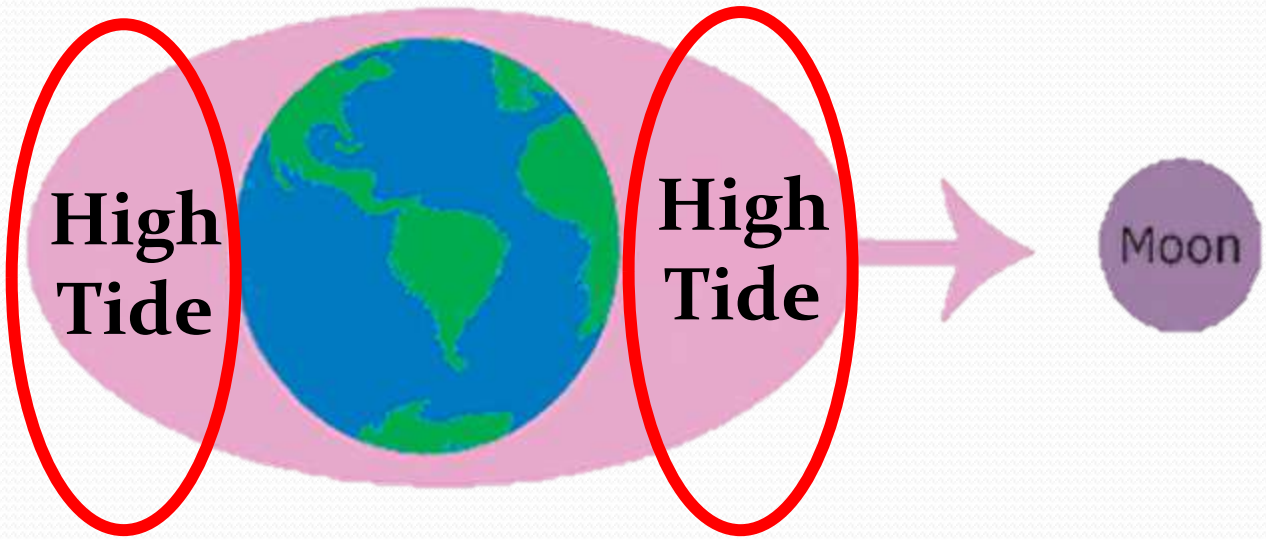
- 5. As Earth rotates, different places on the planet's surface pass through the areas of tidal bulges which then change water levels.



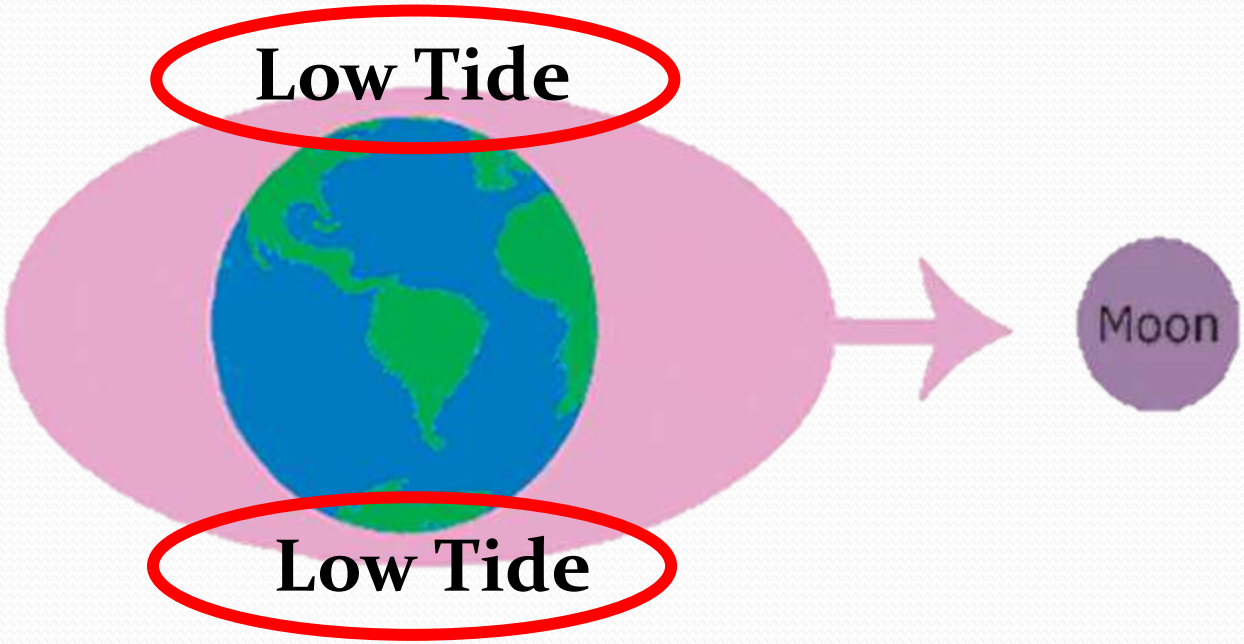
The Earth rotates one full turn in 24 hours, but the bulge of water stays on the side of the Earth facing the moon. The bulge stays in place as the Earth moves under it.



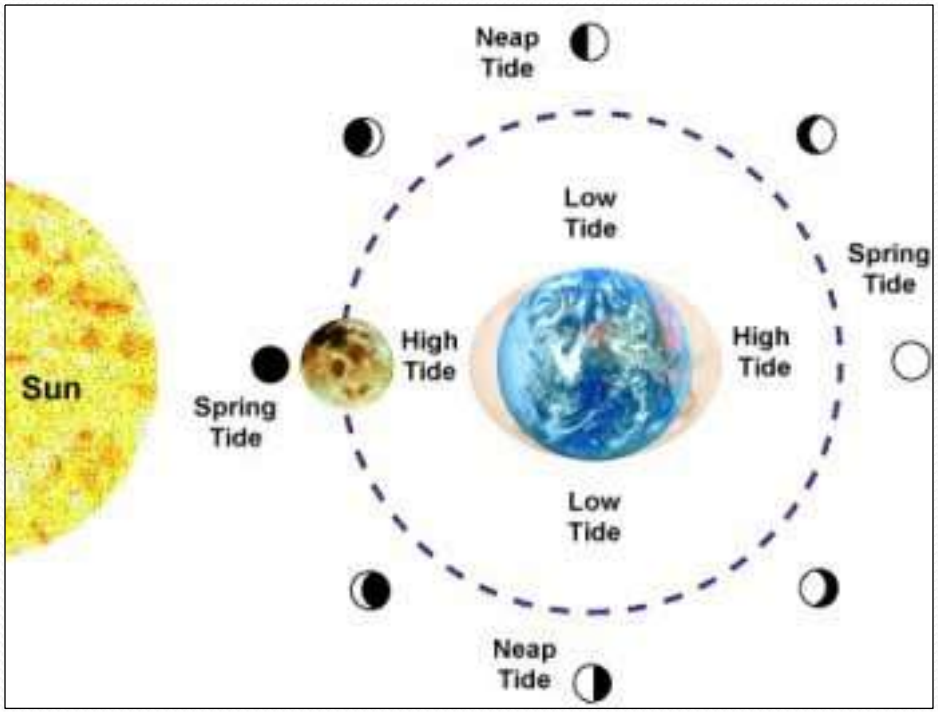
6. In places where there are tidal bulges, high tide is occurring along the coastlines.



6. In places between the tidal bulges, low tide is occurring along the coastlines.

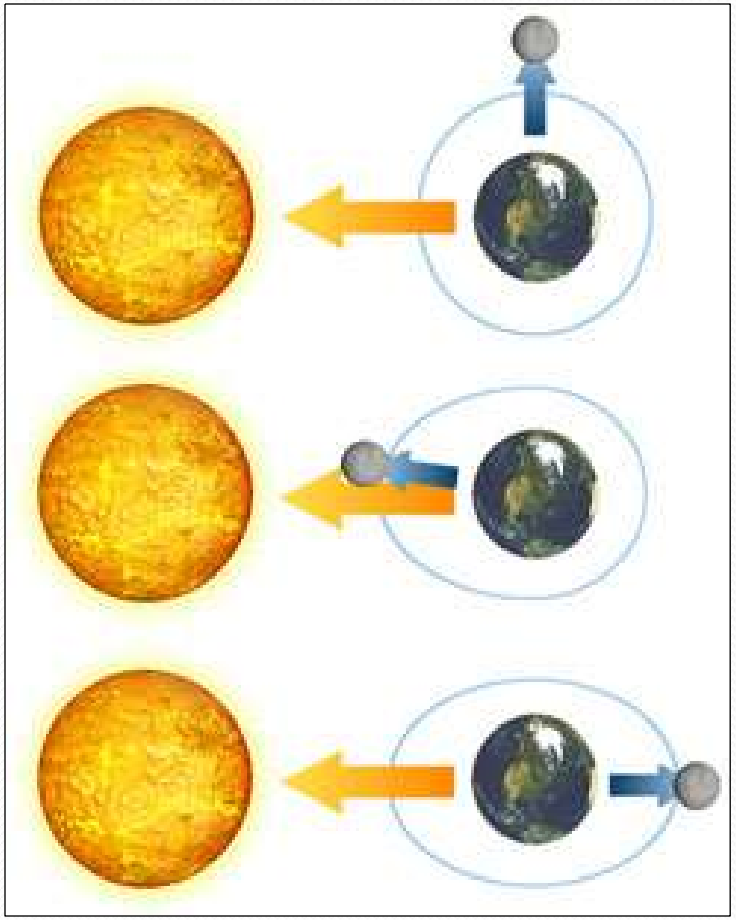


7. Changes in the positions of Earth, the Moon, and Sun affect the height of tides during a month.



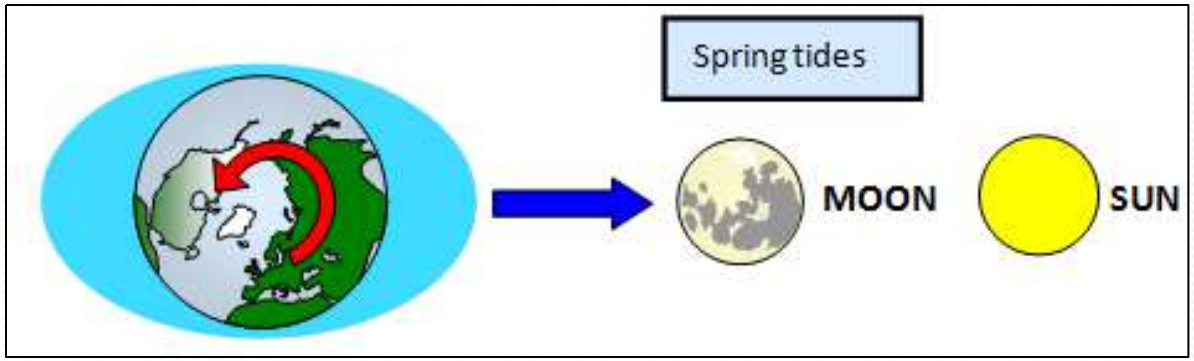
Sun's Gravity and Tides

- The Sun is so large that its gravity also affects tides.
- At times, the Sun and Moon pull together on Earth's waters in the same direction.
- At other times they pull in different directions.

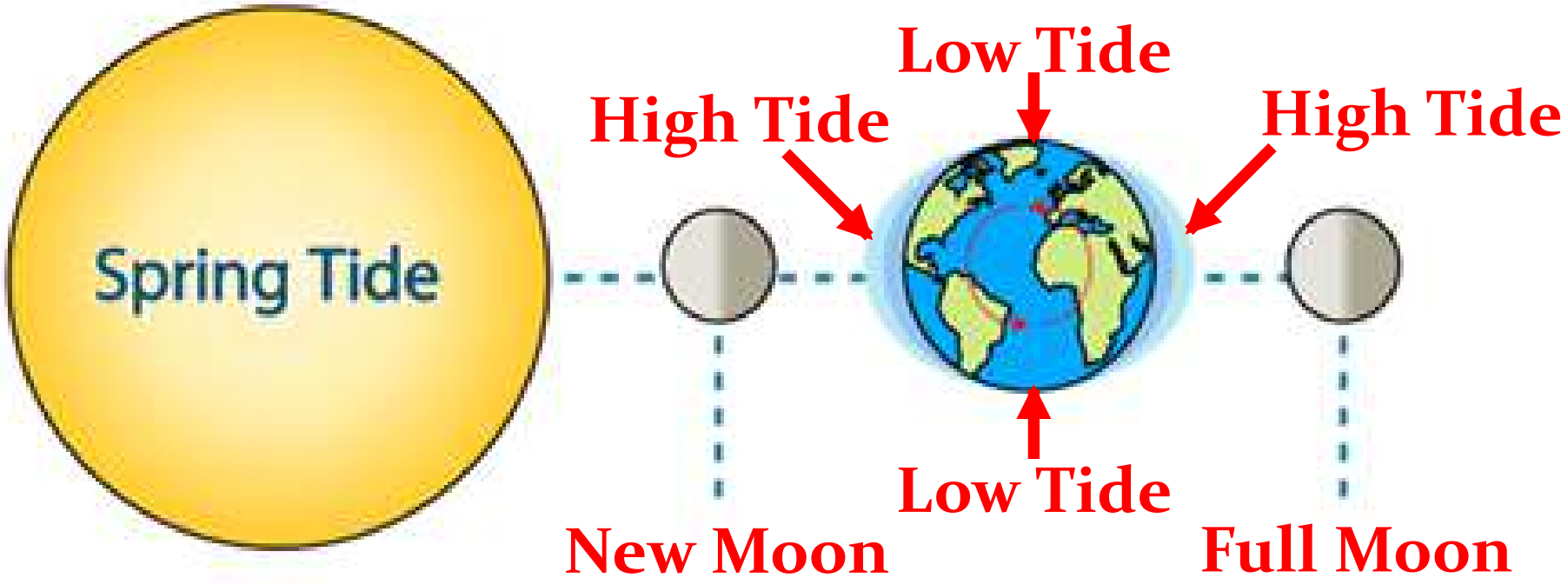


- 8. Spring tides occur 2 times a month, during a full and new moon when the Earth, Sun, and Moon are lined up.

- Spring tides are higher and lower than normal tides.



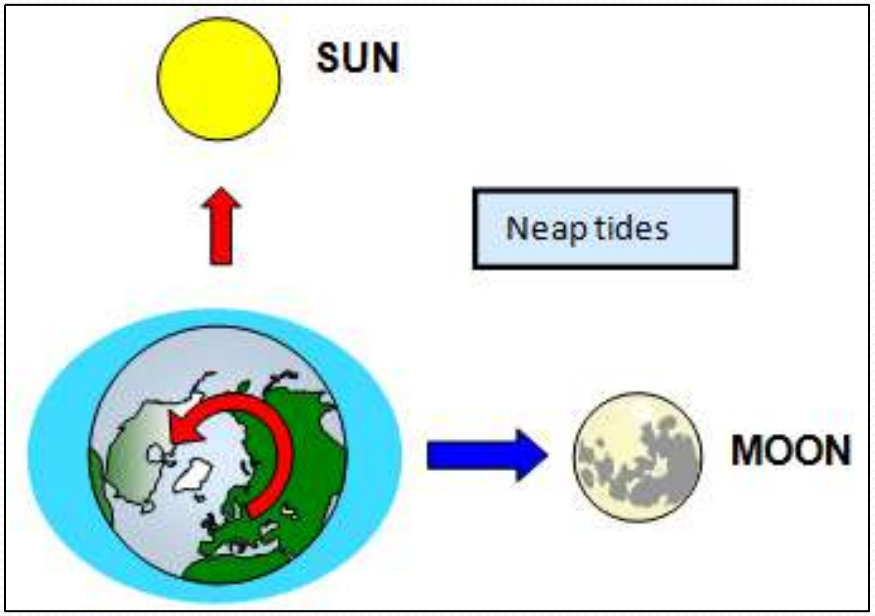
9.



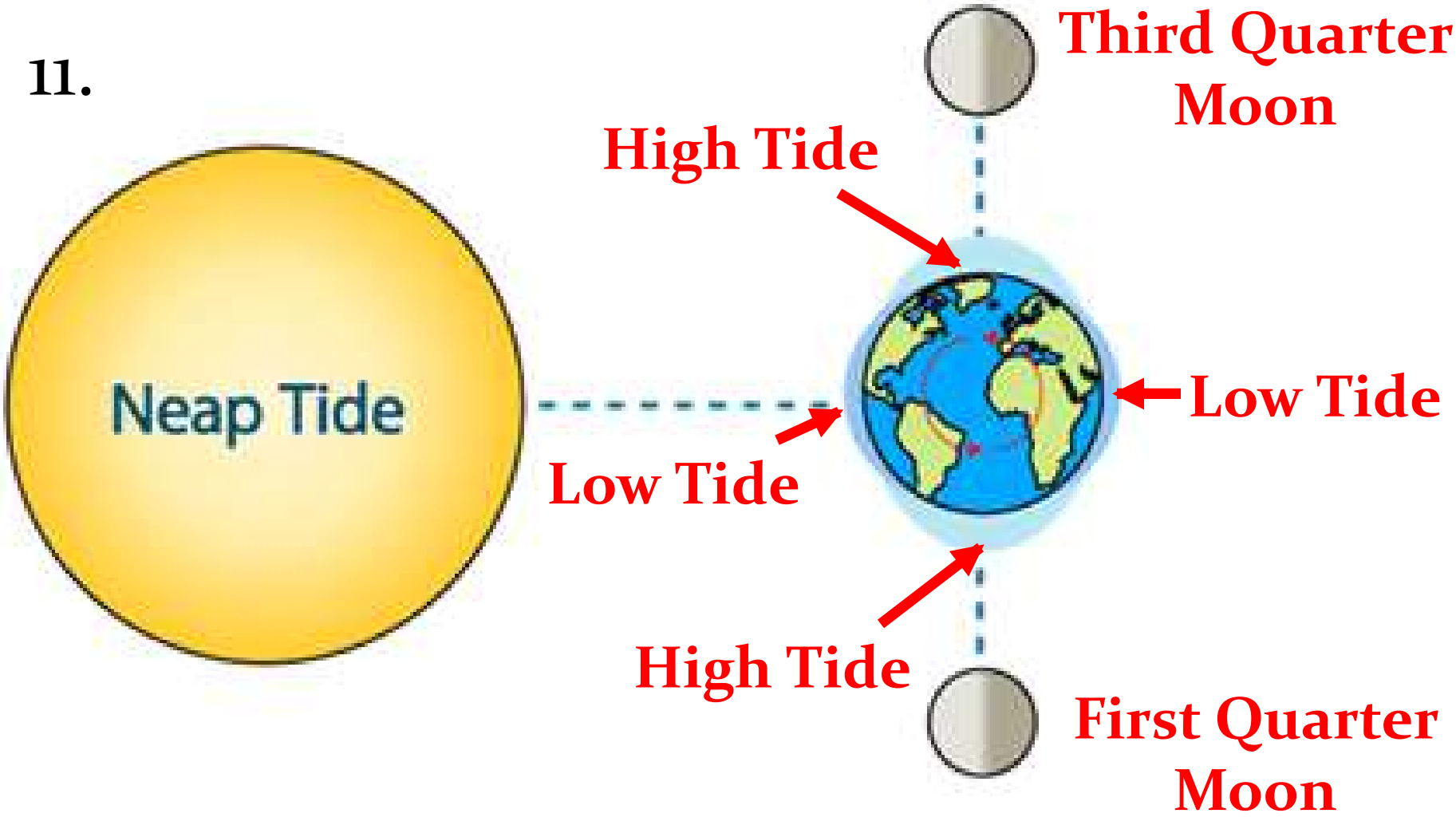
Spring Tide

- 10. Neap tides occur in between spring tides, at the first and third quarters of the Moon when the Sun and Moon pull at right angles to each other.

- Neap tides are not as high or low as normal tides.

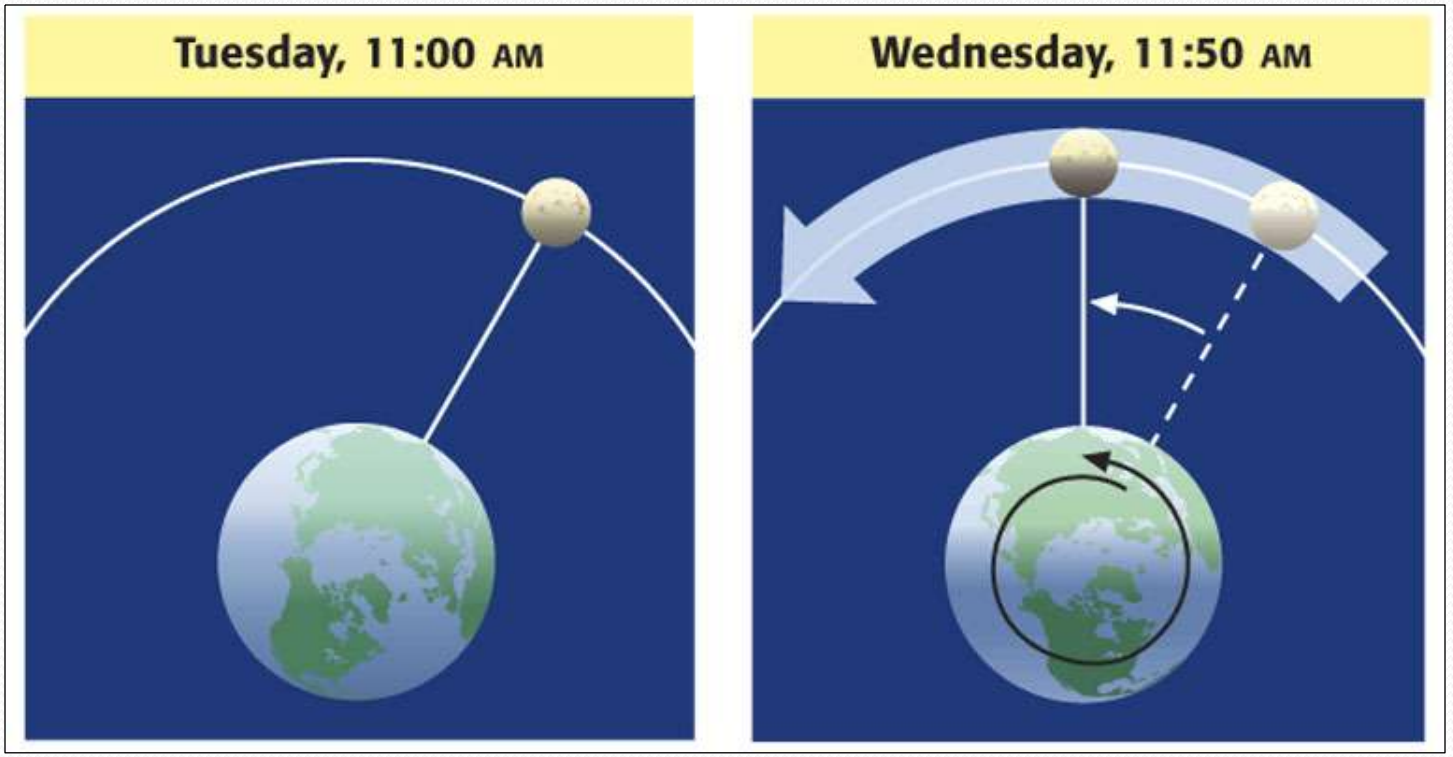


11.


Third Quarter Moon
High Tide
Neap Tide
Low Tide
Low Tide
High Tide
First Quarter Moon

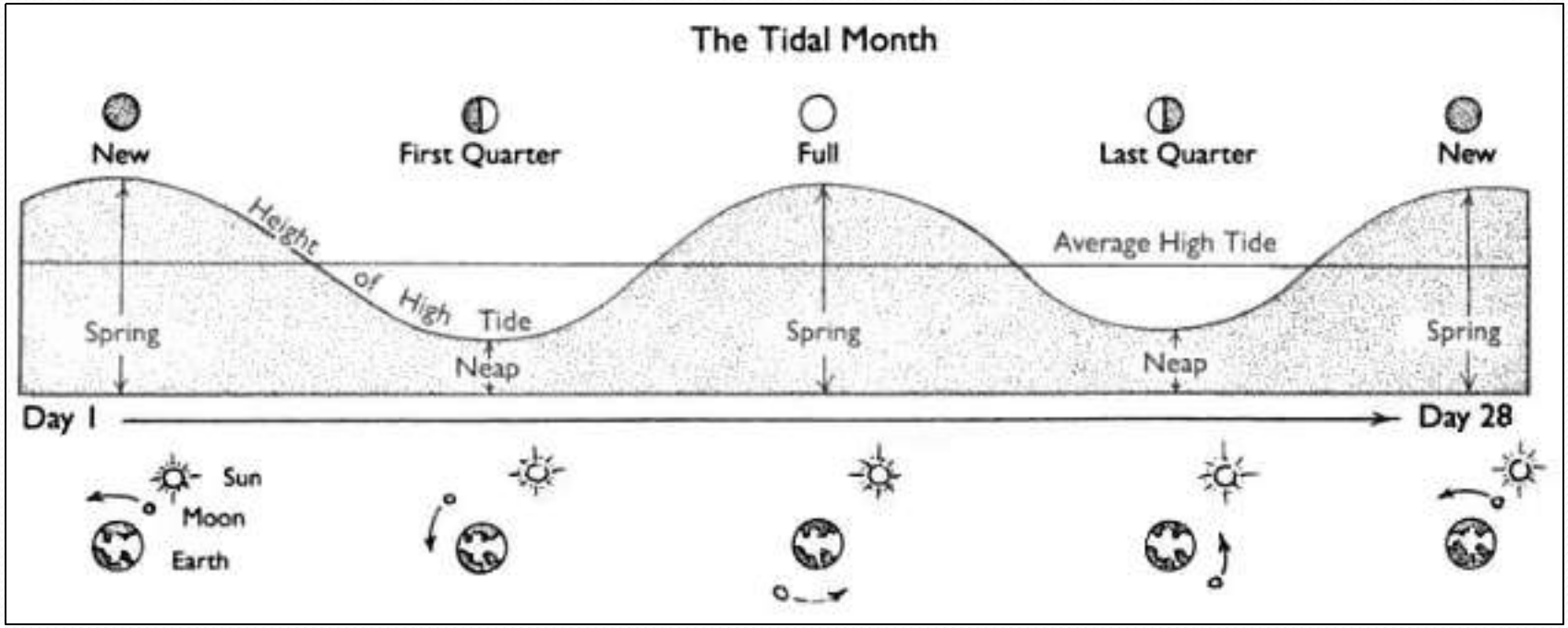
Neap Tide

12. Tides occur at different times each day because the Earth rotates more quickly than the moon revolves around the Earth.



Think, Pair, Share: Compare and Contrast Spring Tides and Neap Tides

Tides at a Monthly Glance

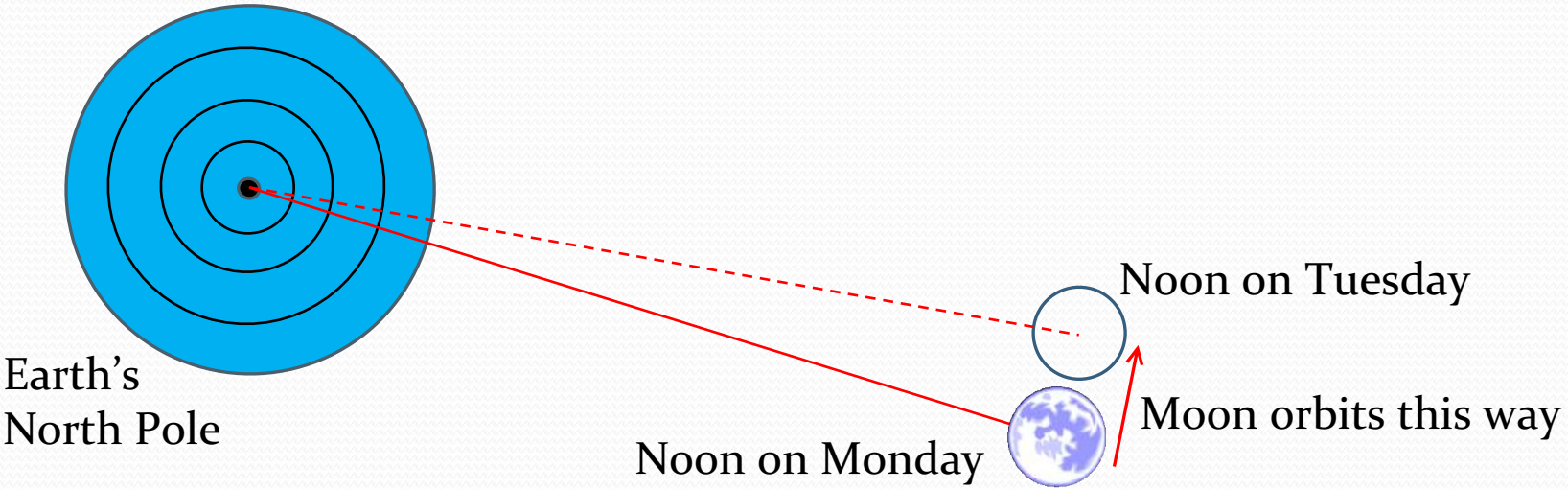


Study Jams Video

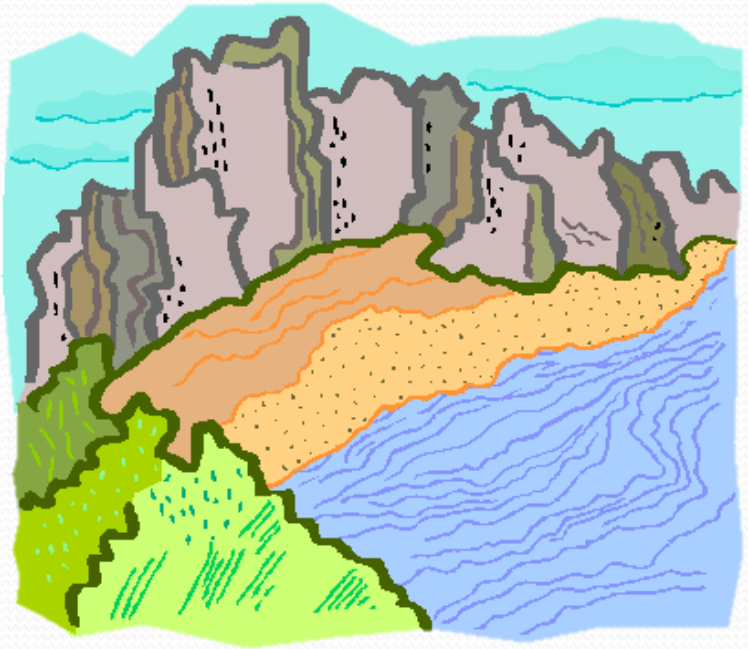
On Saturday at the beach, the water is highest at 11:15 a.m. On Sunday, the water is highest at 11:55 a.m. Why does the tide come in later?

The moon has moved a little, so the beach is closest to the moon at a later time.

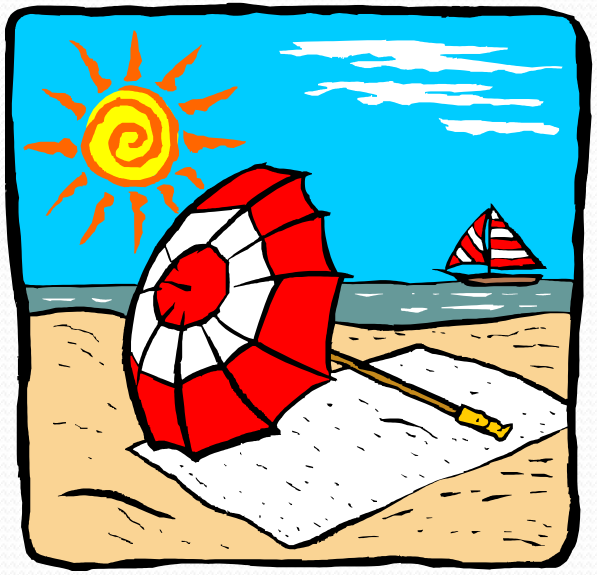
Another view…



Show What You Know…



You arrive at the beach at 9:00 A.M. You lay a towel on the sand, and then you run 30 steps to reach the water's edge. By 3:00 P.M., the water has almost reached your towel. What do you think happened?

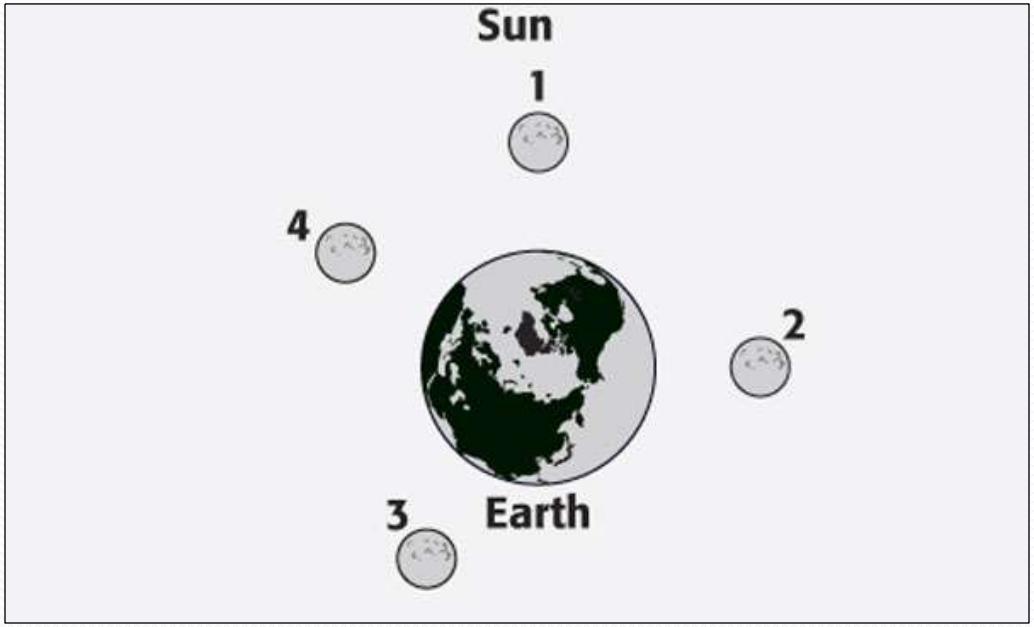


The tide came in.

You're on the beach at midnight. The moon is right overhead. Is the tide low or high? Why?

High tide because the moon is closest as it can be

The diagram below shows the possible positions of the moon relative to the Earth and sun during different tidal ranges. Use the diagram below to answer the questions that follow.



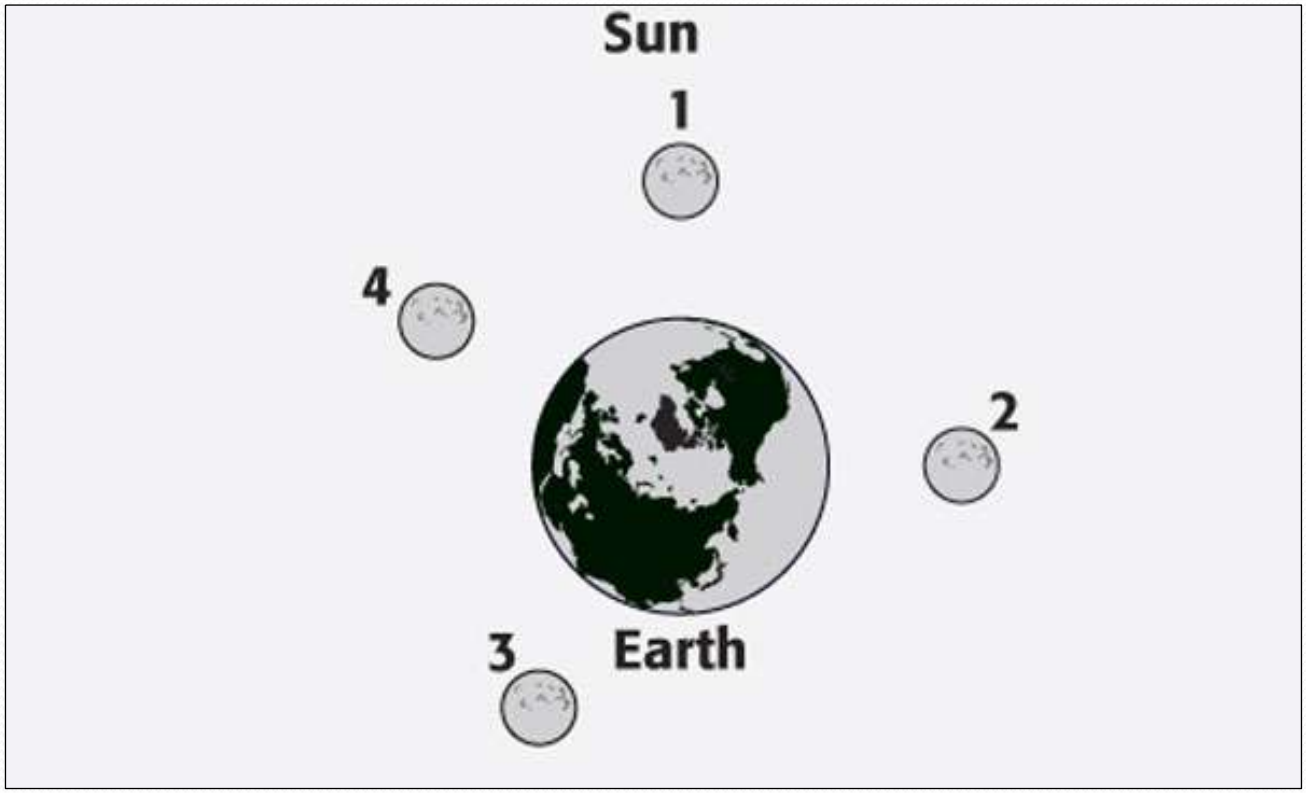
At which position would the moon be during a neap tide?

A. 1

B. 2

C. 3

D. 4



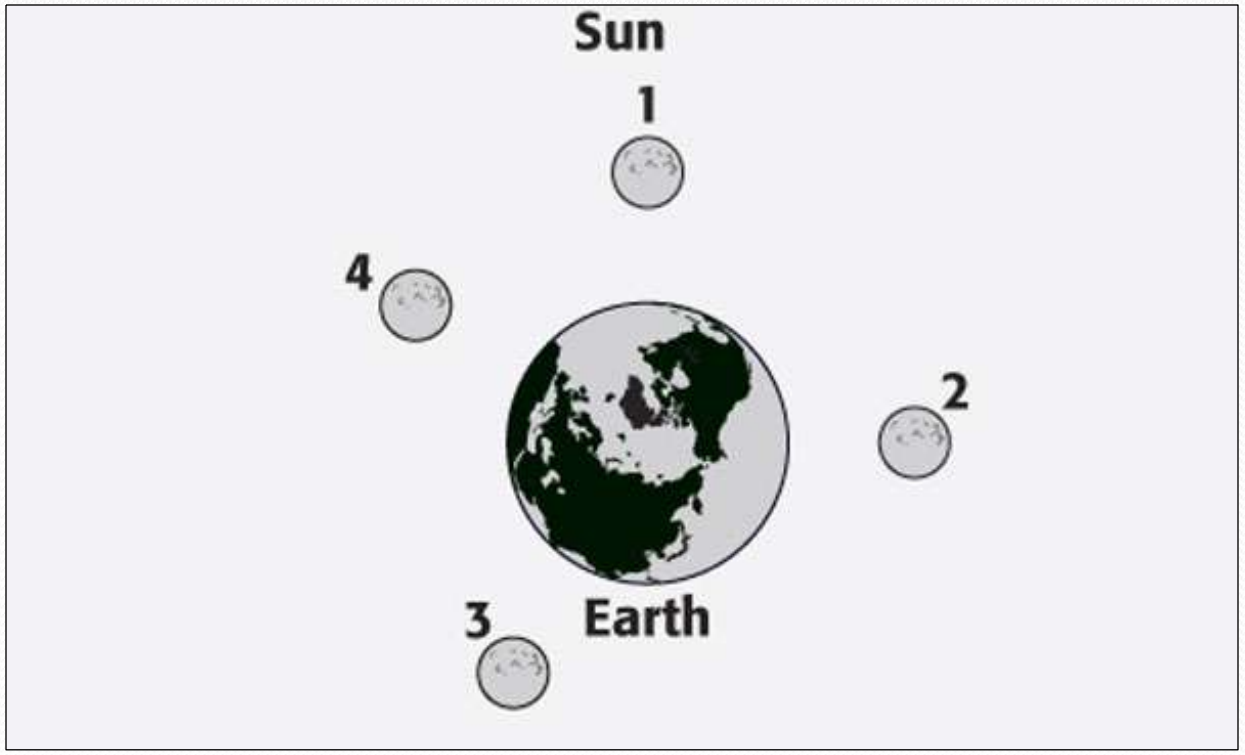
At which position would the moon be during a spring tide?

A. 1

B. 2

C. 3

D. 4



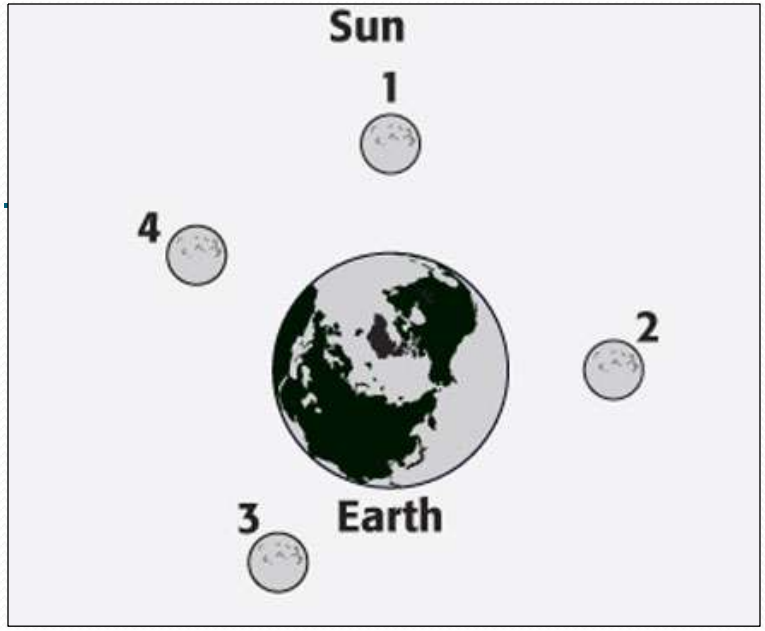
The tidal range would be greater when the moon is at position 3 than when the moon is at position 4 because…

A. position 4 forms a 90° angle with the sun and the Earth.

B. position 3 is very near a neap-tide position.

C. position 3 is very near a spring-tide position.

D. position 4 is very near a spring-tide position.



Tides Summarizer

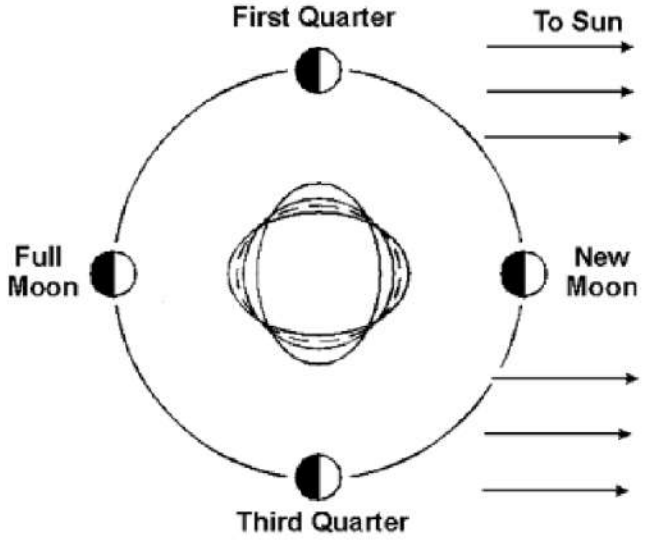
Tides Summarizer

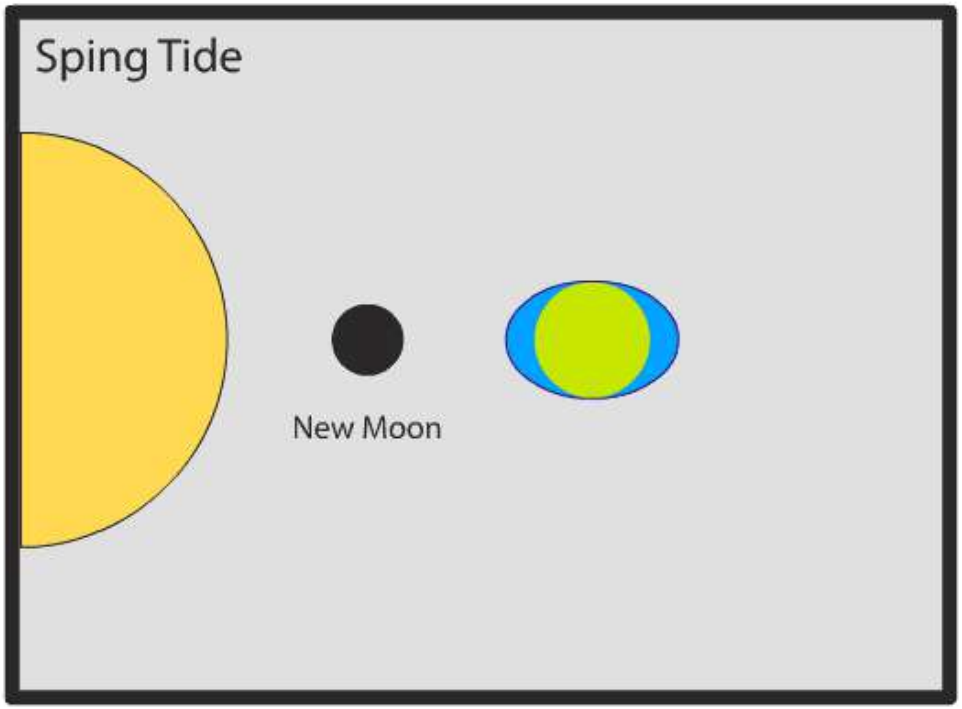
Name _____ Date _____ Period ___

1. What causes Tides?

2. Label Spring Tide and Neap Tides in the diagram.

3.Which type of tide has the highest high tide and the lowest low tide? Why?





http://ww2.valdosta.edu/~cbarnbau/astro_demos/tides/neap_sp.html

Spring and Neap Tides