

# The Moon & the Ocean Tides

A decorative graphic consisting of a thin blue arc at the top left and a larger blue wedge shape extending from the center towards the bottom right corner of the slide.

# Why does the Earth have tides?

- The sun and moon pull on the Earth's water causing the tides to rise

# Tides

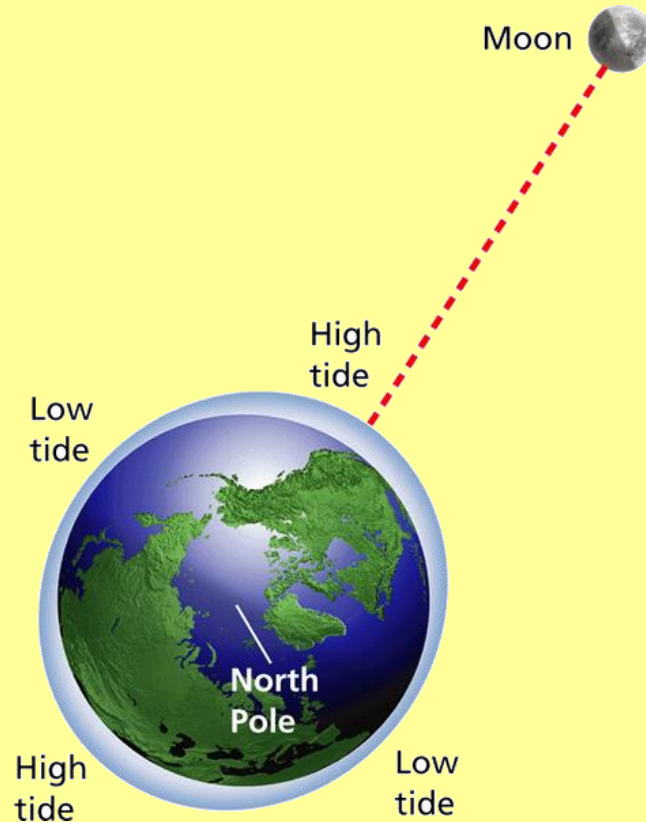
Periodic rise and fall of large bodies of water caused by the gravitational pull of the moon on the Earth.



The tides rise for 6 hours  
and then  
fall for 6 hours!

# What Causes Tides?

- Tides are caused by the interaction of Earth, the moon, and the sun's gravitational pulls.



# When are the tides?

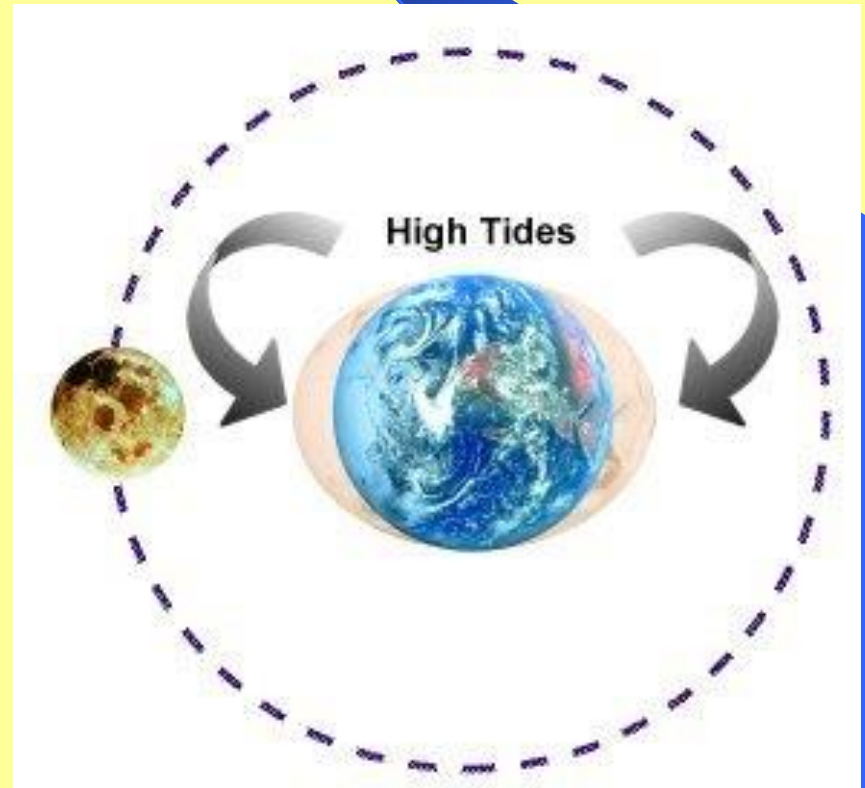
- There are 2 High Tides and 2 Low Tides every **day**.
- There are 2 Spring Tides and 2 Neap Tides each **month!**

*What could be causing these DAILY and MONTHLY changes?*

*What events do you know about that occur DAILY and MONTHLY?*

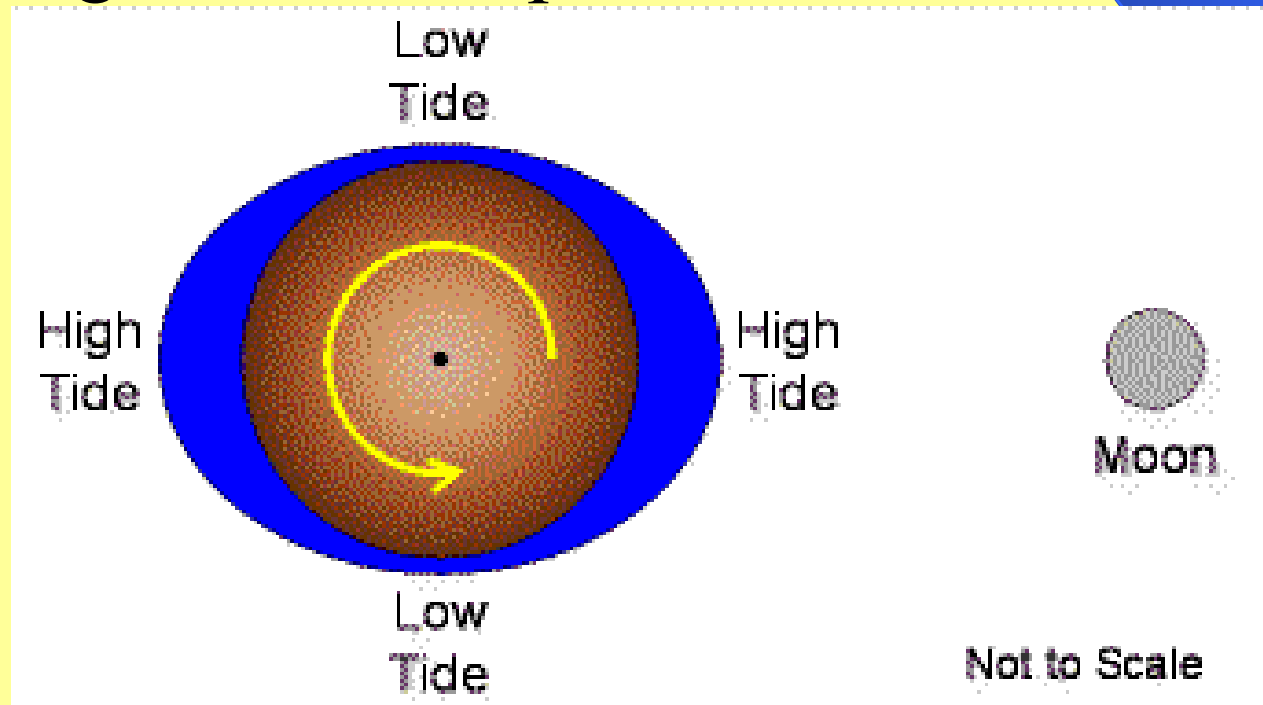
# High Tide

- Outward bulge of water.
  - Side of earth facing moon and the exact opposite side
- Occurs twice per day
  - As we rotate into the moon's gravitational pull!



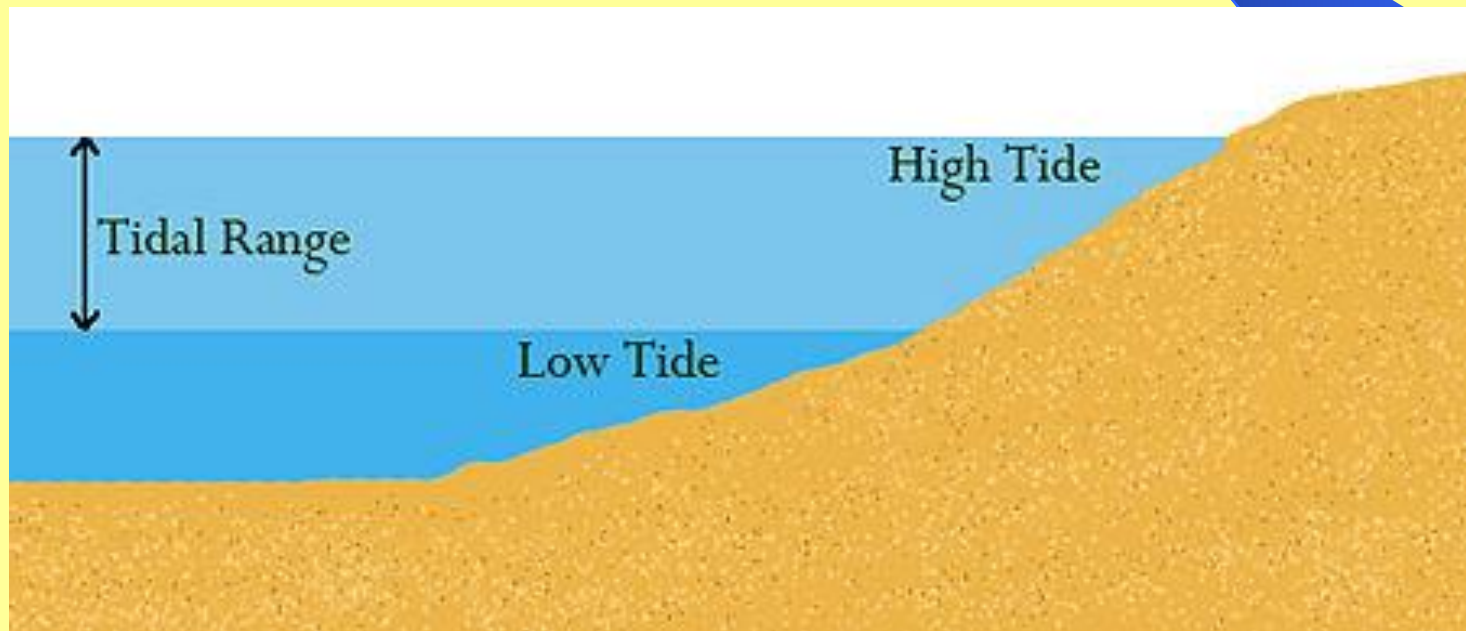
# Low Tide

- Trough left by the movement of water to the two bulges.
- Occurs twice per day as we move OUT OF the moon's gravitational pull!



# TIDAL RANGE

- The difference between the highest and lowest tides on any given day





# TIDAL RANGE

in

“Real Life”



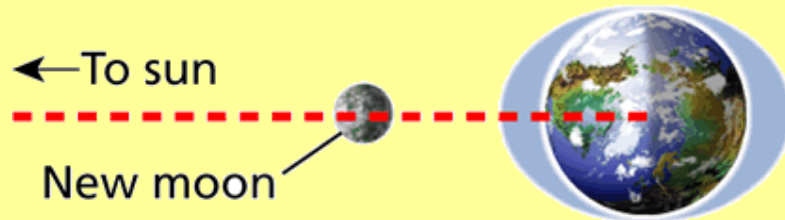
# Animation of High and Low Tides

- <http://www.wissen.swr.de/warum/gezeiten/themenseiten/t2/s1.html>

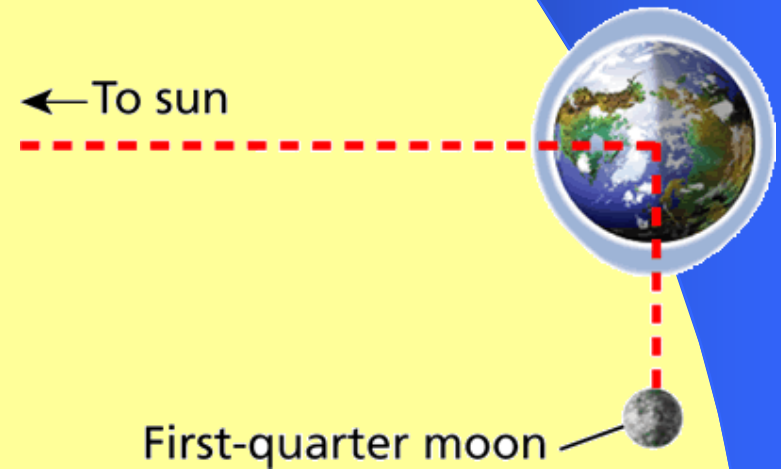
# Spring and Neap Tides

- When Earth, the sun, and the moon are in a straight line, a spring tide occurs. When the moon is at a right angle to the sun, a neap tide occurs.

**Spring Tide** Greatest difference between low and high tides



**Neap Tide** Smallest difference between low and high tides

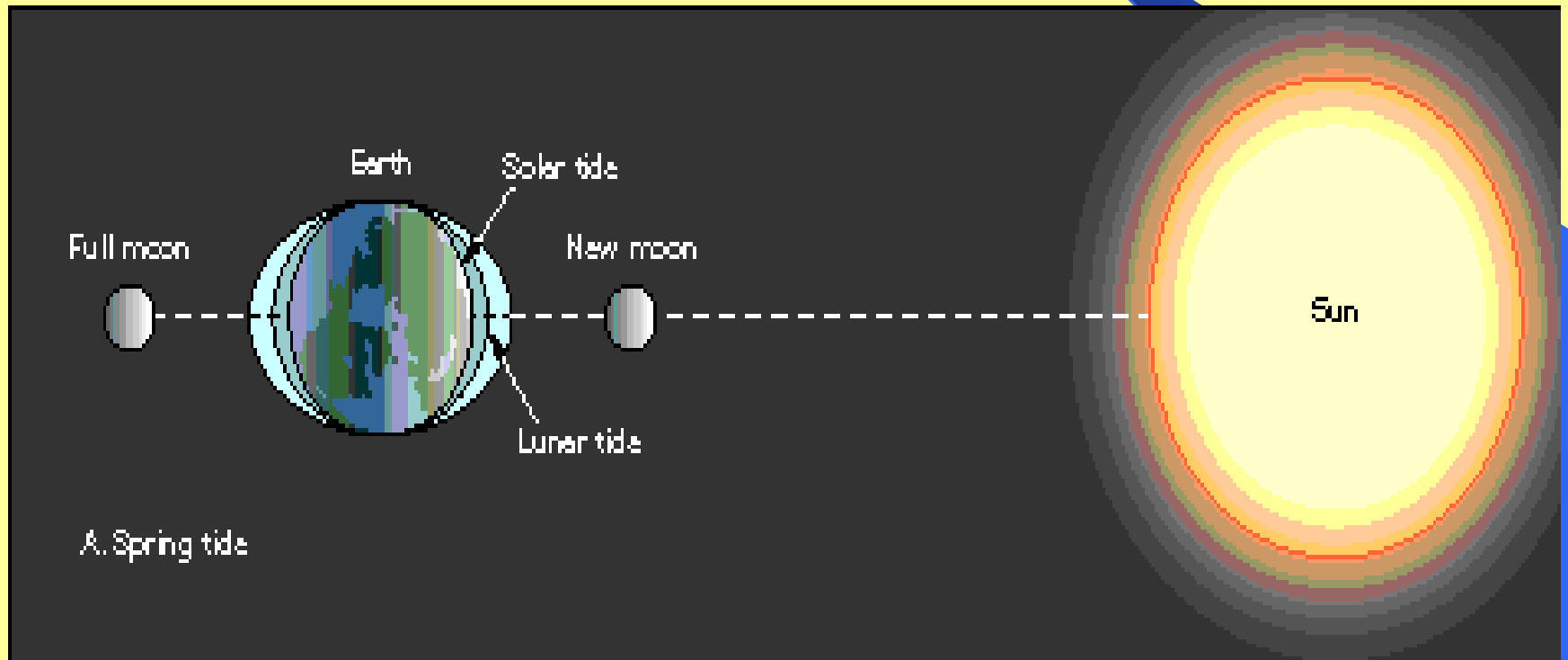


# Spring Tide

- Full or new moon causes the gravity of sun and moon to combine causing extreme high and low tides
- Large difference between high and low tides

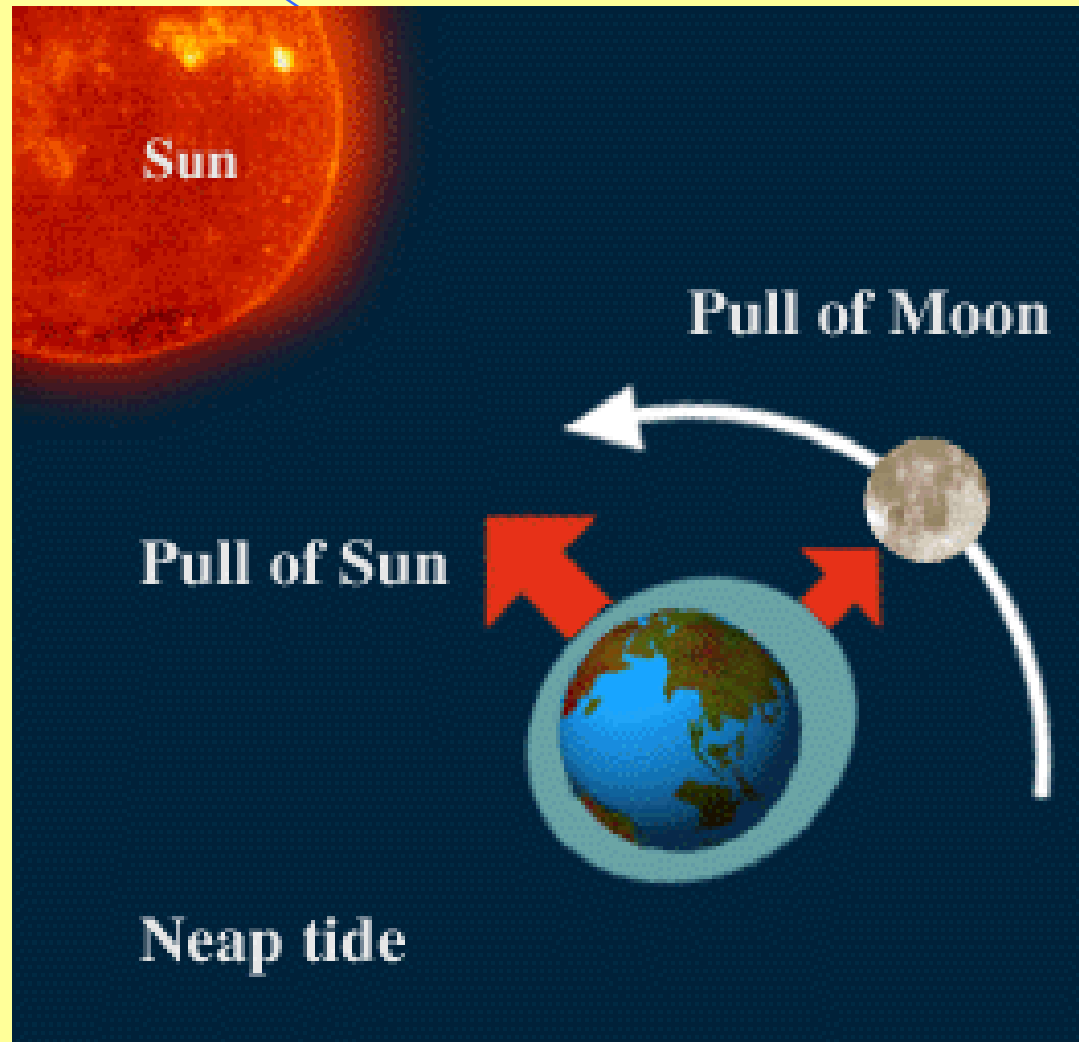


# What would the tidal range be like during a SPRING TIDE?

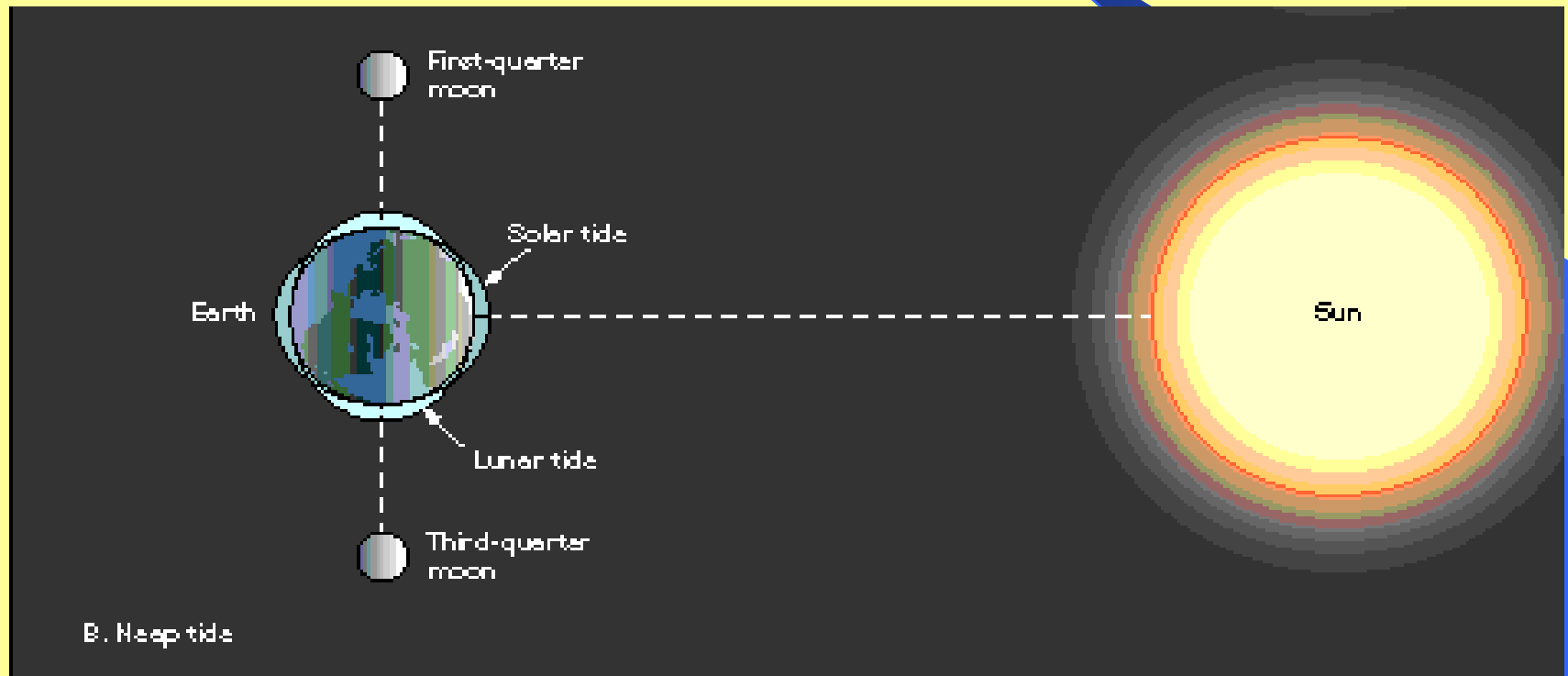


# Neap tide

- Moon is in Quarter phase causing the gravity of the sun and moon to cancel each other. (Sun and moon pull at a right angle)
- Smaller difference between high and low tides



# What would the tidal range be like during a SPRING TIDE?



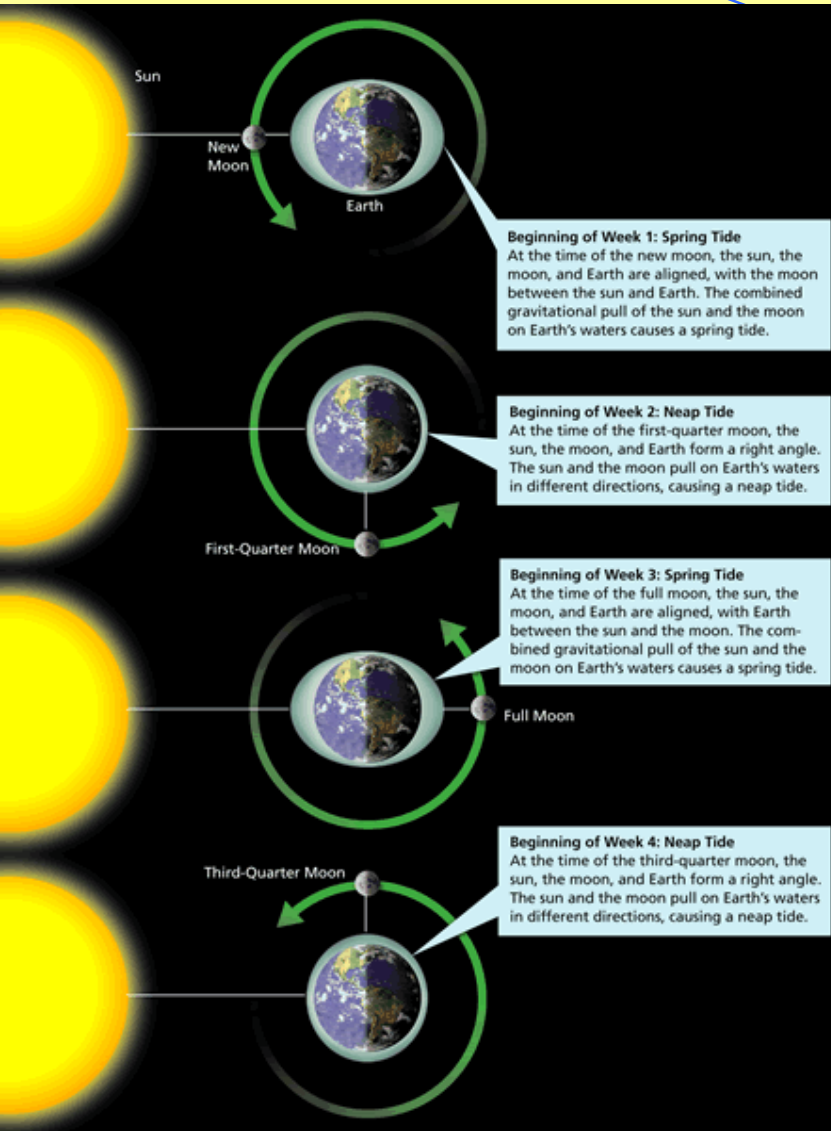
# Animation of Spring and Neap Tides

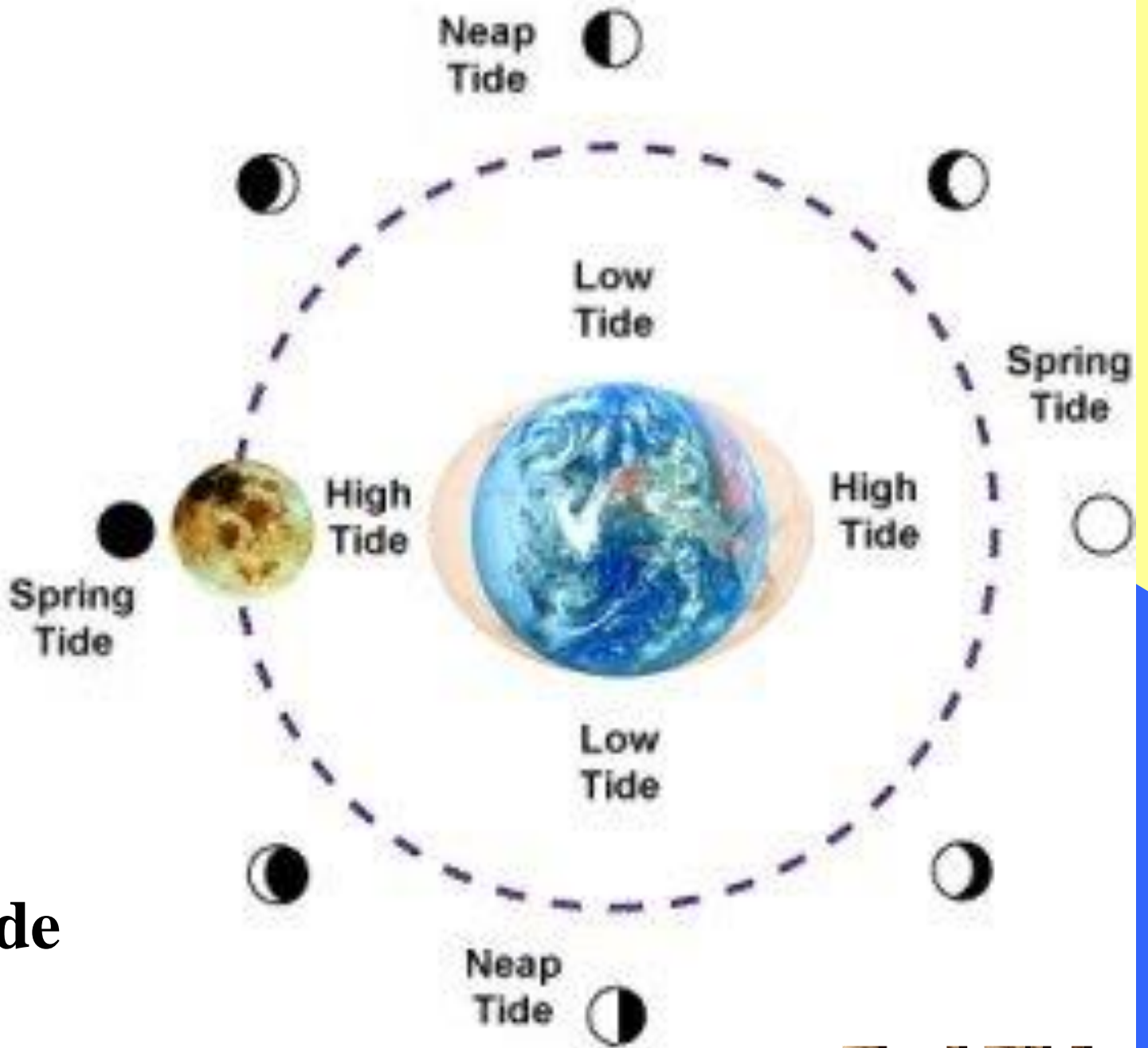
- <http://www.sfgate.com/getoutside/1996/jun/tides.html/>



# What Causes Tides?

- Spring tides and neap tides are caused by the positions of Earth, the sun, and the moon.





# The Tide Cycle

End Tides