Astronomy

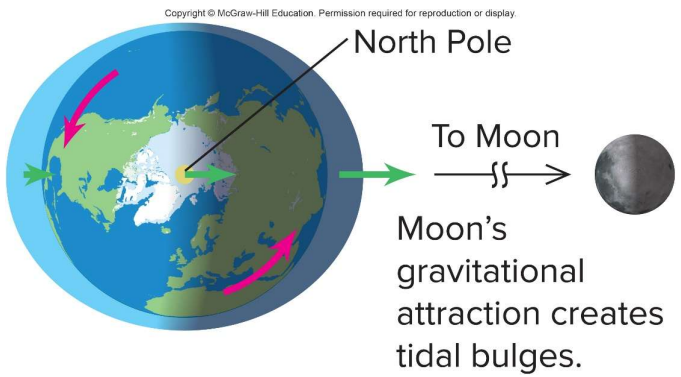
Weeks 16 – 18
Fall 2026

Tuesday, December 1st

- **TEK — Astronomy 7(B):** Model the scale, size, and distances of the Sun, Earth, and Moon system and identify the limitations of physical models.
- **Objective:** Students will explain how differential gravitational forces produce tides on Earth and demonstrate how the relative positions of the Sun, Earth, and Moon influence spring and neap tides.
- **Demonstration of Learning:** Students will construct and interpret Earth–Moon–Sun models to identify tidal bulges, predict spring and neap tides, and explain the relationship between lunar motion and tidal patterns.

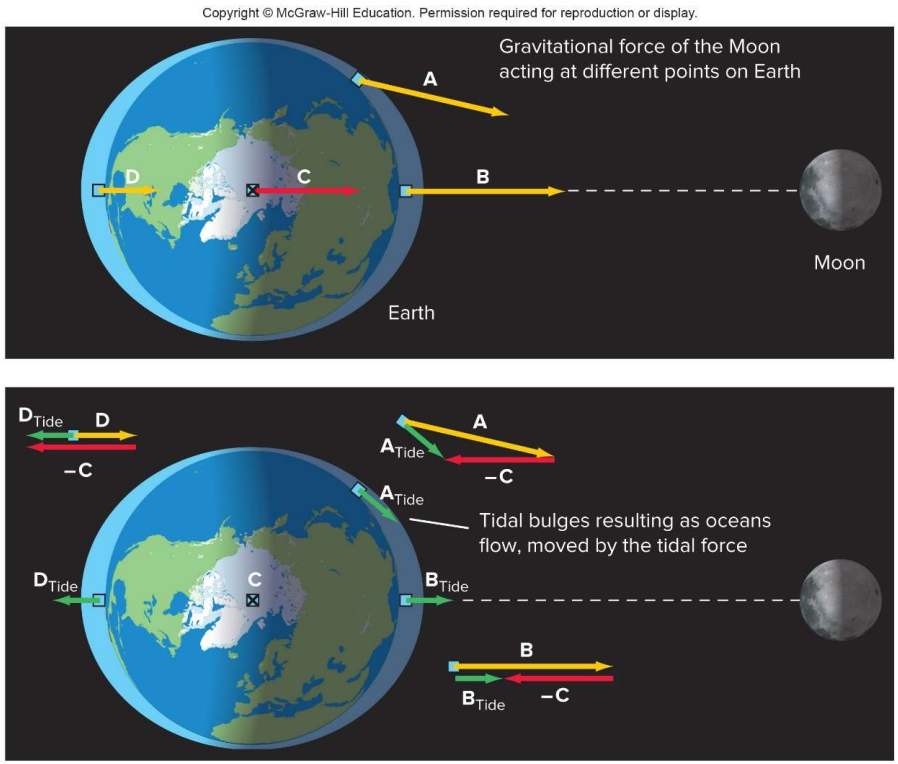
Differential Gravitational Force

- Remember that gravity depends on distance, so the Moon exerts a stronger gravitational force on the side of Earth closest to the Moon, and a weaker force on the far side.
- This difference in force from one side of an object to the other is called a ***differential gravitational force.***



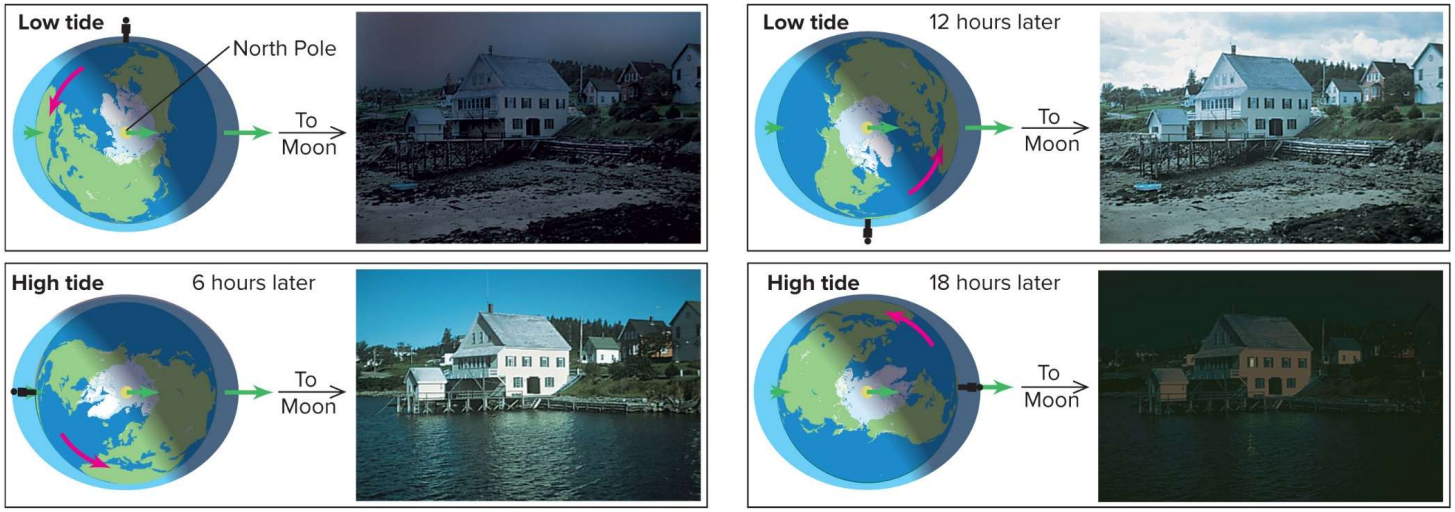
Tides

- This differential force draws water in the ocean into a ***tidal bulge*** on the sides facing and opposite the Moon.



High and Low Tides

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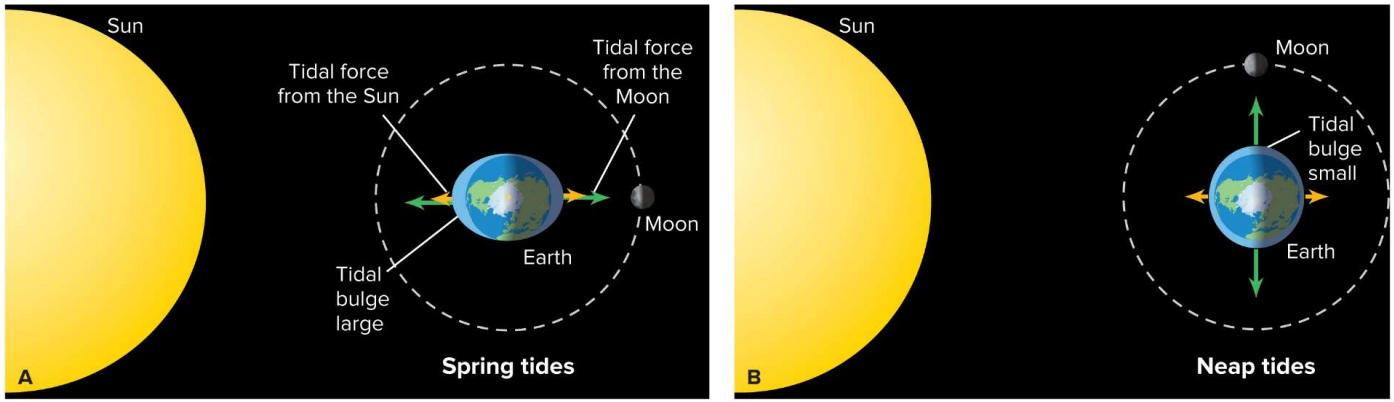


- Earth's rotation leads to two high/low tides per day.

- Courtesy of Tom Arny

Solar Contributions to Tides

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- The sun's tidal force is about one-half as big as the Moon's.
- When the Sun and Moon line up (new and full Moon), abnormally large ***spring tides*** occur.
- With the Moon at first or third quarter, the so-called ***neap tides*** occur, with tides not as extreme as normal tides.

Thursday, December 3rd

- Project Day 1
- **TEK — Astronomy 7(B):** Model the scale, size, and distances of the Sun, Earth, and Moon system and identify the limitations of physical models.
- **Objective:** Students will research lunar environments, evaluate possible locations for a scientific research station, and develop a preliminary mission design supported by scientific evidence.
- **Demonstration of Learning:** Students will submit a mission planning checkpoint containing a selected lunar site, scientific objectives, environmental challenges, a preliminary station sketch, and a prioritized materials wish list.

Tuesday, December 8th

- **TEK — Astronomy 7(B):** Model the scale, size, and distances of the Sun, Earth, and Moon system and identify the limitations of physical models.
- **Objective:** Students will apply their research on lunar conditions to finalize a scientifically appropriate station design and begin constructing a physical model.
- **Demonstration of Learning:** Students will submit a revised, labeled station design and demonstrate measurable construction progress that incorporates lunar terrain, habitats, transportation, power systems, and scientific facilities.

Thursday, December 10th

- **TEK — Astronomy 7(B):** Model the scale, size, and distances of the Sun, Earth, and Moon system and identify the limitations of physical models.
- **Objective:** Students will continue constructing their lunar exploration station and explain how its features address the geological and environmental conditions of the Moon.
- **Demonstration of Learning:** Students will demonstrate construction progress, provide scientific explanations for at least five model features, and identify two limitations of their physical model.

Friday, December 11th

- **TEK — Astronomy 7(B):** Model the scale, size, and distances of the Sun, Earth, and Moon system and identify the limitations of physical models.
- **Objective:** Students will complete and evaluate their lunar exploration station models and prepare scientific explanations defending their mission designs.
- **Demonstration of Learning:** Students will submit a completed, labeled physical model and a final written mission proposal demonstrating scientific accuracy, appropriate engineering decisions, and recognition of model limitations.

Tuesday, December 15th

- **TEK — Astronomy 7(B):** Model the scale, size, and distances of the Sun, Earth, and Moon system and identify the limitations of physical models.
- **Objective:** Students will communicate and defend their lunar exploration station designs using scientific evidence and demonstrate an understanding of the Moon's geological and environmental conditions.
- **Demonstration of Learning:** Students will present their completed physical models and independently answer questions explaining their site selection, scientific objectives, design decisions, and model limitations.

Wednesday, December 16th (C-day)

- Review for Semester Exam

Thursday, December 17th (Half-day)

- Semester Exam