Astronomy

Fall 2025

Weeks 13 - 14

Monday / Tuesday (November 3 – 4)

- Project parts 1

- T: **Science concepts. The student uses models to explain the formation, development, organization, and significance of solar system bodies. The student is expected to:**

1D compare the factors essential to life on Earth such as temperature, water, gases, and gravitational and magnetic fields to conditions on other planets and their satellites.

(16) Science concepts. The student understands the benefits and challenges of expanding our knowledge of the universe. The student is expected to:

16C evaluate the evidence of the existence of habitable zones and potentially habitable planetary bodies in extrasolar planetary systems;

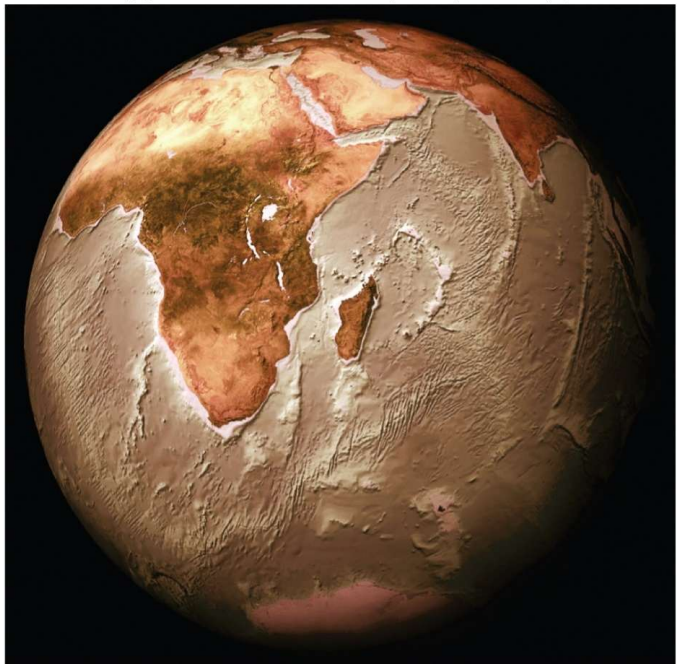
- O: I will be able to understand seismic readings
- D: by discussing the composition of Earth and beginning my Earth Project
- A: waves, crust, mantle, earthquake
- Y: How many layers does Earth have?

Earth

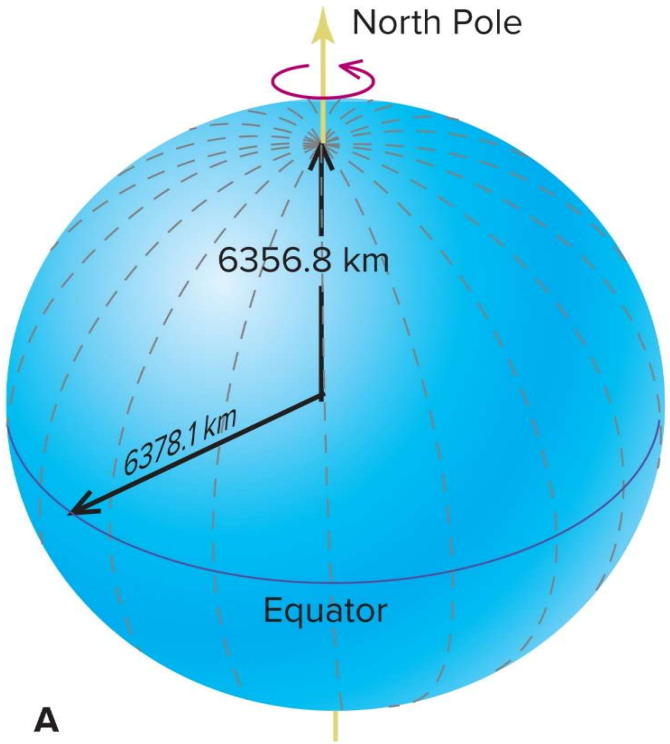
- NASA

Size and Shape of Earth

- In simple terms, Earth is a huge, rocky sphere spinning in space and moving around the Sun at a speed of about 100 miles every few seconds.
- Earth also has a blanket of air and a magnetic field that protects the surface from the hazards of interplanetary space.



Earth's Equatorial Bulge



- Earth is large enough for gravity to have shaped it into a sphere.
- More precisely, Earth's spin makes its equator bulge into a shape referred to as an oblate spheroid – a result of inertia.

Composition of Earth

- The most common elements of Earth's surface rocks are:
- Oxygen (45.5% by mass),
- Silicon (27.2%),
- Aluminum (8.3%),
- Iron (6.2%),
- Calcium (4.66%), and.
- Magnesium (2.76%).
- Silicon and oxygen usually occur together as ***silicates.***
- Ordinary sand is the silicate mineral quartz and is nearly pure silicon dioxide.

Density of Earth

- ***Density*** is a measure of how much material (mass) is packed into a given volume.
- Typical unit of density is grams per cubic centimeter.
- Water has a density of $1\text{g}/\text{cm}^3$, • ordinary <u>surface</u> rocks are $3\text{g}/\text{cm}^3$,
  - while iron is $8\text{g}/\text{cm}^3$.
- For a spherical object of mass *M* and radius *R*, its <u>average density</u> is given by

$$\rho = \frac{M}{\frac{4}{3}\pi R^3}$$

- For Earth, this density is found to be $5.5\text{g}/\text{cm}^3$.
- Consequently, Earth's interior (core) probably is iron (which is abundant in nature and high in density)

Wednesday / Thursday (November 5 & 6)

- Project Part 2

Journal 3.1

- What is your favorite season and why?

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- O: I will continue my understanding of the Earth and how life is possible
- D: by conducting a gallery walk of Part 1 and completing Part 3 of the project.
- A: Earth, atmosphere, layers, core
- Y: What are the essential requirements for life on a planet?

Friday (November 7)

- C-Day

Monday - Thursday (November 10 - 13)

- Parts 4 and 5

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16C evaluate the evidence of the existence of habitable zones and potentially habitable planetary bodies in extrasolar planetary systems;

- O: I will finalize my project over 2 class periods by
- D: completing parts 4 and 5.
- A: Earth, atmosphere
- Y: What factors are essential in a planet to ensure the possibility of life on that planet?

Friday (November 14)

- C-day

Monday / Tuesday (November 17 & 18)

- Presentations

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16C evaluate the evidence of the existence of habitable zones and potentially habitable planetary bodies in extrasolar planetary systems;

- O: I will demonstrate my understanding of the Earth as a vessel for life
- D: completing presenting and watching other students present their projects.

Wednesday / Thursday (November 19 – 20)

- Substitute on 11/20
- Modern Marvels video with questions

Friday: C-day

- Substitute – work on missing assignments or work on updating your Virtual Notebook