

Scientific Method (Reader 29)

1. What are the steps of the Scientific Method?
2. What is meant by the word **theory** in science?
3. What is **Occam's razor**?
4. What are Newton's four rules of science?

The Seasons (Astropedia Ch. 2: Seasons; Reader 12 & 15, Lecture-Tutorial, "Seasons", "Path of the Sun")

1. Explain why it is incorrect to believe it is hot in summer because the Earth is closer to the Sun in summer.
2. What form of the Sun's energy does the most heating of the Earth?
3. Use the Crocodile Principle to explain why it is warmer in summer than in winter.
4. Explain why it is always hot in the tropics and always cold in the polar regions.
5. Explain why the seasons are opposite in the Southern Hemisphere.
6. When are the longest and shortest days of the year in the Northern Hemisphere?
7. Discuss how the directions of sunrise and sunset vary over the course of the year.

Planets Origin/ Terrestrial Planets (Astropedia Ch.9 & Ch. 6 "Comparative Planetology" thru "Internal Heat and Geological Activity"; Reader 31, 33; L-T "Temperature & Formation of Planets")

1. Define solar nebula. Describe the Solar Nebula Theory.
2. Distinguish gas giant, ice giant, and Terrestrial planets in terms of composition and size. Explain how the solar nebula theory accounts for these differences.
3. Diagram the internal structure of a terrestrial planet.
4. Explain the mechanisms by which planetary interiors get hot and how they cool down.
5. Describe the 4 processes that shape a planet's surface.
6. Compare the three methods for dating a planet's surface.

Moon (Astropedia Ch. 5 Moon sections; L-T "Cause of Moon Phases")

1. Discuss the surface processes that are most important on the Moon and give examples of each.
2. Describe the internal structure of the Moon. Compare its size (diameter) with Earth.
3. Explain the effect of the Moon's small size on its atmosphere and volcanic activity.
4. Explain how **synchronous rotation** means there is a near side, and a far side.
Explain why it is a fallacy that the Moon has a "dark side."
5. Contrast the maria with the highlands. Compare the near side with the far side of Moon.
6. Compare the theories of the origin of the Moon. Which theory is accepted today? Why?
7. Compare the orbital period, rotation period, and solar day (noon to noon) on the Moon.
8. Name the eight phases of the Moon in order. What time of day does the full moon rise?

Mercury; the Tidal Force (Astropedia Ch. 6: Mercury sections; Reader 48)

1. Compare the theories that account for Mercury's large iron core.
2. Compare Mercury's surface with the Moon's surface. Compare Mercury's internal composition with the Moon's.
3. Compare the length of day with the length of the year on Mercury.
4. Explain how scarps were formed on Mercury.
5. Discuss the effect of the tidal force on planets and moons.