ConcepTest

- Northerners have cold days in January because
  a) the Earth is farthest from the Sun in January.
  b) the orbital velocity of the Earth is largest in January.
  c) the Sun is lower in the sky in January.
  d) El Nino is always strong in January.

ConcepTest

- Suppose you are visiting Australia in August. Which of the following is true? It is
  a) winter and the Sun rises in the northeast.
  b) summer and the Sun rises in the northeast.
  c) winter and the Sun rises in the southeast.
  d) summer and the Sun rises in the southeast.

ConcepTest

- Imagine a planet whose rotation axis is perpendicular to its orbital plane. How would you describe its seasons?
  a) greater temperature variations than on Earth.
  b) less temperature variations than on Earth.
  c) constant.
  d) the same as those on Earth.

Phases of the Moon
Phases of the Moon

- Moon’s orbit is tilted 5 degrees relative to the Earth’s orbit around the sun.
- Therefore, Moon, Earth & Sun are not always in the same plane.
- Eclipse occurs when E-M-S are in line (New or Full moon) and at a node.

Lunar Eclipse
- Moon in Earth’s shadow
  - umbra - part of shadow where sunlight is completely blocked
  - penumbral - part of shadow where sunlight is partially blocked
- Full moon phase

Solar Eclipse
- Earth is in Moon’s shadow
- New Moon phase
  - when new moon occurs at a node
Solar Eclipse Cycle

- Eclipses recur in a cycle of 18 years, 11.3 days
  - called Saros Cycle
  - many ancient cultures figured this out!
- Eclipse in next cycle will be in different part of world, and type of eclipse may be different
  - no ancient cultures got this part

ConcepTest

- The phase of the Moon at a lunar eclipse
  a) is always full.
  b) is always new.
  c) is always waning crescent.
  d) is always waxing gibbous.
  e) may be anything depending on the geometry.