

## Interviews: Astronomy Questions Scoring Key (21 points)

Scores:

- 0 - "I don't know" or response is off-topic, or student is absent
- 1 - answers prompt but answer is unclear or generally incorrect
- 2 - answers prompt with one or more key ideas indicated by black bullets, but does not go into reasoning why it is the case (i.e. makes the tides bigger or smaller).
- 3 - answers prompt with examples and provides reasoning why it is the case or what would happen - inference (at least one use of white bullets).

**Q1: Can you tell me about the Moon? How does it affect us here on Earth?**

- Tides
  - Result of gravitational pull of moon
  - High tide on side facing moon and opposite side
  - Two high tides and low tides at all times as Earth spins
  - Pulls moon forward, giving moon energy, causes moon to spiral away
- Earth loses energy it gives to moon by slowing down
  - Days are getting longer
  - Reduced wind speed
  - This allows humans and nature to grow upwards
- Light at night for nocturnal animals

**Q2 TRANSFER: What do you think Earth would be like if the Moon were twice as large as it is now?**

- Gravitational force of moon on Earth stronger.
- Tides higher
  - Threatening to coastal cities
- Rotation slowed even more

- Days and nights longer
- Brighter nights
  - Less stars visible

**Q3: Can you tell me what the Earth's axis of rotation is? Why is it important?**

- Line from North Pole to South Pole that Earth rotates around
- 23.5 degree tilt
- Results in seasons
  - Seasons are not proximity but amount of light hitting Earth's surface and for how long
  - Summer sees more concentrated sunlight for longer times
  - More concentrated light provides more heat
- Results in day and night
  - If tilted more parts of earth would not see sun for up to six months at a time

**Q4: TRANSFER: What Earth you think Earth would be like if it didn't rotate?**

- Every place on earth would have months of only darkness and months of only light
  - Habitability would be difficult on dark side.

**Q5: What do you think would happen if the Earth was closer to the sun, like Venus? Why would we not be able to survive?**

- We are at a distance where temperatures are not extreme
  - If closer, temperatures would be unbearable for life
- We are at a distance where liquid does not evaporate
  - If closer, oceans would evaporate because of heat

**Q6: What does an Astronomer do?**

- Use physics and math to study stars, planets, moons, galaxies, black holes, comets, and other phenomena outside Earth.

- Study motion of these objects
- Sometimes find new planets and other objects in space.
- They make observations and use math to explain them.
- They collect data using telescopes
  - They test hypotheses and analyze data to determine whether or not hypothesis was correct, needs further testing, or needs to be discarded.

**Q7: What are the "must have's" you'll need to survive on the moon?**

- Shelter from radiation
- Dirt, seeds, water for farming
- Source for electricity
- Oxygen supply
- Suit and helmet
- Air pressure
- Regulated temperature
- Communication
- Transportation
- Medical supplies
- Other people
- Entertainment

Habitability Score (23 points)

- A habitable zone is a region of Earth, or any celestial body, that has conditions suitable for maintaining life. Necessities of such conditions are:
  - Water
  - Oxygen

- Pressure
- Gravity
- Land
- Temperate climate (temperature is not too extreme)
- Light