**Astronomy Assessment and TPS Questions:**

**Temperature and Formation of Our Solar System**

1. The standard model of solar system formation offers what explanation for the different compositions of the terrestrial and Jovian planets?
   1. During condensation, the heavier elements tended to sink nearer the Sun and, being rare, only provided enough material to build the relatively small terrestrial planets.
   2. During the collapse of the gaseous nebula, most of the material tended to collect far from the Sun because of the large centrifugal forces, which provided the necessary material to build the large Jovian planets.
   3. The large gravitational forces of Jupiter tended to prevent planet formation in the inner solar system and eventually attracted most of the material into the region of the Jovian planets.
   4. The terrestrial planets were formed near the Sun where, because of the high temperatures, only heavier elements were able to condense.
2. Which of the following planets initially formed closest to the Sun at a location with a temperature below the freezing point of water?
   1. Mercury
   2. Venus
   3. Earth
   4. Mars
   5. Jupiter
3. Which one of the planets listed initially formed at the outermost location where the temperature was high enough for water to boil?
   1. Earth
   2. Mars
   3. Jupiter
   4. Saturn
   5. Neptune
4. Which one of the planets listed below initially formed at the outermost location where the temperature was high enough for water to be a liquid?
   1. Earth
   2. Mars
   3. Jupiter
   4. Saturn
   5. Neptune
5. How many planets (not including Pluto) formed at locations in the early solar nebula at temperatures cooler than your body temperature?
6. Only one
7. Two planets
8. Three planets
9. Four planets
10. More than four planets
11. Which type of planet would have formed in the early solar nebula at temperatures above the boiling point of water?
    1. rocky, terrestrial planets
    2. gas giant, Jovian planets
12. Which of the following is the correct ranking for the temperature (from coolest to hottest) in the solar system where each of the planets initially formed?
13. Mercury, Venus, Earth, Mars, Jupiter, Saturn, Neptune, Uranus
14. Uranus, Neptune, Saturn, Jupiter, Mars, Earth, Venus, Mercury
15. Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus, Neptune
16. Neptune, Uranus, Saturn, Jupiter, Mars, Earth, Venus, Mercury
17. None of the above are correct
18. Astronomers have discovered massive gas giant planets like Jupiter orbiting their companion stars at closer than 0.7 AU (about the distance of Venus’s orbit). Why *don’t* astronomers believe that these gas giant planets originally formed at these locations?
19. The planets’ gravity would have been too large to form that close to the star.
20. The temperature was too high at this distance from the star for gas giant planets to form.
21. Their orbital periods are too long for them to be located that close to their companion stars.
22. A young star’s solar wind would have blown the planets farther away.
23. A planet that formed above the boiling point of water is
    1. a Terrestrial planet.
    2. a Jovian planet.
    3. No planet forms above the boiling point of water.
24. Jovian planets formed \_\_\_\_\_\_\_ and Terrestrial planets formed \_\_\_\_\_\_\_
    1. above the boiling point of water; below the boiling point of water.
    2. below the boiling point of water; above the boiling point of water.
    3. closer than 2 AU from the Sun; further than 2 AU from the Sun.
25. A large Jovian planet would not have formed at the location of
    1. Neptune.
    2. Saturn.
    3. Venus.
26. What Planet formed closest to the Sun?
    1. Mercury
    2. Jupiter
    3. Venus
    4. Mars
27. Which of the following is a Jovian planet?
    1. Venus
    2. Earth
    3. Neptune
    4. Mars
28. What is the order of the planets from closest to the Sun to farthest from the Sun?
    1. Venus Mercury Earth Mars Jupiter Saturn Uranus Neptune
    2. Mercury Venus Earth Mars Jupiter Saturn Uranus Neptune
    3. Mercury Venus Mars Earth Jupiter Saturn Neptune Uranus
    4. Venus Mercury Mars Earth Jupiter Saturn Neptune Uranus
29. Which of the following is the correct ranking for the temperature in the solar system where each of the planets initially formed, from hottest temperature to coolest temperature?
    1. Mercury, Venus, Earth, Mars, Jupiter, Saturn, Neptune, Uranus
    2. Uranus, Neptune, Saturn, Jupiter, Mars, Earth, Venus, Mercury
    3. Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus, Neptune
    4. Neptune, Uranus, Saturn, Jupiter, Mars, Earth, Venus, Mercury
    5. None of the above are correct
30. What Planet formed farthest from the Sun, at a location where the temperature was above the boiling point of water?
    1. Mercury
    2. Earth
    3. Venus
    4. Mars
    5. Jupiter
31. Which Planet formed farthest from the Sun, at a location where the temperature was below the freezing point of water?
    1. Uranus
    2. Saturn
    3. Jupiter
    4. Mars
    5. Neptune
32. Which Jovian planet formed at a temperature closest to the boiling point of water?
    1. Neptune
    2. Uranus
    3. Saturn
    4. Jupiter
33. Which of the following is not a characteristic of a Jovian planet in our solar system?
    1. They are formed from gas
    2. They formed at temperatures colder than the boiling point of water
    3. They are all located father than 2 AU away from the Sun
    4. All of the above are characteristics of Jovian planets
34. Which of the following groups of planets all formed above the boiling point of water?
    1. Jupiter, Mars, Saturn, Neptune
    2. Mars, Earth, Venus, Mercury
    3. Jupiter, Saturn, Uranus, Neptune
    4. Jupiter, Venus, Saturn, Mercury
35. During the formation of the solar system, it was too \_\_\_\_\_\_\_\_ for water to be a solid \_\_\_\_\_\_\_\_.
    1. cold, closer than 2 AU to the Sun
    2. cold, farther than 2 AU from the Sun
    3. hot, closer than 2 AU to the Sun
    4. hot, farther than 2 AU from the Sun
36. During the formation of the solar system, it was \_\_\_\_\_\_\_ enough \_\_\_\_\_\_ the Sun for light gasses to condense.
    1. hot, closer than 2 AU to
    2. hot, farther from 2 AU from
    3. cold, closer than 2 AU from
    4. cold, farther than 2 AU from
37. During the formation of the solar system, the border between where the terrestrial planets formed and where the Jovian planets formed was associated with:
    1. the placement of Earth’s orbit
    2. the boiling point of water
    3. a rift in space-time
    4. the boiling point of methane
38. At which of the following distances from the Sun would a Jovian planet not have been able to form?
    1. 45 AU
    2. 33 AU
    3. 6 AU
    4. 5 AU
    5. None of the above