

1. The color in the visible spectrum with the shortest wavelength is blue or violet.
2. The following statements are true about electromagnetic (EM) waves a, b
 - a) EM waves can travel through a vacuum
 - b) In a vacuum all EM waves travel at the speed of light (186,000 miles/sec)
 - c) Our atmosphere transmits all EM waves equally well
 - d) Our atmosphere blocks all EM waves
3. The number of waves that travel past a given point in one second is called the b
 - a) wavelength
 - b) frequency
 - c) speed
 - d) amplitude
 - e) none of these
4. The two types of telescopes are called reflectors and refractors.
5. All large telescopes used for visible light are reflectors. Given one reason why.
Mirrors can be supported from behind; can be light-weighted; reflectors can have folded optical paths; no chromatic aberration
6. The “size” of a telescope refers to b
 - a) The length of the tube holding the optics
 - b) The diameter of the primary mirror
 - c) The diameter of the secondary mirror
 - d) The diameter of the telescope dome
7. The light collecting capability of a telescope depends on the area of the primary mirror. If the diameter of the primary mirror becomes three times larger, the light collecting capability will increase how many times? 9 (hint: the area of a circle is πr^2)
8. Given one reason why we put telescopes in space.
Detect all EM waves; improve resolution
9. Zero degrees on the Kelvin temperature scale corresponds to c
 - a) water freezes
 - b) water boils
 - c) temperature at which molecular motion stops
 - d) the zero point has no physical meaning
10. Room temperature on the Kelvin temperature scale is approximately c
 - a) 50 K
 - b) 100 K
 - c) 300 K
 - d) 1000 K
 - e) 5780 K
11. The Sun is mainly composed of the element a
 - a) hydrogen
 - b) helium
 - c) oxygen
 - d) carbon dioxide
12. The age of the Sun is approximately d years.

a) 1 million b) 5 million c) 1 billion d) 5 billion 10 billion

13. The outward pressure of the hot gases in the Sun are balanced by the force of **gravity**

14. The Sun creates energy through the process of nuclear fusion. This takes place in what region of the Sun? **core**

15. During the process of nuclear fusion, what element (i.e., type of atom) is consumed? **hydrogen**

16. The region of the Sun that we observe is called the **photosphere**.

17. Give one characteristic of the planets in the solar system that supports the theory that they formed from a disk of gas and dust surrounding the young Sun.

The planets all revolve around the Sun in the same direction; the orbits of the planets are all approximately in a plane

18. Give two characteristics that distinguish the terrestrial and jovian planets (do not use their distance from the Sun as one of the characteristics)

Composition, rings, moons, size, density, magnetic fields, etc.

19. What substance played a key role in the formation of the jovian planets because it is a solid at the temperatures found in the outer solar system? **water ice**

20. Explain the concept of differentiation as it applies to planet formation.

When the planets were young they were hot (molten) and had uniform composition. As they cooled, the denser material (iron and nickel) move to the center of the planet (core) and the less dense material (silicates) “floated” above the core forming the mantle and crust. This separation of material by density is called differentiation

21. The Earth’s moon and the planet Mercury are similar in what regard?

Neither has an atmosphere

22. The surface of Venus is the hottest place in the solar system (outside the Sun) because the atmospheric gas **carbon dioxide** does not readily allow heat to escape through the atmosphere. (hint: this is the greenhouse effect)

23. Name two ways that surface features on Earth are altered.

Wind, water, volcanoes, earthquakes (plate tectonics), human activity, impact by meteorites, asteroids, and comets

24. Which of the following statements about Mars are true? **a, c, d**

- a) There is evidence of the existence of surface liquid water in the past
- b) There is evidence of the existence of life in the past
- c) Rocks from Mars can end up at Earth by natural processes
- d) Mars has polar caps similar in appearance to those on Earth
- e) Mars has a very thin atmosphere of oxygen

25. Jupiter's Great Red Spot is a feature that has been observed for over 300 years. What is this feature?

The Great Red Spot is a cyclonic storm in Jupiter's atmosphere

26. Which of the Galilean moons is thought to contain a salty, liquid ocean under a thick layer of ice? **__Europa__**

27. Which of the following statements about the rings of Saturn are true? **_b, d, e_**

- a) They are very similar to the rings of the other jovian planets
- b) They are extremely thin and can disappear when viewed edge on
- c) They consist of a solid sheet of material
- d) They contain noticeable gaps
- e) Some of Saturn's moon help to maintain the structure of the rings

28. In a few weeks the Cassini spacecraft will launch a probe into Saturn's large moon **_Titan_**.

29. Which of the following statements about Uranus are true? **___b___**

- a) Uranus is too faint to be seen with the naked eye
- b) Uranus was discovered by accident
- c) There are no seasons on Uranus
- d) For some unknown reason, Uranus does not obey Newton's laws

30. Which of the following statements about Neptune are true? **__b, c, d_**

- a) It was discovered by accident
- b) Its existence was predicted based on Newton's laws of motion and gravity
- c) At times it is the most distance planet from the Sun
- d) Neptune has a large moon called Triton

31. Give two reasons why Pluto is not like the jovian planets.

No rings, no atmosphere of hydrogen and helium, small size, number of moons

32. Which of the following statements about Pluto are true? **___a___**

- a) Pluto was discovered by accident
- b) Pluto's discovery was a triumph for Newtonian physics
- c) Pluto's moon was discovered by the Voyager spacecraft
- d) It is now believed that Pluto is an escaped moon of Neptune

33. Which of the following statements about asteroids are true? **_a, d_**

- a) They are sometimes called minor planets
- b) Many of them are found in region between Saturn and Uranus
- c) No asteroid is larger than 100 meters in diameter
- d) Asteroids mainly contain rocky material

34. Which of the following statements about comets are true? a, c
- a) Comets travel in highly eccentric orbits
 - b) It is unknown if a comet has ever hit a planet in the solar system
 - c) Comets contain mostly frozen gases
 - d) Comets are best seen when they are far from the Sun in their orbits
35. Which of the following statements about meteoroids are true? b
- a) They are most made of ice
 - b) When they pass through the Earth's atmosphere they usually burn up causing a streak of light called a meteor
 - c) They have never been known to land on the surface of the Earth
 - d) They can be as large as 300 km in diameter
36. The following planets are currently very bright in the east just before sunrise. b, d
- a) Mercury
 - b) Venus
 - c) Mars
 - d) Jupiter
 - e) Uranus