**Astronomy Assessment and TPS Questions:**

**Telescopes and Earth’s Atmosphere**

1. Which, if any, of the different wavelengths of light listed below completely passes through Earth’s atmosphere and reaches the surface?
   1. gamma
   2. radio
   3. infrared
   4. X-rays
   5. All of the above.
2. Which, if any, of the different wavelengths of light listed below completely passes through Earth’s atmosphere and reaches the surface? *Choose (bubble in) all that apply*.
   1. gamma
   2. radio
   3. visible
   4. X-rays
   5. none of the above
3. Which type of telescope uses two glass lenses to collect and focus light?
   1. reflector
   2. refractor
   3. mirrored
   4. satellite
4. Imagine that you are the head of a funding agency that can afford to build only one telescope. Which of the four proposed telescopes below would be best to support?
   1. A gamma ray telescope in Antarctica
   2. A radio telescope in orbit above the Earth
   3. A visible telescope located high on a mountain in Peru
   4. An ultraviolet telescope located in the Mojave desert
5. Imagine that you are the head of a funding agency that can afford to build only one telescope. Which of the four proposed telescopes below would be best to support?
6. An Radio telescope in orbit above the Earth
7. A gamma ray telescope in orbit above the Earth
8. An x-ray telescope located on a mountain in Peru
9. An ultraviolet telescope located in the Mojave desert
10. Imagine that you are the head of a funding agency that can afford to build only one telescope. Which of the four proposed telescopes below would be best to support?
11. An ultraviolet telescope located in the Mojave desert
12. A Radio telescope located in the Australian Outback
13. A gamma ray telescope in orbit above the Earth
14. An x-ray telescope located on a mountain in Peru
15. Some telescopes are placed in space above Earth’s atmosphere primarily for which of the following reasons?
    1. Because the astmosphere magnifies objects making them look larger than they actually are.
    2. Some of the light being sent out from the telescopes can be blocked by Earth’s atmosphere.
    3. Moving the telescope above the atmosphere puts the telescope closer making the objects appear brighter.
    4. Some of the light from objects is absorbed by Earth’s atmosphere.
16. Which is the correct reasoning for why an x-ray telescope located in Antarctica that is to be used to look for evidence of black holes in the centers of galaxies would not get funded?
    1. There are no such things as black holes.
    2. x-rays are too energetic to detect with a telescope.
    3. You can’t build a telescope in Antarctica.
    4. x-rays don’t completely penetrate the Earth’s atmosphere.
17. Imagine that you are the head of a funding agency that can afford to build only one telescope. Which of the four proposed telescopes below would be best to support?
    1. An Infrared telescope in Antarctica
    2. A gamma ray telescope in orbit above the Earth
    3. An x-ray telescope located high on a mountain in Peru
    4. An ultraviolet telescope located in the Mojave desert
18. Imagine that you are the head of a funding agency that can afford to build only one telescope. Which of the four proposed telescopes below would be best to support?
    1. A gamma ray telescope in Antarctica
    2. A radio telescope in orbit above the Earth
    3. A visible telescope located high on a mountain in Peru
    4. An ultraviolet telescope located in the Mojave desert
19. How many of the following: gamma, x-ray, UV, Visible, IR and radio, coming from space can NOT be detected on the surface of Earth at all?
20. Only one
21. Two
22. Three
23. More than Three
24. None of the above
25. How many of the following: gamma, x-ray, UV, Visible, IR and radio, coming from space can pass through the atmosphere without being absorbed at all?
    1. Only one
    2. Two
    3. Three
    4. More than Three
    5. None of the above
26. Which one of the following telescopes would you use if you wanted to detect the greatest amount of radiation by charged particles spiraling around the magnetic field of a black hole?
    1. the infrared Spitzer Space Telescope
    2. the Very Large Array radio telescope
    3. the Chandra X-ray Observatory
    4. the GALEX ultraviolet telescope
27. Which is the correct reasoning for why a gamma ray telescope located in Antarctica that is to be used to look for evidence of black holes in the centers of galaxies would not get funded?
    1. There is no way to detect the presence of a black hole.
    2. Gamma rays are too energetic to detect with a telescope.
    3. You can’t build a functioning telescope in Antarctica.
    4. Gamma rays don’t penetrate Earth’s atmosphere.
28. What forms of light are completely absorbed by Earth’s atmosphere?
    1. Gamma Rays and Infrared
    2. X-rays and Ultraviolet
    3. Ultraviolet and Infrared
    4. Gamma Rays and Ultraviolet
    5. X-rays and Gamma Rays
29. The most important function of a telescope is
    1. to be able to see far away dim objects.
    2. to see fine detail in nearby objects like the moon.
    3. to magnify objects like Jupiter.
    4. more than one of the above.
30. Which of the following types of light cannot be observed with a telescope from Earth’s surface?
    1. Radio
    2. Infrared
    3. Visible
    4. X-ray
31. Your friend didn’t come to the party you were having during the weekend. When you confront him about it, he apologizes, saying that he had the rare chance to visit the new gamma ray telescope in town. Could he be telling the truth?
    1. Yes
    2. No, gamma ray telescopes must be on mountains
    3. No, gamma ray telescopes must be above Earth’s atmosphere
    4. No, the technology for a gamma ray telescope doesn’t exist yet
32. You have to choose between funding an ultraviolet telescope in Canada or an X-ray telescope orbiting Earth. Which project do you decide to fund? Why?
    1. the UV telescope because the X-ray telescope wouldn’t get enough light
    2. the X-ray telescope because the UV telescope wouldn’t get enough light
    3. Neither of the telescopes would get enough light
    4. They would both get enough light, so the UV telescope because it would be least expensive
33. Imagine you wanted to discover distant objects in our universe, but only had enough money to build one telescope. Which of the following would you build?
    1. An infrared wavelength telescope located on the summit of a mountain in the Sierra Nevadas
    2. An ultraviolet wavelength telescope, placed on a beach in southern California
    3. An X-ray wavelength telescope, in orbit around Earth
    4. A gamma ray wavelength telescope located in southern Canada
34. A telescope atop Mount Everest would be able to see which of the following forms of light?
35. gamma
36. radio
37. x-ray
38. more than one of the above
39. none of the above