

## The Universe. Season 3 Disc 1

### Light Speed

1. In one second, light can circle the Earth how many times?
2. What is the speed of light?
3. You would have to ride a bicycle how long at 12mph to go the distance light travels in one second?
4. Why was there a delay in communication with Neil Armstrong while he was on the moon/
5. It takes how long for light to reach Earth from the sun?
6. As you go further out from Earth it takes longer for signals to get to their destinations. It takes \_\_\_\_\_ for a signal to reach probes exploring Mars.
7. It takes \_\_\_\_\_ for signals to get to Saturn.
8. It takes \_\_\_\_\_ for signals to get to Voyager 1 which is now heading out of the solar system.
9. How far away is Proxima Centauri?
10. What is the distance that light actually can travel in one year?
11. Sirius is 8.6 light years away. Why do astronomers say we are seeing the history of Sirius when we look at it?
12. Vega is how far away?
13. Betelgeuse is how far away?
14. So when we look at stars we are actually “looking back in \_\_\_\_\_”.
15. Crab Nebula is \_\_\_\_\_ LY away.
16. Galactic core is \_\_\_\_\_ LY away.
17. Andromeda Galaxy is \_\_\_\_\_ LY away.
18. What is cosmic background radiation?
19. What we can see of the universe is limited by \_\_\_\_\_.
20. Describe what “red shift” is.
21. What did Edwin Hubble discover in 1926?
22. The faster the movement objects are moving away, the greater the \_\_\_\_\_.
23. How long ago is it believed that the universe began?
24. So, the farthest astronomers can see in any direction would be \_\_\_\_\_.
25. What is the “light horizon”?
26. Galaxies really far away are actually moving away faster than “\_\_\_\_\_”.
27. Some galaxies we will never see because they are actually moving faster than the speed of light. Explain why we can't see them.
28. What does it mean that light speed is a constant?
29. How does the speed of an object affect the speed of light coming away from it?
30. How many GPS satellites are circling the Earth?
31. These satellites are traveling at 7,000 mph. How does the speed of the satellite affect the clock on the satellite?
32. Describe some of the affects that would occur if we could travel at the speed of light.
33. Light travels 186, 000 mph in a vacuum. What happens to light as it enters other medium?
34. What is the “Giggle factor”?
35. What is a worm hole and how could one be created?