

Space Systems – Origin of the Universe

Name: _____

1. What is the universe?
2. What is a light-day? (Hint: What is a light-year?)
3. How many light-minutes away from Earth is the Sun? What does that mean?
4. Using the table on page 460, how many times longer does it take light from Polaris than light from Proxima Centauri to reach Earth?
5. The farther away an object is, _____.
6. How do scientists study what the universe was like long ago?
7. What was Hubble's evidence that the universe is expanding?
8. Describe the Doppler effect.
9. A star is moving toward Earth. Will its light be red-shifted, blue-shifted, or not shifted at all?

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10. What does Hubble's observation that galaxies are moving away from Earth suggest about the universe?

11. Explain the big bang theory?

12. Suppose Hubble's observations had shown that light from distant galaxies was blue-shifted. Would this observation provide clear evidence for the big bang theory? Explain your answer.

13. Describe two evidences or observations that support the big bang theory.

14. What do scientists think cosmic background radiation is?

15. What had to happen to the early universe before matter could form?

16. When did the first stars in the universe form?

17. What force could prevent the universe from expanding forever?

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18. What are three possible futures for the universe?
 - a.
 - b.
 - c.
19. Why does the amount of matter in the universe affect what its future will be?
20. Why can't scientists predict exactly what will happen in the future of the universe?
21. Why do scientist think there is a great deal of invisible matter in the universe?
22. Einstein's theory states that mass curves space. What is the analogy the text gives for this statement?
23. What causes light to bend as it moves past the sun?
24. Explain how Edwin Hubble's observations of distant galaxies support the big bang theory. Use the term "Doppler effect" in your answer.
25. Why can't we observe distant stars and galaxies as they are right now?

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26. How does the amount of matter in the universe affect the possible futures of the universe?

27. Imagine that you are able to travel back through time. Describe what would happen to the universe's size and temperature as you traveled farther and farther back.