

Worksheet #1

EEn.1.1.1 Explain the Earth's Motion through space.

1. What science did the study of the night sky eventually become?

**Match the correct definition with the correct term. Write the letter in the space provided.**

2. Roughly the amount of time required for the Moon to orbit once around the Earth.

a. day

b. Month

3. The time required for the Earth to orbit Once around the sun.

c. year

4. The time required for the Earth to rotate Once on its axis.

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5. What laws did Kepler state that are still in use today?

6. What did Newton prove about gravity?

7. What did Edwin Hubble prove in 1924?

8. An imaginary point directly above an observer's head.

9. The location of the sun on the first day of spring.

10. Some stars located near Earth's poles can be seen year-round, at all times of night. What are these stars called?

11. What is the name of the effect that describes how the pitch of a sound seems higher as it gets closer and lower as it gets farther away?

12. When a star or galaxy moves quickly away from an observer, the light it emits will appear \_\_\_\_\_.

13. When a star or galaxy move quickly toward an observer, the light it emits will appear \_\_\_\_\_.

14. An effect in which a star or galaxy appears to move quickly away from an observer is called \_\_\_\_\_.

15. An effect in which a star or galaxy appears to move quickly toward an observer is called \_\_\_\_\_.

16. Edwin Hubble discovered that the light from all galaxies except the Milky Way's close neighbors is affected by \_\_\_\_\_.
17. How did Edwin Hubble determine that the universe must be expanding?
18. Explain why you see different constellations in the sky at different times of the year.
19. What is a star?
20. How do all stars begin their lifecycles?
21. During a star's life cycle, hydrogen changes to helium in a process called \_\_\_\_\_?
22. When a star dies, either gradually or in a big explosion, much of its material returns to \_\_\_\_\_.
23. A collection of stars, dust, and gas bound together by gravity is called a(n) \_\_\_\_\_.
24. Large clouds of gas and dust found in space are called \_\_\_\_\_.
25. Draw a picture showing the structure of the universe from smallest to largest. Make sure your picture includes the Universe, Galaxies, Stars, Solar System, and Planets.
26. The study of the origin, structure, and future of the universe is called \_\_\_\_\_.
27. What do scientists know about the current state of the Universe?
28. As the universe expands, how do galaxies move?
29. What evidence supports the big bang theory?
30. What is cosmic background radiation?
31. Nine planets, the sun, and many moons and small bodies are part of our \_\_\_\_\_.
32. Nebulas are a mixture of what two materials?
33. A measure of the average kinetic energy in an object is \_\_\_\_\_.
34. The matter of a nebula is held together by the force of \_\_\_\_\_.

35. How do gravity and pressure keep a nebula from collapsing? Draw a picture to help enhance your explanation.

36. What happens to the attraction between particles in a nebula as it begins to collapse?

37. The largest of the colliding bodies in the solar system are called \_\_\_\_\_, or small bodies.

38. After the planets formed, the center mass of the solar nebula became so dense and hot that it formed \_\_\_\_\_.

*Number the following events in the order in which they happened. Use the numbers 1-6. Write 1 for the first event that happened. Write 6 for the last.*

\_\_\_\_\_ 39. The largest planetesimals grew in size and attracted more gas and dust.

\_\_\_\_\_ 40. The solar nebula began to collapse.

\_\_\_\_\_ 41. The sun was born. The remaining gas and dust were removed from the solar system.

\_\_\_\_\_ 42. The solar nebula began to rotate and flatten. It grew warmer near its center.

\_\_\_\_\_ 43. Planets began to grow as planetesimals collided with one another.

\_\_\_\_\_ 44. Planetesimals began to form.

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45. How does Earth's rotation determine whether it is day or night?

*Match the correct definition with the correct term.*

\_\_\_\_\_ 46. The spinning of a body on its axis.                      A. Revolution

\_\_\_\_\_ 47. The path a body follows as it travels                      B. Rotation  
Around another body in space.

\_\_\_\_\_ 48. A complete trip along an orbit.                      C. Period of Revolution

49. According to Kepler's first law of motion, planets move in a(n)  
\_\_\_\_\_ around the sun.

50. According to Kepler's second law of motion, how does a planet's distance from the sun affect its motion?

51. According to Kepler's third law of motion, what information can be used to find a planet's distance from the sun?
52. What causes the planets that are closer to the sun to move faster?
53. Newton discovered that the force of gravity depends on the distance between objects and the objects' \_\_\_\_\_.
54. Define Inertia.
55. Gravity causes bodies in the solar system to \_\_\_\_\_ one another.
56. List the major objects contained within our solar system.
- 1) \_\_\_\_\_ 2) \_\_\_\_\_ 3) \_\_\_\_\_ 4) \_\_\_\_\_
57. What are the two groups planets are divided into? Which of the two groups does Earth belong to?
58. Why are the inner planets called terrestrial planets?
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*Match the correct definition with the correct term.*

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|---|-------------------------|
| 59. The time that a planet takes to go around the sun once.       | A. Period of rotation   |
| 60. The motion of a body orbiting Another body in space.          | B. Period of revolution |
| 61. The amount of time that an object takes to rotate once.       | C. Year                 |
| 62. The amount of time an object takes to revolve around the sun. | D. Revolution           |
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63. Explain why the sun rises in the west and set in the east on Venus?
64. A planet with a \_\_\_\_\_ rotation appears to spin counterclockwise as seen from above its North Pole.
65. A planet with a \_\_\_\_\_ rotation appears to spin clockwise as seen from above its North Pole.
66. Explain why seasons on Uranus would be more extreme at the poles compared to seasons on Earth at the poles?

67. Describe in detail the motion of the Earth compared to the sun, the solar system compared to the galaxy, and the galaxy compared to the Universe.

68. Draw a diagram that shows the Sun and Earth (with appropriate tilt) during the Vernal Equinox, Autumnal Equinox, Summer solstice, and Winter Solstice.

69. What is precession? What changes would you expect to see during precession?

70. What is nutation, and what causes this to occur?

71. Where is the barycenter located for the Earth/Moon system? Draw a picture labeling the barycenter.