

## MODULE 5

### SPACE ENVIRONMENT

#### Chapter 1 - Space

##### Learning Outcomes

After completing this chapter, you should be able to:

- Describe microgravity.
- Identify characteristics of space.
- Describe what makes up the universe.
- Define constellation.
- Define galaxy.
- Describe nebulae.
- Define interplanetary and interstellar space.

#### Chapter 2 - Solar System

##### Learning Outcomes

After completing this chapter, you should be able to:

- Describe our solar system.
- State basic facts about the planets in our solar system.
- Define a comet.
- Explain the differences between an asteroid, meteoroid and a meteor.
- Recall the differences between solar flares, solar prominences and sunspots.

#### Chapter 1 - Space

1. \_\_\_\_\_ is a region beyond the Earth's atmosphere where there is very little molecular activity.
2. Many people generally agree that space occurs at about \_\_\_\_\_ miles outward from Earth.
3. The \_\_\_\_\_ includes everything, stars, planets, galaxies, animals, plants and humans.
4. Space is characterized by a lack of \_\_\_\_\_.
5. Small or low gravity is called \_\_\_\_\_.
6. Our sun, which is the center of our solar system, is but a tiny spot in our \_\_\_\_\_. In fact, there are \_\_\_\_\_ in our galaxy, and our galaxy is just one of \_\_\_\_\_ of galaxies.
7. A \_\_\_\_\_ is an enormous collection of stars, and these stars are arranged in a particular shape. The three main shapes are \_\_\_\_\_, \_\_\_\_\_ and \_\_\_\_\_.
8. \_\_\_\_\_ is oval shaped. \_\_\_\_\_ has arms spiraling outward from a center. \_\_\_\_\_ has no particular shape.
9. Our galaxy is called the \_\_\_\_\_. It is \_\_\_\_\_ shaped.
10. Galaxies contain giant clouds of gas and dust called \_\_\_\_\_.

11. \_\_\_\_\_ are bodies of hot gases.
12. The \_\_\_\_\_ is a part of the atmosphere divided by its electrical activity.
13. The \_\_\_\_\_ is the primary cause of the Van Allen belts.
14. Most stars are composed of \_\_\_\_\_ and \_\_\_\_\_ in their gaseous state.
15. About half of all stars come in pairs with the stars sharing the same gravitational center. These are called \_\_\_\_\_ stars.
16. A \_\_\_\_\_ is a grouping of stars that look like imaginary figures.
17. The Big Dipper is an example of a \_\_\_\_\_.

## Chapter 2 - Solar System

18. Our \_\_\_\_\_ is the sun and the bodies that orbit around it.
19. Without heat and light, the Earth would be a \_\_\_\_\_, \_\_\_\_\_ - \_\_\_\_\_ planet.
20. The central star of our solar system is the \_\_\_\_\_.
21. The Earth is \_\_\_\_\_ miles from the sun.
22. The sun is composed of about \_\_\_\_\_% hydrogen, \_\_\_\_\_% helium and minor amounts of several other elements. The temperature of the sun ranges from \_\_\_\_\_°C in its coolest regions to over \_\_\_\_\_°C at its center.
23. \_\_\_\_\_ are darker, cooler areas of the sun.
24. \_\_\_\_\_ are short-lived high-energy discharges.
25. \_\_\_\_\_ are larger and longer lasting high-energy discharges.
26. The Earth's Moon has a diameter of about \_\_\_\_\_ miles, which is about \_\_\_\_\_ of the Earth's diameter. The distance from the Earth to the Moon varies from approximately \_\_\_\_\_ miles at its farthest point to \_\_\_\_\_ miles at its nearest point.
27. The Moon rotates on its axis in the same amount of time it takes to orbit the Earth, \_\_\_\_\_ days. Therefore, the same side of the Moon, the \_\_\_\_\_ side, always faces the Earth.
28. When the Moon is on the side of the Earth nearer the sun, the Moon is \_\_\_\_\_. When it is on the opposite side of the Earth, the Moon is \_\_\_\_\_.
29. Primarily, the Moon has two types of terrain, \_\_\_\_\_ and \_\_\_\_\_.
30. Temperatures on the Moon range from about \_\_\_\_\_° in the day, to below \_\_\_\_\_° at night.
31. \_\_\_\_\_ is the closest planet to the sun, and it revolves around the sun every \_\_\_\_\_ days. Its daytime temperature reaches \_\_\_\_\_°F, while its nighttime temperatures reach \_\_\_\_\_°F.
32. \_\_\_\_\_ is the closest planet to Earth. It revolves around the sun in \_\_\_\_\_ days. It is the \_\_\_\_\_ planet in the solar system with temperatures in excess of \_\_\_\_\_°.
33. \_\_\_\_\_ is the only known planet to rotate in a \_\_\_\_\_ manner.
34. The atmosphere of Venus is 96% \_\_\_\_\_ and 4% \_\_\_\_\_.
35. The Earth's atmosphere contains 78% \_\_\_\_\_ and 21% \_\_\_\_\_.
36. The surface of our planet is covered with over 67% \_\_\_\_\_.
37. The Earth revolves around the sun in \_\_\_\_\_ days.
38. Mars is known as the \_\_\_\_\_ planet and even with the naked eye we can see this \_\_\_\_\_ color. This color is due to the \_\_\_\_\_ and \_\_\_\_\_ covering the surface of Mars.

39. The surface of Mars is covered with deserts, high mountains, deep craters and huge \_\_\_\_\_. One of Mars' \_\_\_\_\_ is the highest known mountain in our solar system.
40. The atmosphere of Mars consists of 95% \_\_\_\_\_. Daytime temperatures on Mars reach \_\_\_\_\_°F, while nighttime temperatures can dip to \_\_\_\_\_°F.
41. In July 1997, the space probe called the \_\_\_\_\_ landed on Mars. The next day the rover, \_\_\_\_\_, began its exploration of the planet. The rover was \_\_\_\_\_ feet long and \_\_\_\_\_ foot tall.
42. Next to Earth, \_\_\_\_\_ has the most favorable conditions for life of any of the other planets in our solar system.
43. \_\_\_\_\_ is the largest planet in our solar system. It is \_\_\_\_\_ times larger than Earth.
44. Jupiter is a gas giant, with \_\_\_\_\_ accounting for about 90% of the atmosphere, followed by \_\_\_\_\_, \_\_\_\_\_ and \_\_\_\_\_.
45. A distinguishing feature of Jupiter is \_\_\_\_\_ Spot. This spot is a giant storm that is \_\_\_\_\_ miles long and \_\_\_\_\_ miles wide. Also, Jupiter is known for its \_\_\_\_\_ moons.
46. The rings are the most recognizable feature of \_\_\_\_\_. The rings are made of \_\_\_\_\_ chunks of \_\_\_\_\_ ranging from tiny \_\_\_\_\_ to large \_\_\_\_\_.
47. The main rings are made up of hundreds of narrow \_\_\_\_\_.
48. The entire ring system is about \_\_\_\_\_ thick and extends about \_\_\_\_\_ miles from the planet.
49. Saturn has an \_\_\_\_\_ core surrounded by metallic \_\_\_\_\_ with an outer layer of \_\_\_\_\_ and \_\_\_\_\_.
50. It takes Saturn \_\_\_\_\_ years to revolve around the sun.
51. The winds of Saturn have been known to reach \_\_\_\_\_ mph.
52. Saturn is \_\_\_\_\_ miles from the sun.
53. \_\_\_\_\_, one of the moons of Saturn, is the only moon in the solar system to have its own \_\_\_\_\_.
54. \_\_\_\_\_ is about 1.7 billion miles from the sun. It has a rocky core surrounded by \_\_\_\_\_, \_\_\_\_\_ and \_\_\_\_\_, in both \_\_\_\_\_ and \_\_\_\_\_ form.
55. Uranus revolves around the sun in \_\_\_\_\_ years. Daylight lasts for \_\_\_\_\_ years followed by \_\_\_\_\_ years of night.
56. Uranus also has 11 very narrow and black \_\_\_\_\_ around it.
57. Neptune is about \_\_\_\_\_ miles from the sun and takes \_\_\_\_\_ Earth years to complete an orbit.
58. Neptune's atmosphere consists of \_\_\_\_\_, \_\_\_\_\_ and \_\_\_\_\_.
59. The \_\_\_\_\_ gives Neptune a bluish color.
60. \_\_\_\_\_ is the most windy planet in the solar system. It has recorded winds of \_\_\_\_\_ mph.
61. \_\_\_\_\_ is the smallest planet in our solar system. It is a dark and \_\_\_\_\_ planet. Its surface is made up of \_\_\_\_\_.
62. Asteroids, comets and meteoroids are collectively thought of as \_\_\_\_\_ orbiting in space.

63. \_\_\_\_\_ are chunks of rock that range in size from particles of dust to some that are a few hundred miles across.
64. Most \_\_\_\_\_ travel in an orbit between Mars and Jupiter. This area is known as the \_\_\_\_\_.
65. A \_\_\_\_\_ is described as a giant dirty \_\_\_\_\_. It is composed of \_\_\_\_\_ gases, \_\_\_\_\_ and \_\_\_\_\_.
66. \_\_\_\_\_ are tiny particles of dust and sand that are usually leftover from a comet.
67. If a meteoroid enters the Earth's atmosphere it is called a \_\_\_\_\_.
68. Meteors that actually hit the Earth are called \_\_\_\_\_.