

MULTIPLE CHOICE

1. If the size of the Sun is represented by a baseball with the Earth is about 15 meters away, how far away, to scale, would the nearest stars to the Sun be?
 - a. About the distance between New York and Boston.
 - b. 100 meters away
 - c. About the distance across the United States.
 - d. About the distance across 50 football fields.

ANS: C PTS: 1

2. A solar system contains
 - a. primarily planets.
 - b. large amounts of gas and dust but very few stars.
 - c. large amounts of gas, dust, and stars.
 - d. a single star and planets.
 - e. thousands of superclusters.

ANS: D PTS: 1

3. A galaxy contains
 - a. primarily planets.
 - b. large amounts of gas and dust but very few stars.
 - c. large amounts of gas, dust, and stars.
 - d. a single star and planets.
 - e. thousands of superclusters.

ANS: C PTS: 1

4. How many centimeters are there in one kilometer?
 - a. 100
 - b. 1000
 - c. 10,000
 - d. 100,000
 - e. 1×10^6

ANS: D PTS: 1

5. Scientific notation is used in science because
 - a. it makes it easy to write large or small numbers.
 - b. all astronomical distances are expressed in metric units.
 - c. it makes conversions between units easy.
 - d. all of the above.
 - e. none of the above.

ANS: A PTS: 1

6. The average distance from Earth to the sun is
 - a. 1 ly
 - b. 1 million km
 - c. 1 million miles
 - d. 1 billion km

e. 1 AU

ANS: E PTS: 1

7. 2.9×10^7 is the same as

- a. 2.9 thousand.
- b. 29 thousand.
- c. 290 thousand.
- d. 2.9 million.
- e. 29 million.

ANS: E PTS: 1

8. 64,200,000,000 is equal to

- a. 6.42×10^7
- b. 6.42×10^{-7}
- c. 6.42×10^{10}
- d. 6.42×10^{-10}
- e. $1.0 \times 10^{64.2}$

ANS: C PTS: 1

9. 3.0×10^5 times 1.5×10^9 is equal to

- a. 4.5×10^{45}
- b. 4.5×10^{14}
- c. 2.0×10^4
- d. 2.0×10^{14}
- e. 2.0×10^{45}

ANS: B PTS: 1

10. 4.4×10^6 divided by 8.8×10^{10} is equal to

- a. 5.0×10^{-5}
- b. 5.0×10^{-4}
- c. 5.0×10^4
- d. 3.9×10^{17}
- e. 3.9×10^{16}

ANS: A PTS: 1

11. If light takes 8 minutes to reach Earth from the sun and 250 minutes to reach the planet Neptune, what is the approximate distance from the sun to Neptune? Pick the closest-to-correct answer.

- a. 5 AU
- b. 30 AU
- c. 30 ly
- d. 5 ly
- e. 500 ly

ANS: B PTS: 1

12. If the light takes 8 minutes to reach Earth from the sun and the nearest star is 4.7 ly from the sun, what is the distance from the sun to the nearest star in astronomical units?

- a. 37.6 AU
- b. 1.7 AU
- c. 214 AU

- d. 310,000 AU
- e. 1.5×10^{11} AU

ANS: D PTS: 1

13. The sun is
- a. a star.
 - b. 1 AU from Earth.
 - c. more than 100 times the diameter of Earth.
 - d.** all of the above.
 - e.** none of the above.

ANS: D PTS: 1

14. If the nearest star is 4.2 light-years away, then
- a. the star is 4.2 million AU away.
 - b. the light we see left the star 4.2 years ago.
 - c. the star must have formed 4.2 billion years ago.
 - d. the star must be very young.
 - e. the star must be very old.

ANS: B PTS: 1

15. The radius of the moon's orbit is about ____ times larger than the radius of Earth.
- a. 0.6
 - b. 6
 - c. 60
 - d. 600
 - e. 6000

ANS: C PTS: 1

16. The Milky Way Galaxy
- a.** contains about 100 stars.
 - b.** is the largest known object in the universe.
 - c.** is about 75,000 light-years in diameter.
 - d.** is located about 2.2 million light years from the sun.
 - e.** Only a and c are correct.

ANS: C PTS: 1

17. Which of the following is the largest?
- a. the diameter of Earth
 - b. the diameter of the moon
 - c. the diameter of the sun
 - d. the diameter of Jupiter
 - e. the distance from Earth to the sun

ANS: E PTS: 1

18. Which arrangement is in order of increasing size, left to right?
- a. planet, galaxy, star, solar system
 - b. planet, star, galaxy, solar system
 - c. planet, star, solar system, galaxy
 - d. solar system, galaxy, star, planet

ANS: C PTS: 1

19. The Milky Way Galaxy
- a. contains about 100 billion stars.
 - b. is about 100 light-years in diameter.
 - c. is the largest known object in the universe.
 - d. a, b, and c are correct.
 - e. Only a and c are correct.

ANS: A PTS: 1

20. If the Milky Way Galaxy contains 100 billion stars and only one star in 100 has an Earth-like planet, how many stars in the Milky Way Galaxy have Earth-like planets?
- a. 1
 - b. 1000
 - c. 1,000,000
 - d. 1,000,000,000 = one billion
 - e. 100 billion

ANS: A PTS: 1

21. In science fiction movies, it is common to use a space craft to travel across the Milky Way Galaxy or to assert that we have been visited by alien space craft from the other side of the Milky Way Galaxy. If one has a space craft that can travel at the speed of light, to an observer on the earth, how long will it take to go from one edge of the Milky Way Galaxy to the other and return?
- a. 4.6 years
 - b. 9.2 years
 - c. 1000 years
 - d. 15,000 years
 - e. 150,000 years

ANS: E PTS: 1

22. Suppose we wish to travel to the nearest star using a super space ship capable of traveling at 1×10^{10} km/yr. We have nothing even close to this space ship yet. How long will it take us to get to the nearest star which is about 4×10^{13} km away from us?
- a. 4 years
 - b. 400 years
 - c. 4000 years
 - d. 4 billion years

ANS: C PTS: 1

23. What does the size of the image of a star in a photograph tell us about the star?
- a. the diameter of the star
 - b. the brightness of the star
 - c. the mass of the star
 - d. the temperature of the star
 - e. the distance to the star

ANS: B PTS: 1

24. Earth has a radius of about 6400 km, the sun has a radius of about 7.0×10^5 km, and a rubber ball has a radius of 6.4 cm. If you were to construct a scale model of the solar system using the rubber ball to represent the earth, what is the radius of a ball needed to represent the sun in your model?

- a. 7.0×10^5 cm
- b. 7.0 cm
- c. 700 cm
- d. 70 cm
- e. 7000 cm

ANS: C PTS: 1

25. Earth has a radius of about 6400 km, the sun has a radius of about 7.0×10^5 km. Assume Earth to be a typical planet and the sun to be a typical star. If you were to attempt to use a telescope to observe an Earth type planet circling the nearest star, one AU from that star, which would be easier to see with the telescope, the star or the planet?
- a. Both would be equally hard to observe.
 - b. the star
 - c. the planet
 - d. Both would be easily observed.

ANS: C PTS: 1

26. If the Earth were represented as a basketball (~10 in) and the Moon as a baseball (~3 in) then, to order of magnitude, what size would best represent the diameter of the Sun?
- a. 10 ft
 - b. 100 ft
 - c. 1000 ft
 - d. 10000 ft

ANS: B PTS: 1

27. Which sequence is correct when ordered by increasing size?
- a. Earth, Solar System, Milky Way, galaxy clusters
 - b. Solar System, Earth, galaxy clusters, Milky Way
 - c. Earth, Milky Way, Solar System, galaxy clusters
 - d. Galaxy clusters, Solar System, Milky Way, Earth

ANS: A PTS: 1

28. How is a planet different than a star?
- a. Planets are larger than stars.
 - b. Planets reflect light while stars produce their own light.
 - c. Stars move faster in the sky than planets.
 - d. Planets are brighter than stars.

ANS: B PTS: 1

29. If we say that an object is 1,000 light-years away we see it
- a. as it looked 1,000 years ago.
 - b. as it would appear to our ancestors 1,000 years ago.
 - c. as it looked 1,000 light-years ago.
 - d. as it is right now, but it appears 1,000 times dimmer.

ANS: A PTS: 1

30. If the distance from the Sun to the Earth is represent by roughly 15 meters, then the distance from the Earth to the Moon on the same scale would be
- a. about 30 meters.
 - b. about 10 meters.

- c. about 1 meter.
- d. smaller than your hand.

ANS: D PTS: 1

31. Which arrangement is correct in increasing order of mass left to right?
- a. planet, star, galaxy
 - b. star, planet, galaxy
 - c. galaxy, star, planet
 - d. planet, galaxy, star
 - e. star, galaxy, planet

ANS: A PTS: 1

32. Almost all of us humans live on the surface of which one of the following?
- a. galaxy
 - b. planet
 - c. star
 - d. solar system

ANS: B PTS: 1

33. Most of us humans live inside which one of the following?
- a. star
 - b. planet
 - c. galaxy

ANS: C PTS: 1

34. Our solar system has _____ at its center.
- a. billions of stars
 - b. one planet
 - c. billions of planets
 - d. one star

ANS: D PTS: 1

TRUE/FALSE

1. The average distance from Earth to the sun is 1 AU.

ANS: T PTS: 1

2. The nearest star is 1 ly from the solar system.

ANS: F PTS: 1

3. A light-year is the distance light travels in one year.

ANS: T PTS: 1

4. A kilometer contains 1 million meters.

ANS: F PTS: 1

5. The metric system is a decimal system.

ANS: T PTS: 1

6. The sun is a star in the Milky Way Galaxy.

ANS: T PTS: 1

7. The Local Group contains the sun and only about two dozen other stars.

ANS: F PTS: 1

8. A supercluster refers to a large group of stars within the Milky Way.

ANS: F PTS: 1

9. A kilometer is a longer measure of distance than a mile.

ANS: F PTS: 1

10. Mars is farther from the Sun than the Earth.

ANS: T PTS: 1

COMPLETION

1. The number 52,600,000,000 would be written in scientific notation as _____.

ANS: 5.26×10^{10}

PTS: 1

2. The average distance from Earth to the sun is one _____.

ANS: astronomical unit

PTS: 1

3. Light takes about 8 minutes to travel from the sun to Earth and about 40 minutes to travel from the sun to Jupiter. Jupiter is about _____ AU from the sun

ANS:

Five

five

5

PTS: 1

4. The _____ contains a large amount of gas and dust and about 100 billion stars, and our sun is one of those stars.

ANS: Milky Way Galaxy

PTS: 1

5. A(n) _____ composed of galaxies and clusters of galaxies is the largest known structure in the universe.

ANS: filament

PTS: 1

6. A(n) _____ is a collection of billions of stars.

ANS: galaxy

PTS: 1

ESSAY

1. Draw a schematic (not to scale) diagram showing the sun, the earth circling around it, and the other seven planets with labels for each orbit.

ANS:

Answer not provided.

PTS: 1

2. Draw a schematic (not to scale) diagram showing our solar system, nearby stars, and other stars making up our Milky Way Galaxy as dots. You do not have to draw 100 billion dots as stars!

ANS:

Answer not provided.

PTS: 1

3. Explain the difference between a light-year and the orbital period of Earth.

ANS:

Answer not provided.

PTS: 1

4. Why would the English system of units be more useful if a foot contained 10 inches?

ANS:

Answer not provided.

PTS: 1

5. Why do we measure some astronomical distances in light-years and some distances in astronomical units?

ANS:

Answer not provided.

PTS: 1

6. From what you know about astronomical units and light-years, how would you define a light-minute?

ANS:

Answer not provided.

PTS: 1

7. "I live 20 minutes from Center City." How is this statement similar to giving astronomical distances in light-years?

ANS:

Answer not provided.

PTS: 1

8. Discuss why a faster than light method of space travel would be needed for a civilization spanning the entire Milky Way Galaxy.

ANS:

Answer not provided.

PTS: 1

9. Explain how a good scientific argument differs from say an advertisement you may be on television.

ANS:

Answer not provided.

PTS: 1

10. Discuss the benefits of expressing numbers in scientific notation.

ANS:

Answer not provided.

PTS: 1

11. Assume a textbook shows a diagram of the solar system on, say, a standard notebook sized sheet. The orbits of eight planets are sketched around the sun at the center. Disks on each orbit are large enough to show features like continents on Earth or the rings of Saturn. There is a similar sized disk for the Sun with some sunspots. Discuss what is wrong or right with this diagram.

ANS:

Answer not provided.

PTS: 1