Space 2- Non-Planet Objects

**Asteroids**

1. Most asteroids in our solar system are found in a ring between **Mars** and **Jupiter** called the **Main** **Asteroid** **Belt**.

2. **Ceres** is the largest asteroid in our solar system.

3. **International** **Astronomical** **Union** or **IAU** is the organization responsible for naming the asteroids.

4. Asteroids planets rotate around the **sun** and spin on an **axis**.

5. Asteroids are made from materials such as **Silicone**, **Nickel**, **Iron**, and **Carbon**.

6. Asteroids that hit our atmosphere are called **meteors**.

7. A meteor that does not burn up in the atmosphere and hits the Earth is called a **meteorite**.

**Blackholes**

8. A **black** **hole** is a region of the universe that can permanently trap anything in it.

9. Scientists believe that black holes may form by the **collapsing** of a **large** **star** or through the collection matter in the center of the galaxy.

10. Black Holes are invisible because not even **light** can escape them.

11. What is the edge of a black hole called? Event Horizon

12. What are the dimensions that make up space-time? Time, length, height, width

13. In physical terms, what is the best definition of a black hole? A hole in the fabric of **space**-**time**.

**Comets**

14. A **comet** is a large frozen mass of dust and gas.

15. What is the long end of the comet called? The **tail**

16. Where do scientists believe comets are from? The **Oort** **Cloud** or the **Kuiper** **Belt**

17. What is the haze around the comet called? **Coma**

18. The nucleus and the coma form and comets **head**.

**Constellations**

19. A **constellation** is a bright, concentrated pattern of star.

20. To an astronomer, a constellation is not just an individual cluster like Orion, but a larger **region** of the sky.

21. Astronomers have divided the **Celestial** **Sphere** into 88 regions.

22. The Celestial Sphere is how we see the **universe** from our position on Earth.

23. Constellation shapes were designed to represent pictures.

24. Pieces is a constellation that is represented by two fish.

25. Ursa Major is a constellation that is represented by bear.

26. Most of these constellation “pictures” represent some sort of **myth**.

27. The stars in the constellations are part of the **Milky** **Way**.

28. Constellations rise in the **east** and set in the **west**.

29. **Circumpolar** **constellations** can be seen year round because they appear above the Polar Regions.

30. **Ursa** **Minor** is visible year around and contains Polaris, which is the North Star.

31. The **Zodiac** **constellations** are located in the **ecliptic** region of the sky, which is the region around the equator.

**Dark Matter**

32. **Dark** **Matter** is a theoretical substance that makes up makes of the universe.

33. **Theoretical** means that it is believed to exist, but there is no proof.

34. Dark Matter was first proposed by Swiss-American Astronomer **Fritz** **Zwicky**.

35. Everything including stars, planets, and even whole galaxies rotate because of **gravity**.

36. Zwicky proposed that galaxies were made up of more than they appeared because of the **missing** **mass** **problem**.

37. The missing mass problem is the postulate that galaxies spin around each other faster than their seeming **mass** should make them, making it seem like they were made of a **far** **greater** mass.

38. Dark matter is not able to be detected because it does not give off **light**, **radiation**, or **radio** **waves**.

39. If you were hit by dark matter, it would **pass right through you**.

40. **Gravitational** **lensing**, which is a another basis for the belief in dark matter, occurs when light is bent seemingly by nothing at all.

41. Some scientist believe that dark matter is made out of **neutrinos**, which are fast moving particles even smaller than electrons.

42. Other scientists believe dark matter is just **super**-**dense** **matter** that, because of its density, reflect electro-magnetic waves.

**Eclipse**

43. An **eclipse** is when the light from the sun or moon is going to be blocked for a period of time.

44. A **lunar** **eclipse** is when the Earth blocks light from the sun to the moon.

45. A **solar** **eclipse** is when the moon passes directly in front of the sun.

46. The only part of the sun visible during a solar eclipse is the **corona**.

47. You need a **special** **device** to view a solar eclipse because looking at one without one can cause **eye** **damage**.

Space 3- Non-Planet Objects Continued

**Exoplanets**

1. **Extrasolar** Planets or **exoplanets** are planets found outside of our solar system.

2. One way that astronomers detect stars that may have possible exoplanets is to watch for **slight** **movement** of the star in response to having a planet circling it.

3. **Astrometry** detects exoplanets by looking at a star’s **wobble**.

4. Astrometry is somewhat unreliable because of the effects of the **Earth**.

5. **Radial** **Velocity** **Method** uses the **Doppler** method to measure differences in distance between the Earth and a star thought to have an exoplanet.

6. **Photometry** is used to identify stars with exoplanets by measuring tiny changes in the intensity of light when a planet passes in front of the star.

7. **Infra**-**red** telescopes are used to find exoplanets by their heat signature.

**Galaxies**

8. A **galaxy** is a massive cluster of stars.

9. There are three basic shapes of galaxies: **irregular**, **spiral**, and **elliptical**.

10. **Irregular** galaxies consist mainly of young stars.

11. **Spiral** shaped galaxies are disk shaped and consist mainly of middle-aged aged stars and a moderate amount of cosmic dust.

12. **Elliptical** galaxies can be shapes varying from round to flat and consist mainly of older stars and have little dust or galaxies.

13. Galaxies are continually **moving** **away** from each other.

14. The light from a star or object moving away from us would be experiencing **redshift**.

15. The light from a star or object moving toward us would be experiencing **blueshift**.

**Life Cycle of Stars**

16. Stars start as clouds of dust and gas called **stellar** **nurseries**.

17. The first stage of a star is the **protostar** which is when stellar masses form and begin to produce heat.

18. When a protostar’s mass begins nuclear fusion, the star ignites beginning the star’s next phase, the **main** **sequence**.

19. What happens to a star after its main sequence depends on the star’s **mass**.

20. Medium density stars, like our sun, shrink into a **white** **dwarf**.

21. Before a star collapses into a white dwarf it first expands into a **Red** **Giant**.

22. Red Giants expand to many times its size as it begins burning up its **helium**.

23. The dust and gases from the collapsed Red Giant form a **Planetary** **Nebula**.

24. Larger density stars collapse so quickly that they explode in an explosion called a **Supernova**.

25. Some cores from Supernovas collapse, compressing electrons and protons into neutrons, from a **Neutron** **Star**.

26. Some of the Neutron Stars spin rapidly, emitting radio waves. These stars are called **pulsars**.

27. Super dense stars, more than ten times bigger than our sun, will collapse upon itself forming a **singularity** or **black** **hole**.

**Milky Way:**

28. There are between **200** billion and **400** billion stars in the Milky Way.

29. Our galaxy is called the Milky Way because it has a **hazy** look in the night time sky.

30. From the outside of our galaxy, the Milky Way looks like a **spiral** with a **band** across the middle.

31. Our Milky Way is called a **Barred** **Spiral**.

32. What is a galactic year? The time it takes for the sun to **orbit around the center of the galaxy**.

33. How many major arms does the Milky Way spiral have? **4**

34. Where is the Milky Way Galaxy’s Halo? **Outside the disk**.

35. It is thought that there is a black hole in the **center** of the galaxy.

36. Our sun is found in the **Orion** **Arm**.

**Outer Solar System**

37. What are all objects orbiting the sun beyond Neptune known as? **Trans**-**Neptunian** **Objects**

38. What is the Oort Cloud thought to be composed of? **Billions** **of** **small** **objects** **like** **comets**.

39. What are charged particles emitting from the sun called? **Solar** **wind**

40. Pluto, Charon, and Quaoar are all members of the **Kuiper** **Belt**.

41. **Orcus**, **Quaor**, and **Varuna** are other larger Kuiper Belt objects.

42. Just after the Kuiper Belt are scattered objects called the **scattered** **disc**.

43. The largest dwarf planet in the solar system is **Eris**.

44. One of the reddest bodies in the solar system is **Sedna**.