Science Space Exploration Unit Test-Review Questions

**Vocabulary: Define the following terms**

**Use the glossary and textbook if you cannot find the definitions in your notes.**

* geocentric
* heliocentric
* elliptical
* black hole
* galaxy
* Hertzsprung-Russell Diagram
* solar system
* astronomical unit
* light-year
* azimuth
* altitude
* satellites-low earth orbit and geosynchronous; remote sensing
* telescopes-optical (reflecting and refracting), radio, x-ray, segmented mirror, interferometry, Hubble Space Telescope
* spectra
* Doppler Effect-blue shift and red shift stars
* Electromagnetic radiation spectrum-frequency and wavelength
* parallax
* triangulation
* space junk
* rockets-structural and mechanical elements, fuel, payload, staged rockets, action, reaction and thrust

**Practice Questions**

1. Compare the heliocentric model and the geocentric model of the solar system by drawing a diagram of each system.

**SEE DIAGRAMS ON PAGE 373-374**

1. What is the order of the planets starting from the sun.

**Mercury, Venus, Earth Mars, Jupiter, Saturn, Uranus, Neptune, Pluto**

1. One astronomical unit is equivalent to the distance between the **centre of the sun** and the **centre of the earth**.
2. Why are both astronomical units and light years needed as units to describe distances in outer space?

**Astronomical units are sufficient to describe distances between planets in our solar system however light years are needed to describe distances that are much larger (such as between Earth and our nearest star, Proximi Centuri, is 4.243 light years or 268331.89 astronomical units)**

1. One light year is equal to how many astronomical units?

**One light year equals 63241.1 astronomical units.**

1. What name is given to the compass direction when we are trying to locate an object in the night sky?

**azimuth read page 401-405 for a refresher**

1. What is the point directly overhead called?

**zenith read pg 401**

1. The table below has two incorrect entries
   1. Identify each error and correct it.

**Reading 1-The altitude cannot be greater than 90°. Instead it should be 87°.**

**Reading 2-The azimuth cannot be greater than 360°. The azimuth should be 4°.**

* 1. Explain why each of the two entries is incorrect

|  |  |  |
| --- | --- | --- |
| Reading | Azimuth | Altitude |
| 1 | 30° | 93° |
| 2 | 364° | 45° |

1. Is it ever possible to specify the location of an object in the sky knowing only the altitude? Explain your answer.

**No. Both the altitude and the azimuth are needed for locating the star.**

1. List three uses for satellites.

**Communication satellites, remote sensing and on personal tracking devices (e.g. GPS). Page 427-430 in textbook.**

1. Compare low earth orbit satellites and geosynchronous satellites.

**Low earth orbit satellites are between 200 and 800km above the planet while geosynchronous satellites are between 36000km above the equator.**

**Geosynchronous satellites will be stationary over one point on the earth while low-earth satellites orbit satellites revolve around the earth in approximately 1.5 hours.**

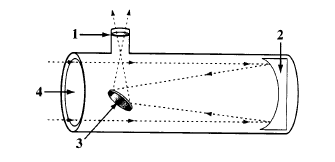
1. What is meant by space is a “vacuum”?

Because of the low pressure that is due to the lack of atmosphere and lack of matter.

1. Complete the following table: See your notes from our jigsaw activity. Refer to page **See pages 435-439 for details.**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Type | Diagram | Description | What is it used for and advantages to other telescopes | What type of electromagnetic radiation is used |
| Optical (reflecting) |  |  |  | Visible light |
| Optical (refracting) |  |  |  |  |
| X-Ray |  |  |  |  |
| Radio |  |  |  |  |
| Segmented-mirror |  |  |  |  |

1. Label the numbered parts of the following diagram. What type of telescope is this? **See page 437 for labeled diagram.**



1. What is interferometry and why is it advantageous to astronomers?

**Interferometry-combining two or more telescopes. This creates an image of higher resolution.**

1. What is a spectral analysis?

**Long-distance chemistry-determining the composition of the star by observing the absorption or emission spectra of the star (fingerprint).**

1. What can a star’s spectrum indicate about a star?

**What gasses the star is made of.**

1. What type of shift in the spectrum would you expect from a star that was:
   1. Moving towards the Earth. **Blue shift**
   2. Moving away from Earth. **Red shift**
   3. Moving in the same direction as Earth, at the same speed as Earth?
   4. Moving at right angles to the direction of sight. **No shift.**
2. List step-by-step how you would determine the distance between a target object and yourself using triangulation. Be detailed. A diagram may help. **See your triangulation notes from class.**
3. List and describe three environmental hazards of space.

**Cosmic radiation, space junk, solar radiation etc…**