1. All electromagnetic radiation (including radio waves, infrared waves, UV rays, gamma rays) travels at the speed of light. This speed is a constant (c) which is equal to:

|  |  |  |
| --- | --- | --- |
|  | a. 186,000 mi/sec |  |
|  | b. 300,000 km/s |  |
|  | c. 300,000,000 m/s |  |
|  | d. all are correct |  |

1. A \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ is the distance between 2 peaks (or troughs) on a wave and is usually measured in meters.

|  |  |  |
| --- | --- | --- |
|  | a. frequency |  |
|  | b. speed of light |  |
|  | c. wavelength |  |
|  | d. amplitude |  |

1. This part of the electromagnetic spectrum has the shortest wavelengths and highest frequencies. Only nuclear reactions (such as the fission of Uranium) can produce such high energy radiation.

|  |  |  |
| --- | --- | --- |
|  | a. radio waves |  |
|  | b. gamma rays |  |
|  | c. microwaves |  |
|  | d. ultraviolet (UV) rays |  |
|  | e. X rays |  |

1. A \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ telescope uses mirrors to bring light to a focus.

|  |  |  |
| --- | --- | --- |
|  | a. reflecting |  |
|  | b. refracting |  |
|  | c. radio |  |
|  | d. interferometry |  |

1. A \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ is a device that uses a prism or a diffraction grating to break down light emitted or absorbed by chemical elements into specific lines of color.

|  |  |  |
| --- | --- | --- |
|  | a. interferometer |  |
|  | b. telescope |  |
|  | c. spectroscope |  |
|  | d. photometer |  |

1. A \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ telescope uses lenses to bring light to a focus.

|  |  |  |
| --- | --- | --- |
|  | a. reflecting |  |
|  | b. interferometry |  |
|  | c. refracting |  |
|  | d. radio |  |

1. Since the speed of light is a constant, as wavelength increases on the spectrum, then frequency must \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

|  |  |  |
| --- | --- | --- |
|  | a. increase |  |
|  | b. decrease |  |
|  | c. remain the same |  |
|  | d. fluctuate |  |

1. Humans can only see the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ portion of the electromagnetic spectrum.

|  |  |  |
| --- | --- | --- |
|  | a. visible light |  |
|  | b. infrared |  |
|  | c. ultraviolet |  |
|  | d. radio wave |  |

1. The \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ refers to the number of waves that occur each second. It is directly related to the energy of a wave, and is usually measured in Hertz (Hz).

|  |  |  |
| --- | --- | --- |
|  | a. wavelength |  |
|  | b. amplitude |  |
|  | c. speed |  |

d. frequency

1. The \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ portion of the EM spectrum has the longest wavelengths and lowest frequencies. This is also the lower energy end of the spectrum.

|  |  |  |
| --- | --- | --- |
|  | a. radio wave |  |
|  | b. gamma ray |  |
|  | c. visible light |  |
|  | d. infrared |  |
|  | e. microwave |  |

1. All forms of electromagnetic radiation, including radio waves, x-rays, microwaves, and UV rays, make up the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

|  |  |  |
| --- | --- | --- |
|  | a. frequency |  |
|  | b. wavelength |  |
|  | c. electromagnetic spectrum |  |
|  | d. magnetic field   1. Telescopes have a primary or \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ lens that used to collect light. The wider this lens is, the greater its light gathering capacity.  |  |  |  | | --- | --- | --- | |  | a. objective |  | |  | b. spectroscope |  | |  | c. eyepiece |  | |  | d. focusing |  |  1. Telescopes have a(n) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ lens, which is a secondary lens that is used to magnify the image so it can be seen by the observer.  |  |  |  | | --- | --- | --- | |  |  |  | |  |  |  | |  |  |  | | 1. Spectroscope b. objective c. eyepiece d. concave |  |  | |  |  |  | | Short Answer   1. Explain why large, powerful telescopes are built on mountaintops in rural areas. 2. What are the differences between a radio telescope and a visible light telescope? 3. What are the advantages of the Hubble Space telescope? 4. Use the diagram below: 5. Which type of electromagnetic radiation has the lowest frequency? Highest frequency? 6. How does frequency relate to energy on the electromagnetic spectrum? 7. As the frequency of the waves increases, what happens to the wavelength? Why? 8. In the visible spectrum, which color has the highest frequency? The lowest frequency? The highest energy? The lowest energy? 9. Which has more energy: radio waves or x-rays? Infrared waves or UV rays? Gamma rays or microwaves?   [File:EM Spectrum Properties edit.svg](http://upload.wikimedia.org/wikipedia/commons/c/cf/EM_Spectrum_Properties_edit.svg) |  |  | |  |

