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| The number of waves per second; directly related to the energy of the wave  Includes the range of all electromagnetic radiation; classified according to wavelength and frequency | Short wavelength, high frequency, high-energy radiation  **Frequency**  **wavelength** | **Radio waves**  The distance from one crest of a wave to the next  Uses two or more convex mirrors to magnify an image | Long wavelength, low frequency, low energy waves; can be very large  Uses two or more convex lenses to magnify an image |
| An instrument used to break up light into its component colors to determine the elements that are present in a star  **Electromagnetic spectrum**  **Speed of light** | Dark lines that occur when a cooled substance absorbs light (at particular wavelengths)  **Gamma rays**  **spectroscope**  **Emission spectrum** | **Radio telescope**  Emitted by a bright liquid or solid and contains all wavelengths of colors that compose bright light  **Reflecting telescope**  **Absorption spectrum** | **Refracting telescope**  **Continuous spectrum**  Scheduled to be launched in 2018; will study infrared radiation from distant planets and stars |
| Equals 3 x 108 m/sec or 3 x 105 km/sec  **Red shift** | Occurs when a star or galaxy is moving away from the observer; light from the object is increased in wavelength, or shifted to the red end of the spectrum.  engths appear shufted towards longer  Occurs when a heated substance emits bright spectral lines (at a particular wavelength)  **Interferometry** | A large, dish shaped antenna that is used by itself or in an array with others to detect radio waves  **Hubble Space Telescope**  An array of telescopes acting together to view objects with higher resolution | **James Webb Telescope**  Orbits earth every 97 minutes; has visible, IR and UV cameras |