What You Should Know About "Standard Candles"!

1.) Why are "standard candles" useful? (In trying to determine the distance to a star, we need a star's luminosity. The idea of a standard candle is one way to do this.)

2.) When is a star considered a "standard candle?" (when its variation of apparent brightness is related to the star's luminosity)

3.) Give two examples of standard candles? (Cepheid stars and Type Ia supernovas)

4.) How are Cepheids and Type Ia supernovas different as standard candles? (Cepheid's are stars whose apparent brightness varies anywhere from one day to 100 days. The FREQUENCY of the variation is related to the amount of energy put out by the star per unit time (i.e., it's average luminosity). So observing a Cepheid's light curve frequency yields the star's luminosity. A Type 1a supernova starts out very bright. The *rate* at which the apparent brightness dims is proportional to the star's luminosity. So recording the light curve as the supernova's light diminishes allows us to determine the star's original luminosity. In short, and in both cases, looking at how the star's apparent brightness changes with time tells us its luminosity.)