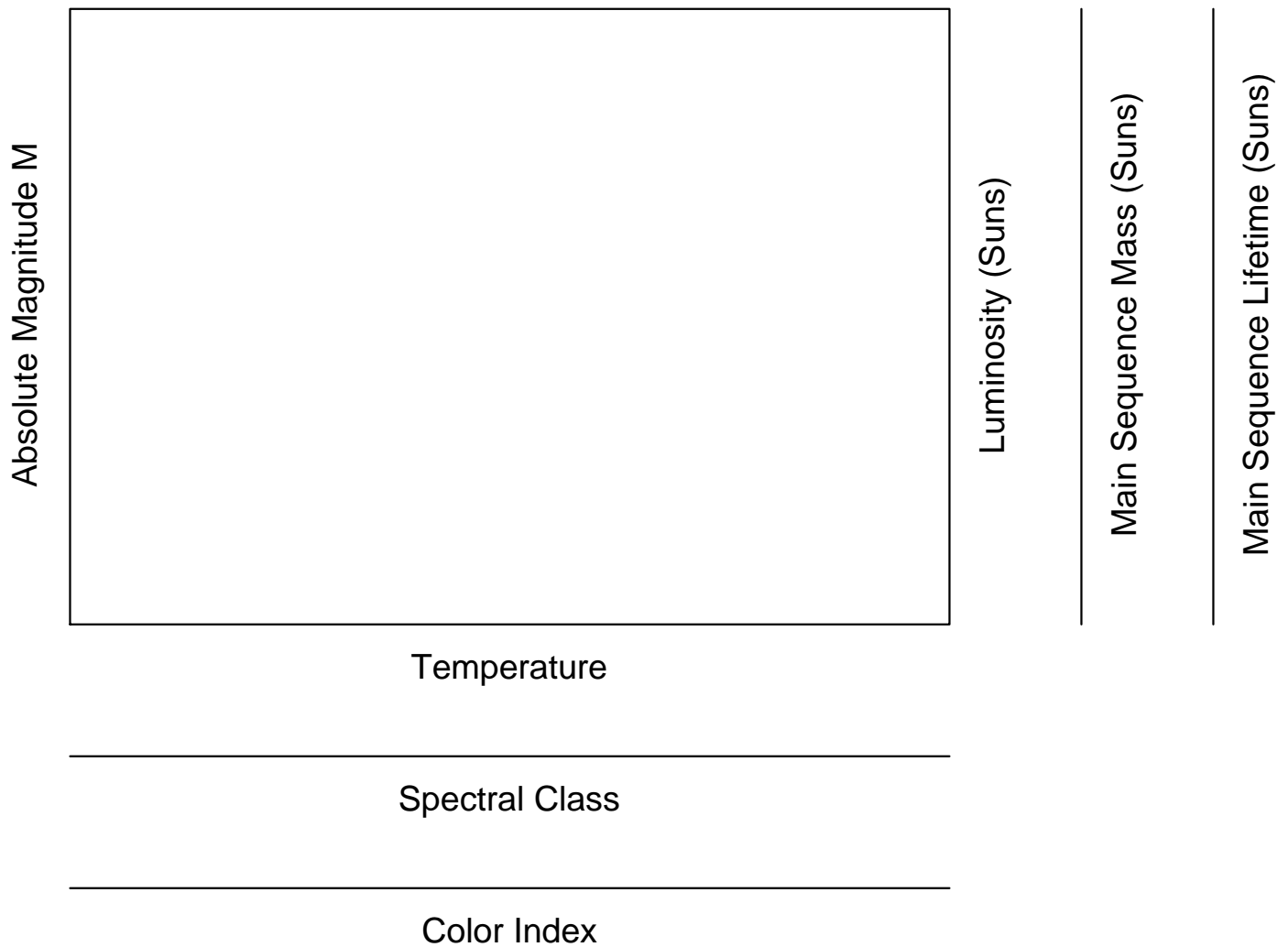


THE HERTZSPRUNG - RUSSELL RELATIONSHIP



Apparent magnitude m ; a measure of a star's brightness as it appears from Earth.

Absolute magnitude M ; a measure of a star's intrinsic luminosity; $m = M$ at a distance to the star of 10 pc.

Luminosity is a measure of M using the Sun as reference.

Distance D to a star is measured by trig parallax or eclipsing binary stars.

$$m - M = 5 \log (D/10) ; M(\text{Sun}) = 4.87; L(\text{Sun}) = 1$$

Stellar temperature T measured using strengths of spectral lines.

Spectral class is measured from the appearance of spectral lines; O B A F G K M; O hottest, M coolest.

Color Index measured using m at two different wavelengths; e.g., for perfect radiators, $B - V = -0.71 + 7090/T$

These are all measures of stellar temperature

Stellar masses measured using Newton's Laws applied to visual binary stars and eclipsing binary stars.

Stellar radii computed from $L = 4\pi R^2 * \sigma T^4$; measured using eclipsing binary stars.

Stellar Lifetime computed using theoretical models; estimated from Lifetime = mass / luminosity

Chemical composition: of star's atmosphere found from spectrum; of star's interior from theoretical models.