

1. If we made a color-magnitude diagram of all nearby stars using apparent magnitude instead of absolute magnitude it would be a scatter plot with no clear patterns. Why is it ok in this case to use apparent magnitude to make the color-magnitude diagram?

**Since these stars are part of a cluster, they are all at roughly the same distance from us. This means that any apparent brightness variations among these stars are real, intrinsic differences rather than a result of the stars being at different distances.**

2. Why do we have to make measurements of magnitudes in two different filters for each star? Wouldn't one filter be enough?

**One magnitude measurement per star would be enough if we only needed to know about the brightness of the star; but we also need to know about the temperature of the star (for the horizontal axis of the HRD). The easiest way to get this information is from the color index, which is a comparison of the relative brightnesses of the star in two different colors (aka, filters).**

3. What happens when you turn the tracking off? Why?

**The stars drift by from East to West because the Earth keeps spinning on its axis. The tracking motor on a telescope rotates the telescope at the correct speed to exactly compensate for this (if you're lucky!).**

4. Based on your graph, is a star with B-V of -0.2 hotter or cooler than a star with B-V of +1?  
**hotter**

5. Based on your graph, identify (by star number) three possible red giant stars in the Pleiades.

**14**, **16**, **17** (stars in the upper right corner)

6. What is the distance modulus you have measured?  $m - M =$  anywhere from about 4.5 to 6.5 is ok.

7. What is the distance to the Pleiades cluster?  $d =$  79 to 200, respectively pc.  
(The official value is 135 pc.)