# HOMEWORK #12 (due start of class February 19)
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## LEARNING GOALS:
1. Continue recording observations in your journal.
2. Use the tools you either built, or were provided, to observe environment.
3. Read about two new phenomena relating to light sources in our environment.
4. Apply the angular resolution you measured for your eye to known double-stars in the sky.

## TO RECEIVE FULL CREDIT:
1. If you submit multiple pages, staple them together.
2. To receive any credit on these problems, you must **show how** you derived your answer by writing all the logical steps that led you to it.
3. All sentence responses must be **typewritten and in complete sentences**. You may handwrite any arithmetic. Use good English grammar.
4. **If you work more than three hours on this assignment, you should stop, record your work here, and contact Dr. McCarthy.**
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**1. Keep observing the sky (day & night)** and record notes, pictures, and measurements in your journal.
Dr. McCarthy has posted a new link, describing journal content and requirements, on our Web site. Stay up-to-date!

**2. Bring your paper spectrometer kit to class.**
We will assemble the device during class.

**3. Read about "Crepuscular and Anti-crepuscular Rays":**
> http://blogs.discovermagazine.com/badastronomy/2011/11/02/crepuscular-rays-are-parallel/#.XGWQ6817nb0
> https://earthsky.org/earth/how-to-see-anticrepuscular-rays

**4. Listen to a video about "Fraunhofer absorption lines":**
> https://www.youtube.com/watch?v=cgV2OnKdzHk

## 4. Question:
Here's a followup about the resolution of your eye and the measurements you made during Monday's class. You measured the number of millimeters of spacing you could see on an eye chart from a certain distance. Let's call that number you measured (#mm).

Here's a formula to convert your measurements into "angular resolution."
Angular resolution = $(206265 \times \#mm) / (1.31 \times 10^4)$ in units of arcseconds

Several famous double (aka, binary) stars are visible to the human eye. For example, the star Mizar is the second star in the handle of the Big Dipper and located at a distance of 80 light-years. It has a companion star (Alcor) with an angular separation of 11.8 arcmin. Mizar itself is double with a separation of 14 arcseconds between Mizar A and Mizar B.

Based on the angular resolution you measured for your eye during Monday's class, would you expect to resolve either of these double star systems? Why or why not? If not, how much magnification would you need to resolve them?