

GREAT World Wide STAR COUNT

A Windows to the Universe
Citizen Science Event
www.windows.ucar.edu/starcount

October 20 –November 3, 2008

Activity: How Many Stars Are You Missing?

Based on "Calculating Stars Lost" by Fred Schaaf in *Seeing the Sky*, John Wiley & Sons, 1990

In order to complete this activity you will need to determine your local limiting magnitude by observing Cygnus or Sagittarius as described in the prior pages.

By now you know that the number of stars visible is affected by the quality of the night sky. The Moon, atmospheric conditions, and light pollution can make it hard or impossible to see the fainter stars. You have also probably discovered that astronomers use the **magnitude scale** to measure the brightness of stars. Remember that magnitude 1 stars are brighter than magnitude 2 stars, which are brighter than magnitude 3 stars, and so on.

As part of the Great World Wide Star Count, you have learned to measure the **limiting magnitude** of your night sky, that is, what are the dimmest stars that can be seen? Under perfect conditions—no Moon, clear skies, and far, far away from any lights, the human eye can see stars down to about 6th or 7th magnitude. According to the table below, that's about 14,000 stars!

Limiting Magnitude	Approximate Number of Stars Visible
1	6
2	45
3	150
4	540
5	1,700
6	4,900
7	14,000

Now you are ready to calculate how many stars you are missing at your location. All you have to do is subtract the approximate number of stars visible from your location from 14,000. For example, if you measured your limiting magnitude to be 3, you can see about 150 stars with the naked eye, but you are missing around 13,850 stars ($14,000 - 150 = 13,850$)!

Questions:

1. What do you think the result would be if you took a measurement closer to the nearest town or city? How about farther away?
2. Try taking a measurement as soon as stepping outside, followed by another in 15 minutes—using the table above, how many more stars can you see after your eyes adapt to the dark?