Astronomy 101U Skylab #6 – "That thing is supposed to be a bear?!"

Introduction: Many Astronomy students wish to learn the constellations. Here is your opportunity both to learn and get credit for a skylab. You will also see how stars move through the sky on paths that may surprise you.

Equipment: See Skylab #1 for list. Plus you'll need a simple homemade quadrant (see below for an example).

Time Required: One entire, clear night.

What to Do: On a clear dark night, preferably away from city lights (if the weather cooperates, pick a night near New Moon), begin by finding the North star, Polaris. Look in the northern half of the sky about 45 degrees above the horizon. Polaris is located at the end of the handle of the Little Dipper (part of Ursa Minor). Use your home-made quadrant to measure its altitude above the horizon. Now use your star chart to pick out at least four constellations and memorize what they look like. Pick on prominent star in each constellation and measure its altitude above the horizon. You may need a friend's assistance to do both sighting and reading simultaneously. Repeat this process every hour or so, recording the time and elevations of the stars. Mark on your star chart your rough estimate of how each star moved over the past hour relative to its initial orientation.

Between measurements, try learning a few more constellations. The final step (the next day, after sleeping) is to prepare a graph showing the elevations at each hour through the night.

Questions:

(1) Why do some stars change elevation more than others? Give two reasons and use a diagram if that would help make it easier to explain.

(2) How do all the stars move relative to Polaris? Up? Down? Clockwise? Sketch it or show it on your star chart.

(3) Do all the stars move from East to West? Use your chart to explain your answer.

(4) What causes a star to twinkle? Does the amount of twinkling a star does change through the night? What factors would contribute to any change in twinkling (give at least two)?

[Diagram of a simple quadrant omitted from LaTeX version.]