

Name _____

Section _____

Partner(s) NONE

Date _____

CHARTING THE HEAVENS USING A STAR CHART

How do you know if a particular star or constellation (group of stars) will be up in the sky on a certain night?

A star chart is a simple device which allows you to determine which stars or constellations are visible at particular times of the evening. The rising and setting times of stars and constellations can be determined. Your instructor will go through questions 1-5 with you in class.

Use the star chart to answer the following questions:

1. Label north, south, east, and west on the THE NIGHT SKY to the right as they appear on the star chart. Are east and west in the positions you expect with respect to the north? Explain.



Hold the star chart over your head with north on the chart pointing to the north. Are east and west where you expect them?

What does this mean about how you are expected to use the star chart?

2. What part of the star chart defines the horizons? These are your limits of viewing.
3. Locate and label the position of Polaris, the North Star, on the THE NIGHT SKY above. What is important about this point?

4. Where is the zenith on the star chart? Label it on the THE NIGHT SKY above.

The remainder of this activity is to be completed independently and turned in for grading.

5. Remember the activity you did with spherical surfaces and projections. Will you expect the pattern and position of constellations on the star chart to exactly match the display you will see in the sky? Explain why or why not.

6. The star chart is set to work in a range of latitudes. The chart you are using is exact at 40°N latitude, which is the latitude of Maryland's northern border. From the "north" mark on the star chart, determine the number of degrees between the horizon and Polaris.

How is this related to the latitude where the star chart is exact?

In Largo our latitude is approximately 39°N . How far above the northern horizon would you expect to find Polaris?

If you were at the north pole of the Earth, would this star chart give you an accurate representation of the night sky? Why or why not?

7. Set the chart for 15 December at 9:00 pm by holding the stationary portion of the chart, turning the sky dial until your time of night lines up with the observing date. Any object in the oval opening is visible at the position for the date and time. Use this setting to answer the following questions.
 - a. Find the constellation Pegasus. In which direction in the sky would you look to find it?

 - b. Locate and list a constellation that is rising.

 - c. Locate and list a setting constellation.

- d. What constellation is at your zenith?
- e. Find the constellation Orion. What is the declination or location of Orion's belt?
- f. Sirius is the brightest star in the night sky. In which constellation is the star Sirius?

What are the declination and right ascension of Sirius?

At what time will Sirius rise?

At what time will Sirius set?

8. Set the star chart for 10:00 pm on 4 July.

a. Locate a constellation which is

at the zenith _____

rising _____

setting _____

b. The answers above are for summer. Would you get the same constellations in winter? Explain.

c. Is Sirius visible at this time and date?

9. Slowly turn the sky dial or wheel. As you do that notice which constellations are always visible above the horizon. Record the names of three.

1. _____

2. _____

3. _____

The constellations you listed are called **circumpolar constellations** and are visible all the time (assuming it is dark enough).

What line of declination does a constellation have to be above to be a circumpolar constellation?

10. In a total eclipse of the Sun the sky darkens just like at night. Would you see the circumpolar constellations if you were in the path of totality and the eclipse occurred at 12 noon? Explain.

11. Are the planets represented on this chart? Why or why not?