

Constellations and Star Wheels

This is a required exercise worth 40 points toward your final grade. Carefully read the lab and complete the experiment as instructed. If something is not clear, do not hesitate to ask the instructor.

You will use the attached sheets to make a star wheel, and use the star wheel to answer the questions on the next page. Making an adequate star wheel is worth 20 points. After you have made the star wheel, show it to your instructor to earn your points. You get to keep the star wheel for your own use. This lab is due **February 12**.

Making the Star Wheel:

The star wheel comes in two parts: Part 1 is a circular map of the sky, Part 2 is the outer sleeve. Each part for the Star Wheel is sized to fit on a single sheet of letter-size paper. For the sky map (Part 1), trim away the gray corners so that you're left with a circle 8 inches across. For the outer sleeve (Part 2), make sure you keep the large white rectangle at the bottom; also, cut out the white oval in the middle. For better durability, paste both sheets onto a file folder or any other sturdy piece of paper or cardboard before cutting out the parts.

To assemble the star wheel, fold the white rectangle at the bottom of the outer sleeve so it's underneath the front. Then staple the rectangle to the front at the locations marked by short white lines to either side of the oval. Slip in the circular sky map so it shows through the oval. Now you have a star wheel ready to use.

Using the Star Wheel:

Align your date and time. Use the white (top) hours when standard time is in effect and the grey (bottom) hours when clocks are set for daylight-saving time. The star wheel's large oval shows the whole sky, and the oval's curved edge represents the horizon you're facing. Hold the star wheel out in front of you and look at the "Facing" labels around the oval. Turn the entire wheel so that the label for the direction you're facing is on the bottom, with the lettering right-side up. The star positions in the sky should match those on the wheel.

Constellations and Star Wheels

Name: _____

Use Central Standard Time for all questions!

ID: _____

1. Rotate the dial of your star wheel, noting how the map of the stars changes as you spin the dial.
 - a. Which way does the sky appear to rotate during a single night (clockwise or counterclockwise)?
 - b. Which way does the sky appear to rotate as the year progresses (clockwise or counterclockwise)?

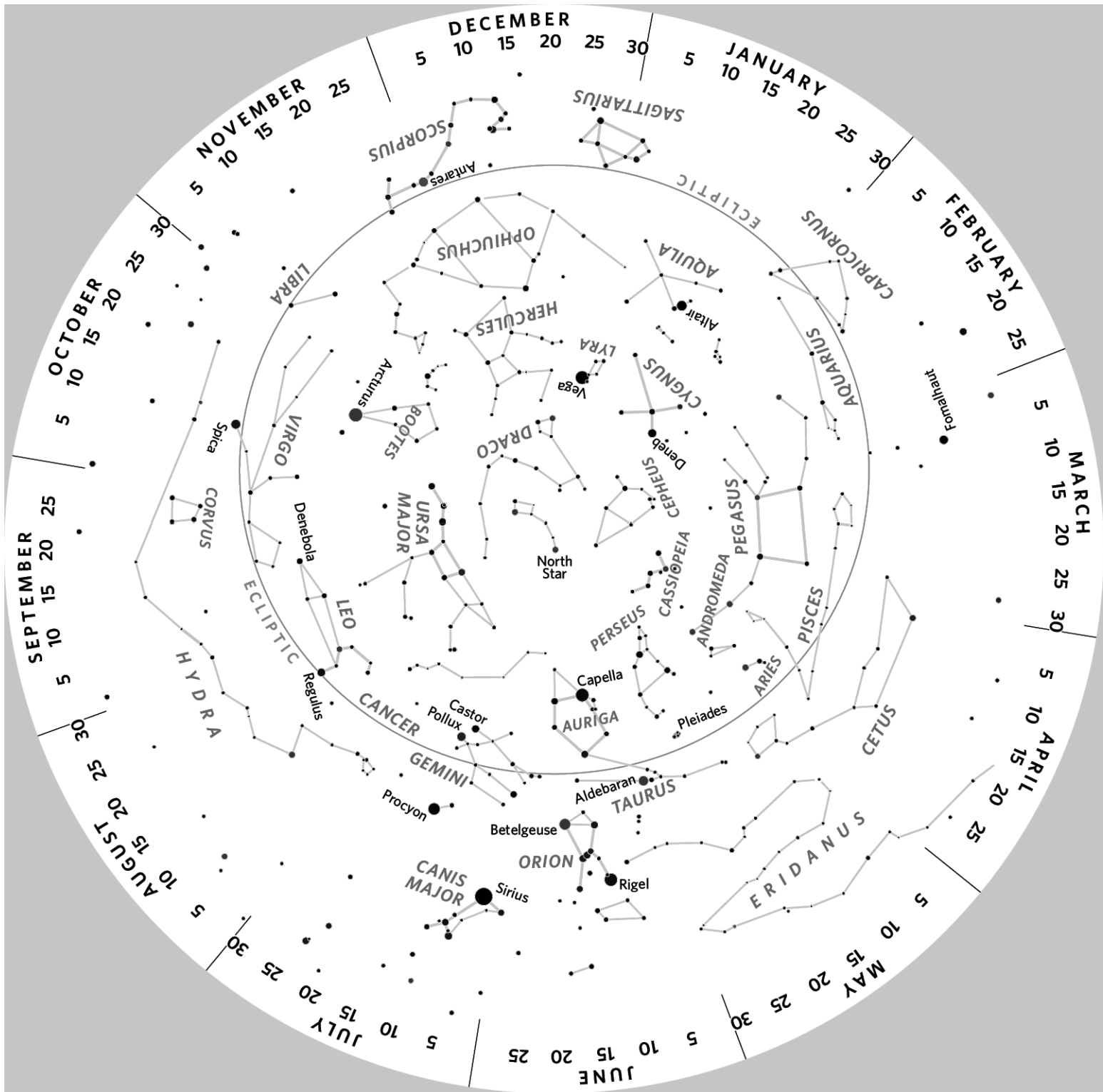
2. Follow a mapped constellation through one complete rotation of the star wheel. Any constellation which never goes completely below the horizon is called circumpolar. Whether or not a constellation is circumpolar depends on the latitude of your observing site. This star wheel is usable for northern latitudes between 30° and 50°. List four circumpolar constellations shown on your sky wheel.

3. About what fraction of a circle do the stars move
 - (a) in 1 hour? _____
 - (b) in 1 month? _____

4. To simulate when the bright star Regulus, in the constellation Leo, will rise above the horizon, dial the star wheel so Regulus is just showing above the eastern horizon.
 - a. When does Regulus rise on Jan 10? _____
 - b. When does Regulus rise on Feb 10? _____

5. On February 10 at around 10 pm which of the following constellations has just risen?
 - a. Andromeda
 - b. Bootes
 - c. Ursa Minor
 - d. Capricornus

6. When does the star Capella (in the constellation Auriga) transit the meridian on the first day of February?
 - a. 2 am
 - b. midnight
 - c. 10 pm
 - d. 8 pm
 - e. 6 pm



STAR WHEEL

Standard time
Daylight-saving time

Facing North

Facing East

Facing West

HORIZON

HORIZON

Facing South

SKY
& TELESCOPE

