

NAME: \_\_\_\_\_ PERIOD: \_\_\_\_\_ DATE: \_\_\_\_\_

LAB PARTNERS: \_\_\_\_\_ LAB #40

## IDENTIFYING CONSTELLATIONS

### INTRODUCTION

Suppose you sat outside on a clear night gazing up at the stars. Imagine that the sky is a dome touching the ground around you at the horizon. The stars are points of light on the dome's curved surface. If you were to view the dome of stars on a regular basis throughout the year, you would notice that the stars move. Like the sun's motion, the star's apparent motions in the sky are caused by the daily rotation of Earth on its axis and the yearly revolution of Earth in its orbit around the sun.

### OBJECTIVES

1. To locate several stars and constellations on star maps.
2. To analyze the apparent motions of the stars and constellations over the seasons.

### MATERIALS

Colored pencils

APPROXIMATE TIME 2 periods

### PRODEURE

Label the constellations in red and the *stars* in blue (they are *italicized* in the reading)

### JUNE SKY CHART

1. Locate the Big Dipper (if you need help let me know. This is the only constellation that I will identify for you.) **Label the Big Dipper.**
2. Use the pointers stars of the Big Dipper to find Polaris (North Star) by doing the following: Draw a mental line through these stars (the end of the bowl part) to the first star you encounter, thi is Polaris. It is the end star in the Little Dipper. **Label the *star Polaris* and the Little Dipper**
3. "Snaking" between the Little Dipper and the Big Dipper is the Draco the dragon. **Label Draco.**
4. Imagine taking the Big Dipper by the handle and slamming its bowl onto the head of Leo the lion. The brightest star in this group is Regulus, the "dot" of the backward question mark that traces the lion's mane. **Label the *star Regulus* and Leo.**
5. Follow the arc of the Big Dipper's handle away from its bowl. The first bright star you encounter along that arc beyond the handle is Arcturus in Bootes, which resembles a kite. **Label the *star Arcturus* and Bootes**
6. Follow the arc further past Bootes to the bright star Spica in Virgo, which resembles the letter Y. **Label the *star Spica* and Virgo**

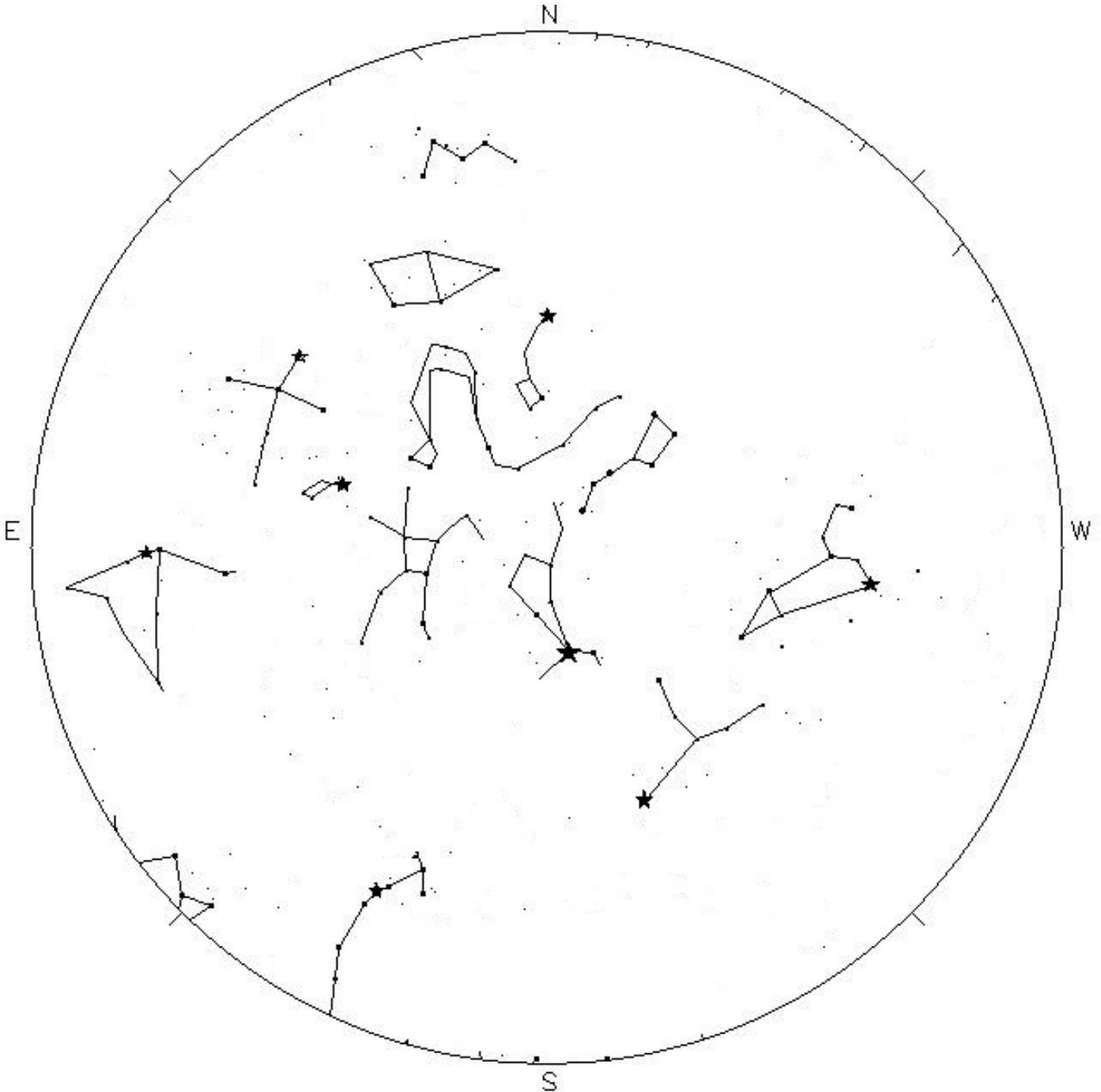
7. Go back to the pointer stars in the Big Dipper. Remember how you drew a mental line from the pointer stars to find Polaris? Extend this line through Polaris and you will come to Cepheus, the King, and a small constellation resembling a house or a crown. **Label Cepheus.**
8. Above Cepheus is the queen, Cassiopeia which sometimes looks like an M, and at other times a W. **Label Cassiopeia.**
9. Draw a mental line from the bowl in the Big Dipper through the head of Draco until you reach a large “cross.” This is Cygnus the swan. The brightest star is Deneb. **Label the star Deneb and Cygnus.**
10. Just to the side of Cygnus is a small constellation called Lyra, the harp, whose brightest star is Vega. **Label the star Vega and Lyra.**
11. Between the two bright stars, Arcturus and Vega, lies the hero of the night sky Hercules. Hercules slays Draco the dragon and looks like a stick figure. **Label Hercules.**
12. If you draw a mental line from the bowl in the Big Dipper through the head of Draco, through Lyra, you will come to a triangle group of stars which forms Aquila, the eagle, whose brightest star is Altair. **Label the star Altair and Aquila.**
13. Connect Vega, Deneb and Altair with a dashed line. This is known as the summer triangle.
14. Low above the southern horizon is a T-shaped group of stars forming Scorpius, the scorpion, whose brightest star is Antares. **Label the star Antares and Scorpius.**

## DECEMBER SKY CHART

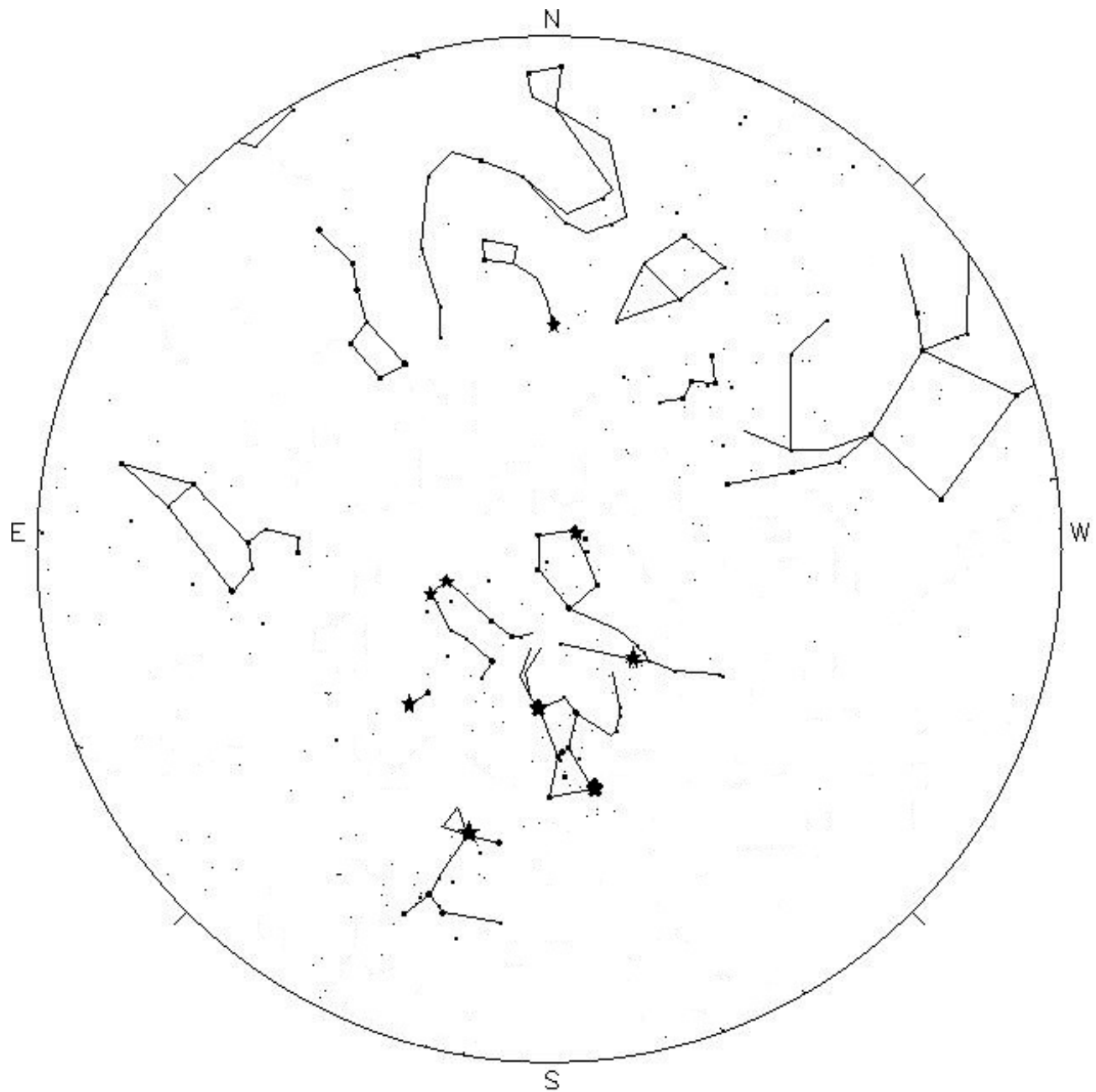
1. Stars which are near the north celestial pole are visible every season of the year and are known as the circumpolar constellation. They include the Big and Little Dippers, Draco, Cassiopeia, and Cepheus. **Label these constellations on the December star chart using the June star chart as a guide.**
2. Lying near the center of the night sky chart are two constellations which are connected. Auriga is a large, 5 sided polygon whose *brightest star is Capella*. It is connected to a long, V shaped group of stars called Taurus, which contains the *bright star Aldebaran*. **Label Auriga, Taurus, the stars Capella, and Aldebaran.**
3. Draw an imaginary line from Polaris through Capella and Taurus. This will bring you to Orion, the Hunter. This constellation is best known for its three stars in a row, forming Orion’s belt. The upper bright *star is Betelgeuse*; the lower brighter *star is Rigel*. **Label Orion, the stars Betelgeuse, and Rigel.**
4. Draw an imaginary line following Orion’s belt to the left. This will bring you to *Sirius*, in Canis Major. **Label the star Sirius and Canis Major.**
5. Draw an imaginary line between Betelgeuse and Sirius. Draw a second imaginary line, perpendicular to this line, halfway between Betelgeuse and Sirius, upward. This will bring you to the constellation Canis Minor and its bright *star Procyon*. **Label Canis Minor and the star Procyon.**

6. Lying between Procyon and Capella is the bottom of the constellation Gemini, the Twins. The two bright stars are the brothers whom this constellation represents. *Pollux is in the upper left, Castor the upper right.* **Label Gemini, the stars Castor and Pollux.**
7. Draw a mental line from Polaris, through Cassiopeia and beyond. This will take you to the great square of Pegasus, the flying horse. Attached to Pegasus is a V shaped constellation, which represents the flowing hair of Andromeda who is riding Pegasus. **Label Andromeda and Pegasus.**

## JUNE SKY CHART



## DECEMBER SKY CHART



### LABORATORY QUESTIONS:

1. What motion of the Earth causes different constellations to be visible during different seasons?

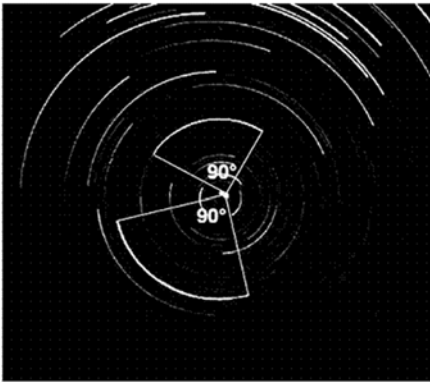
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2. Find the Big and Little Dippers, Draco, Cassiopeia, and Cepheus on the December sky chart. **Then** find those constellations on the June sky chart. In what direction (clockwise or counterclockwise) have these constellations moved from December to June?

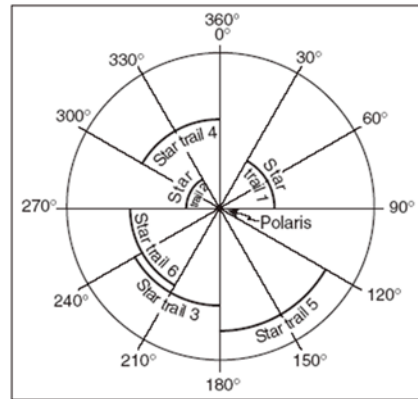
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3. What motion of the Earth causes these star trails in a single night?

For each star trail calculate how many hours the camera was exposed for:



\_\_\_\_\_ hrs



\_\_\_\_\_ hrs

4. Name the constellation in which each of the following stars is located:

Polaris \_\_\_\_\_

Antares \_\_\_\_\_

Vega \_\_\_\_\_

Spica \_\_\_\_\_

Betelgeuse \_\_\_\_\_

Rigel \_\_\_\_\_

Arcturus \_\_\_\_\_

5. For each constellation listed in the Data Table place an X if it is located on the June and/or December maps.

Data Table		
Constellation	December	June
Bootes		
Lyra		
Orion		
Big Dipper		

6. Explain why the position of Polaris does not change relative to the northern horizon during the year.

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7. Identify the star located in the center of the star chart below: \_\_\_\_\_

8. On the chart of the night sky below, place an X to indicate the location of the Big Dipper at the same time of night 6 months later:

