

<p style="text-align: center;"><b>Finding Stars and Constellations</b> Earth &amp; Sky</p>
------------------------------------------------------------------------------------------------

Name: \_\_\_\_\_

**Introduction**

If you carefully watched the night sky over a period of time, you would notice that it's not always the same. There are certain changes that take place over both the course of a night and a year. Tonight you'll investigate some of these changes.

**Pre-test**

Think about the following questions, then write down a **yes** or **no** for each one.

1. Are there any stars that can be seen from Sydney, Australia that cannot be seen from Troy, NY?
  
  
  
  
  
  
  
  
  
  
2. Are there any stars that can be seen from Troy, NY in September that cannot be seen from Troy, NY in March?
  
  
  
  
  
  
  
  
  
  
3. Are there any stars that can be seen early in the night tonight, but not later in the night?
  
  
  
  
  
  
  
  
  
  
4. Are there any stars that can be seen from Troy, NY at any time of night, any day of the year?

## Using the planisphere

In this activity you will be using a *planisphere* to investigate the appearance of the night sky. A planisphere is a circular map of the night sky with a rotating window on top. You should notice that the planisphere has a latitude given on it. The planisphere is valid only for locations near that latitude. (The latitude of the observatory is  $42^{\circ}43'42''$  N.) Try rotating the window — you should notice alignment markings along the edge. On one side are dates, and on the other are times. The view of the sky in the planisphere window should be accurate for any date and time you can read off along the edge. Set the planisphere to the current date and time. If Daylight Savings Time is still in effect (i.e., you haven't set the clocks back yet), remember to subtract an hour from your current time.

Write down the date and time you are using: \_\_\_\_\_

The planisphere window represents the whole night sky you can see at the set time and date, with the edges of the window representing the horizon. The lines that radiate from the center mark right ascension (celestial longitude), and the curving lines mark declination (celestial latitude). The constellations, bright stars, and some other objects are labeled. Hold the planisphere above your head and orient the compass directions marked on the planisphere's horizon. When you're on the J-ROWL roof, the observatory dome is roughly due south, and the penthouse is roughly due north. The sky above your head and the sky in the planisphere window should match.

When you're looking south, you may want to use the back side of the planisphere, which shows the south with less distortion.

## Change over the night

Set the planisphere so that it shows the sky three hours later tonight.

1. The stars in which direction went below the horizon?

2. The stars in which direction rose above the horizon?

3. How does the motion of the stars compare with that of the Sun?

4. Do some stars move more than others?

5. Which star does not move at all?

### **Change over the year**

Now set the planisphere for the current time but six months from tonight.

6. Give an example of a constellation that is visible tonight but not six months from now.

7. Give an example of a constellation that is visible six months from now but not tonight.

8. Give an example of a constellation that is visible both tonight and six months from now.

9. At what time of day, sixth months from now, would you be able to see the same part of the sky you're observing now?

10. Can you see stars at that time of day?

### **The limits of visibility**

You should now have an idea of how the sky changes over the course of a night as well as the year.

11. What is the lowest declination you can see tonight?

12. Can you see lower declinations at other times of the year?

13. Where would you have to go to see lower declinations?

