

Name: _____

Solar System

Date: _____ Period: _____

Earth Science

Lab Activity: Apparent to Actual Motions

INTRODUCTION:

Many times you have observed the Sun rising in the morning, moving across the sky during the day, and setting in the evening. You must realize, however, that this is only an apparent motion. The real motion of Earth's rotation is responsible for this apparent motion of the Sun. In this lab you will examine this apparent motion of the Sun more closely and look for evidence of change.

OBJECTIVE:

You will learn how the Sun's path changes on the celestial sphere during the period of one year.

VOCABULARY:

Horizon -

Altitude -

Azimuth -

Solstice -

Equinox -

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PROCEDURE:

1. Place the transparent hemisphere onto the azimuth template.
2. Be sure to place a mark onto the hemisphere at the north, east, south, and west directions.
3. Using the external protractor and a transparency marker, place the data for the azimuth and altitude of the Sun onto the clear plastic hemisphere.
4. Be sure to connect the points with a line as you move along.
5. After you have completed one line be sure to date it before you move on to the next date.
6. Finish placing all the points on the hemisphere for the remaining dates given before moving on.

June 21 st		
Time	Azimuth	Altitude
5:00	60°	0°
7:00	73°	16°
9:00	91°	39°
11:00	117°	60°
13:00	184°	73°
15:00	246°	59°
17:00	271°	36°
19:00	290°	16°
21:00	300°	0°

March 21 st		
Time	Azimuth	Altitude
7:00	90°	0°
9:00	113°	25°
11:00	142°	43°
13:00	185°	50°
15:00	225°	40°
17:00	252°	20°
19:00	270°	0°

December 21 st		
Time	Azimuth	Altitude
8:00	120°	0°
10:00	152°	20°
12:00	182°	25°
14:00	211°	20°
16:00	240°	0°

September 21 st		
Time	Azimuth	Altitude
7:00	90°	0°
9:00	113°	25°
11:00	142°	43°
13:00	185°	50°
15:00	225°	40°
17:00	252°	20°
19:00	270°	0°

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REPORT SHEET

June 21

Total degrees that the Sun's path takes: _____

Time the Sun takes to move through its path: _____

Calculate the rate at which the Sun appears to move across the sky: _____

Do calculations here:

December 21

Total degrees that the Sun's path takes: _____

Time the Sun takes to move through its path: _____

Calculate the rate at which the Sun appears to move across the sky: _____

Do calculations here:

March 21

Total degrees that the Sun's path takes: _____

Time the Sun takes to move through its path: _____

Calculate the rate at which the Sun appears to move across the sky: _____

Do calculations here:

September 21

Total degrees that the Sun's path takes: _____

Time the Sun takes to move through its path: _____

Calculate the rate at which the Sun appears to move across the sky: _____

Do calculations here:

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DISCUSSION QUESTIONS:

1. How is the amount of daylight related to the Sun's apparent path?
2. According to your calculations, what is the rate the Sun appears to move across the sky?
3. At the rate determined in question 2, how many hours would it take the Sun to travel 360° ?
4. What day[s] does the Sun rise directly in the east and set directly in the west.
5. Describe how the angle of sunlight changes from December 21 through June 21?

CONCLUSION: Describe how the Sun's apparent path across the sky changes over a year?

AZIMUTH TEMPLATE

