

Name \_\_\_\_\_

Date \_\_\_\_\_ Per \_\_\_\_\_

## Solar Motion Lab

### ***How the Solar Motion Demonstrator models the Sun and the Earth:***

- The “green Horizon Disk” represents a piece of the surface of the Earth. You can imagine a tiny observer (represented by the black dot in the center), able to look out at the horizon in any direction, including North, East, South, and West.
- The round head of the brass paper fastener represents the Sun.
- The swinging “Month” arm of the Frame has two functions. Setting the Sun marker at the desired month adjusts for the time of the year. Swinging it from one side to the other (preferably East to West) moves the Sun in its apparent daily path over the Earth.
- The “Latitude” part of the Frame is used to adjust the Horizon Disk to set the imaginary observer at any latitude from the Equator ( $0^\circ$ ) to the North Pole ( $90^\circ$ ).

### ***Procedure***

1. Align the green Horizon Disk to  $10^\circ$  N Latitude for Caracas, Venezuela.
2. Carefully slide the brass fastener to the Summer Solstice (June).
3. Fold the swinging arm back and release it slowly to observe the location of the sunrise (east) and sunset.
4. Carefully slide the brass fastener to each of the other months.
  - a. What happens to the location of the sunrise and sunset?
  - b. How does the length of the day change throughout the year?
  - c. After viewing all four months Record your observations on the box.
5. Carefully align the Disk (green) to the proper latitude for the remaining cities listed below.
6. Repeat steps 2-5 for the remaining cities.

### ***Data Table***

For each city, observe a) the location of the sunrise and sunset and; b) how the length of day changes throughout the year.

<u>City</u>	<u>Latitude</u>	<u>June</u>	<u>September</u>	<u>December</u>	<u>March</u>
Caracas, Venezuela	10° N	a) b)	a) b)	a) b)	a) b)
Monroe, NJ	42° N	a) b)	a) b)	a) b)	a) b)
Oslo, Norway	59° N	a) b)	a) b)	a) b)	a) b)
Arctic Circle	75° N	a) b)	a) b)	a) b)	a) b)

1. How does the length of day change with the seasons?
2. At what latitude must you be, so the Sun does not set on the longest day of the year (the summer solstice)?
3. What would the Sun's motion look like if you lived at the North Pole?