The Earth's Diurnal Motion –Exercise

Student Name: _____

Step 1.

A. Start Stellarium. It should be in the default configuration you setup in the Using Stellarium exercise. You should be viewing to your South and set the program to full screen.
B. Bring up the Location Window and make sure you are set to your default location.
C. For this exercise, set the date/time to 2014-12-21 13:00:00 Local Time. This is the approximate December Solstice (Winter Solstice for the Northern Hemisphere).
D. Set you view to the South with a FOV of about 50°. This should mean that East is to your left and West is to your right.
E. Move the horizon so it is just visible at the bottom of the screen and you are still facing south.
F. Turn the atmosphere ON and select the Sun.

Step 2.

G. Now we will examine the apparent movement of objects in the sky over a period of a few hours. While watching the movement of the Sun. Use the Date/Time Window to increase the hours by one hour at a time, two or three times.

    - **Question 1:** As you increased the time of day, in which compass direction did the Sun move? _____

H. Move the time back to 2014-12-21 13:00:00 Local Time.
I. Now watch Venus and the Moon, and increase the hours three times.

    - **Question 2:** In which compass direction did Venus and the Moon move? _____
    - **Question 3:** Did either Venus or the Moon seem to move at a different rate than the Sun? _____

J. Move the time back to 13:00:00 Local Time and turn the atmosphere off.
K. Now watch the stars and constellations, click three times on the up arrow to change the hours in the Date/Time window.

- **Question 4:** Did any object seem to move at a different rate than the Sun? _____

L. Move the time back to 13:00:00 Local Time. Turn the Atmosphere off.
M. Now let's observe the motion as we look to the North. Find the object Polaris. Now looking North, East is to the right and West is to the left.
N. By chance, Polaris lies very close to the celestial pole, an extension of the Earth's axis from the North Pole.
O. Watching the stars and constellations, click three times on the up arrow for the hours in Date/Time Window.

- **Question 5:** Does the sky appear to move clockwise (cw) or counter-clockwise (ccw)? _____
- **Question 6:** Do the stars and constellations maintain their relative positions to one another? _____

Step 3.

P. Now we will examine how the apparent movement of objects in the sky change as we look from different latitudes on the Earth.
Q. Set the date/time to 2015-03-21 07:40:00 Local Time. This is the approximate Vernal Equinox, just about sunrise. Drag the horizon until you are facing due East, with the horizon at the middle of the screen.
R. While watching the movement of the Sun, click three times on the up arrow for the hours in Date/Time Window.

- **Question 7:** As you increased the time of day, Use a small plastic protractor and carefully estimate the angle between the Sun's path and the horizon. Record the angle here:

  _____

S. Using the Location Window, set your latitude to 0.00° and move the time back to 07:40:00 Local Time. Adjust the horizon to about the middle of the screen.
T. Watch the Sun again, and click two times on the up arrow for the hours in Date/Time Window.

- **Question 8:** Again, use a small plastic protractor and carefully estimate the angle between the Sun's path and the horizon. Record the angle here: _____

U. Reset your location to the North Pole by opening the Location Window and using the up arrow on the latitude to get to 89 + degrees north, and move the time back to 07:40:00 Local Time.
V. Turn the Atmosphere OFF.
W. Watch the Sun again, and click two times on the up arrow for the hours in Date/Time Window.

- **Question 9:** Again, if needed, use a small plastic protractor and carefully estimate the angle between the Sun's path and the horizon. Record the angle here: _____
- **Question 10:** What differences if any did you notice?

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