

EARTH, MOON, SUN AND SEASONS

Work Date: ___/___/___

LESSON OBJECTIVE

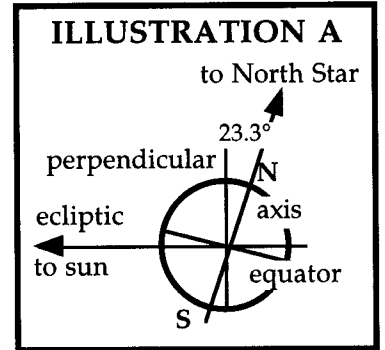
Students will explain the cause of earth's seasons.

Classroom Activities

On Your Mark!



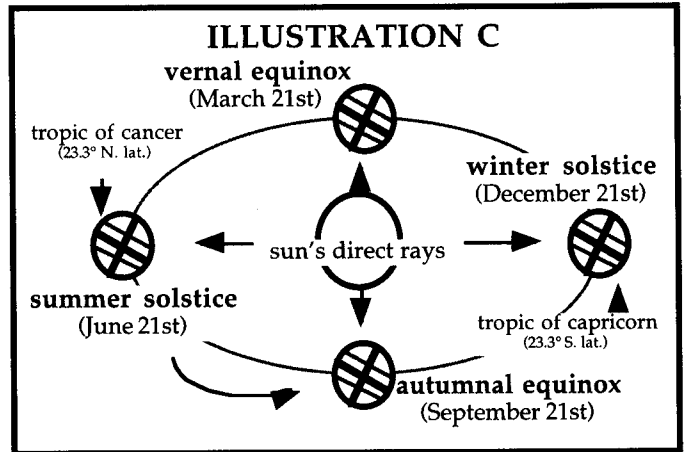
Begin discussion with a review of the causes of the weather and changes in earth's climate introduced in Units #7, #8, and #9. Remind students that the sun is the primary engine that drives changes in our atmosphere by heating the varied surfaces of the earth differentially. Draw Illustration A on the board and have students copy your drawing on Journal Sheet #2. Define the term **ecliptic** as a "horizontal plane, parallel to the imaginary floor of the universe, around which the earth orbits the sun." Note that our planet's axis is tilted 23.3° from the perpendicular to the ecliptic. Point out that the earth "wobbles" slightly on its axis like a spinning top that is slowing down. But for now, the North Pole is pointed toward the North Star. In the year 14,000 A.D., the earth's axis will point toward the star Vega in the constellation Lyra (e.g., small harp).



Get Set!



Draw Illustration C and have students copy your drawing on Journal Sheet #2. Point out that the sun's direct rays hit different parts of the earth at different times of the year. The earth remains tilted toward the North Star throughout its revolution of the sun. At **winter solstice** in the Northern Hemisphere, the most direct rays of the sun hit the **tropic of capricorn** in the Southern Hemisphere. At **summer solstice** in the Northern Hemisphere, the most direct rays of the sun hit the **tropic of cancer** in the Northern Hemisphere.



At the **vernal** and **autumnal equinoxes** both hemispheres receive the same amount of direct sunlight. Seasons in the Northern and Southern hemispheres are, therefore, reversed.

Go!



Give students ample time to perform the activity described in Figure B on Journal Sheet #2. The student's graphs of temperature readings will show that the thermometer in direct line with the heat of the desk lamp warms more quickly.

Materials

desk lamp, ringstand and clamps, tape, thermometers

EA11 JOURNAL SHEET #2

EARTH, MOON, SUN AND SEASONS

Large grid area for student work.

FIGURE B

Directions: (1) Tape 3 thermometers together as shown. (2) Attach the thermometers to a ringstand and position the desk lamp as shown. (3) Turn on the desk lamp and record the thermometer readings every 30 seconds for the next ten minutes. (4) Plot the temperature readings and connect the readings to form a line graph for each thermometer. (5) Explain the difference in the slopes of each line.

