The Reasons for the Seasons

Angle and Daylight hours

1. Get your Graph of Daylight Length and Angle of the Sun. If you don't have one, share with someone at your table.
2. Complete the blanks with numbers or months from the Daylight Length and Angle of the Sun graph.
   a. The amount of daylight is shortest during December (month) when the Sun angle is 29 degrees.
   b. The amount of daylight is longest during June (month) when the Sun angle is 75 degrees.
3. CLAIM: Re-read number 2 a & b. Write down one sentence describing the relationship between the amount of daylight and angle of the Sun.

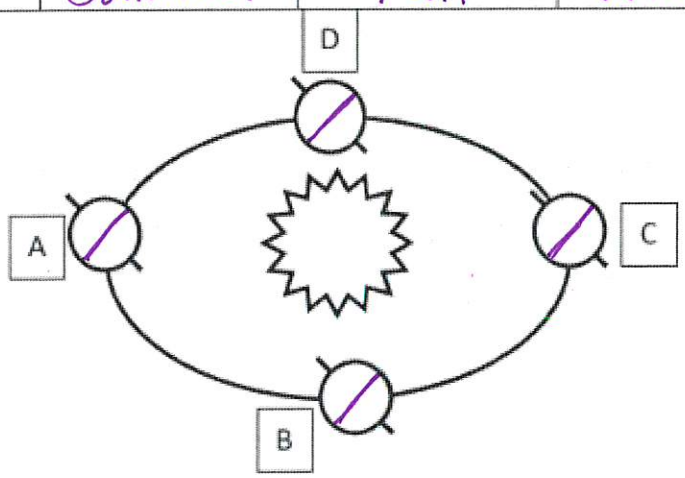
   The amount of daylight is dependent on and determined by the angle of the sun. The higher the angle, the more daylight hours there are.
4. EVIDENCE: Evidence is data or facts. Circle any statement that provides a fact about seasons.
   a. The larger the angle of sunlight, the more daylight per day.
   b. The smaller the angle of sunlight, the less daylight per day.
   c. The longest days are the same month as the lowest angle of Sunlight.
   d. The shortest days are the same month as the lowest angle of Sunlight
5. REASONING: Explain why the statements in number 4 are or are not evidence
   a. This statement **(IS/ISN'T)** evidence because June has the highest angle of 75 degrees and the most daylight hours of 14.8.
   b. This statement is evidence because December has the lowest angle of 29° and the least amount of daylight hours.
   c. The statement isn't evidence because the longest days are in June while the lowest angle of sunlight is in December.
   d. This is evidence because December has both the shortest days and the lowest angle of sunlight.

6. Re-read your claim in number 8. Does the evidence and your reasoning support your claim? Why or why not?

Skip

Fill in the season that is being experienced at each point. Assume that the North Pole is on top.

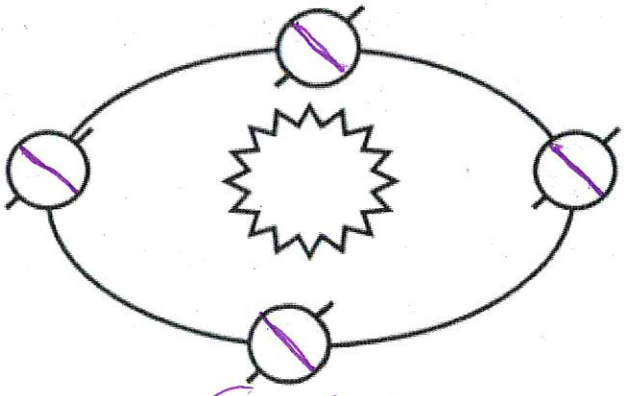
Hemisphere	Point A	Point B	Point C	Point D
North	Winter	Spring	Summer	Fall
South	Summer	Fall	Winter	Spring



7. On the diagram below
   a. Write the name of the season for the SOUTHERN hemisphere in A-D.
   b. Label the season that has the biggest and smallest angle of sunlight.

A. Fall

B. Winter



D. Summer

C. Spring

	Word Bank	
axis	angle (of sunlight)	equinox
energy	daylight (hours)	solstice
equator	tilt	Tropic of Cancer
rotation	sunlight	Tropic of Capricorn
revolution		temperature

Using the expressions in the word bank, fill in the blanks below.

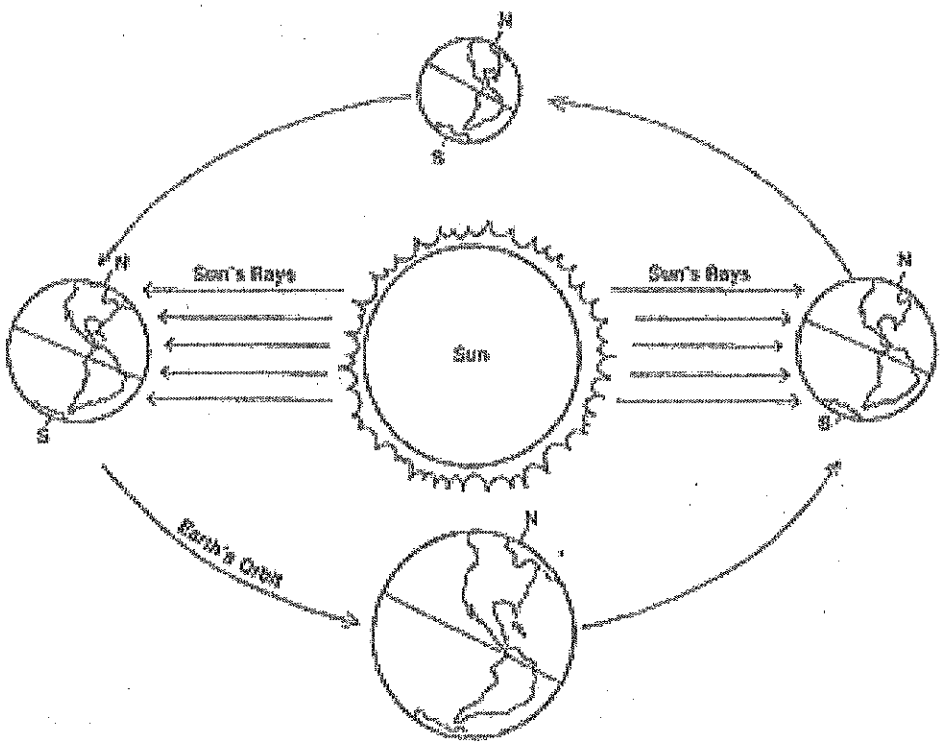
1. Because of the tilt of the Earth's axis, we have seasons.
2. The angle of light hitting the earth affects the number of daylight hours.
3. The hemisphere tilted away from the sun gets less energy from the sun than the other one.
4. At the summer solstice, the sun is at the highest angle in the sky, so there are the most hours of daylight. The temperature is higher because that part of the Earth is receiving a lot of energy from the sun.
5. In order for there to be an equinox, the sun must be directly over the equator.
6. The Tropic of Cancer is the furthest point north that the sun is directly overhead. This happens at the Summer solstice in the northern hemisphere.
7. Because of the Earth being tilted on its axis, the number of daylight hours are always changing. Therefore, the amount of energy hitting the earth is always changing, too.

The Seasons

The cycle of seasons is caused by the Earth's tilt toward the sun. The planet rotates around an (invisible) axis. At different times during the year, the northern or southern axis is closer to the sun. During these times, the hemisphere tipped toward the sun experiences summer, while the hemisphere tilted away from the sun experiences winter.

At other locations in Earth's annual journey, the axis is not tilted toward the sun but instead along the planet's path, parallel to the star. During these times of the year, the hemispheres experience the spring and autumn equinoxes.

The astronomical definition of the seasons relate to specific points in Earth's trip around the sun. The summer and winter solstice, the longest and shortest day of the year, occur when the axis of the Earth is either pointed directly toward or away from the sun. The summer solstice in the northern hemisphere occurs around June 21, the same day as the winter solstice in the southern hemisphere. The south's summer solstice occurs around December 21, the winter solstice for the north. In both hemispheres, the summer solstice marks the first day of astronomical summer, while the winter solstice is considered the first day of astronomical winter.



Equinoxes are another significant day during Earth's journey around the sun. On these days, the planet's axis is pointed parallel to the sun, rather than toward or away from it. All parts of the earth receive about the same hours of sunlight. Day and night during the equinoxes are supposed to be close to equal. The spring, or vernal, equinox for the northern hemisphere takes place around March 20, the same day as the south's autumnal equinox. The vernal equinox in the southern hemisphere occurs around September 20, when people in the north celebrate the autumnal equinox. The spring equinox marks the first day of astronomical spring for a hemisphere, while the autumnal equinox ushers in the first day of fall.

Using the reading and your knowledge, label the season for each hemisphere on the diagram above.