

The Reasons for the Seasons

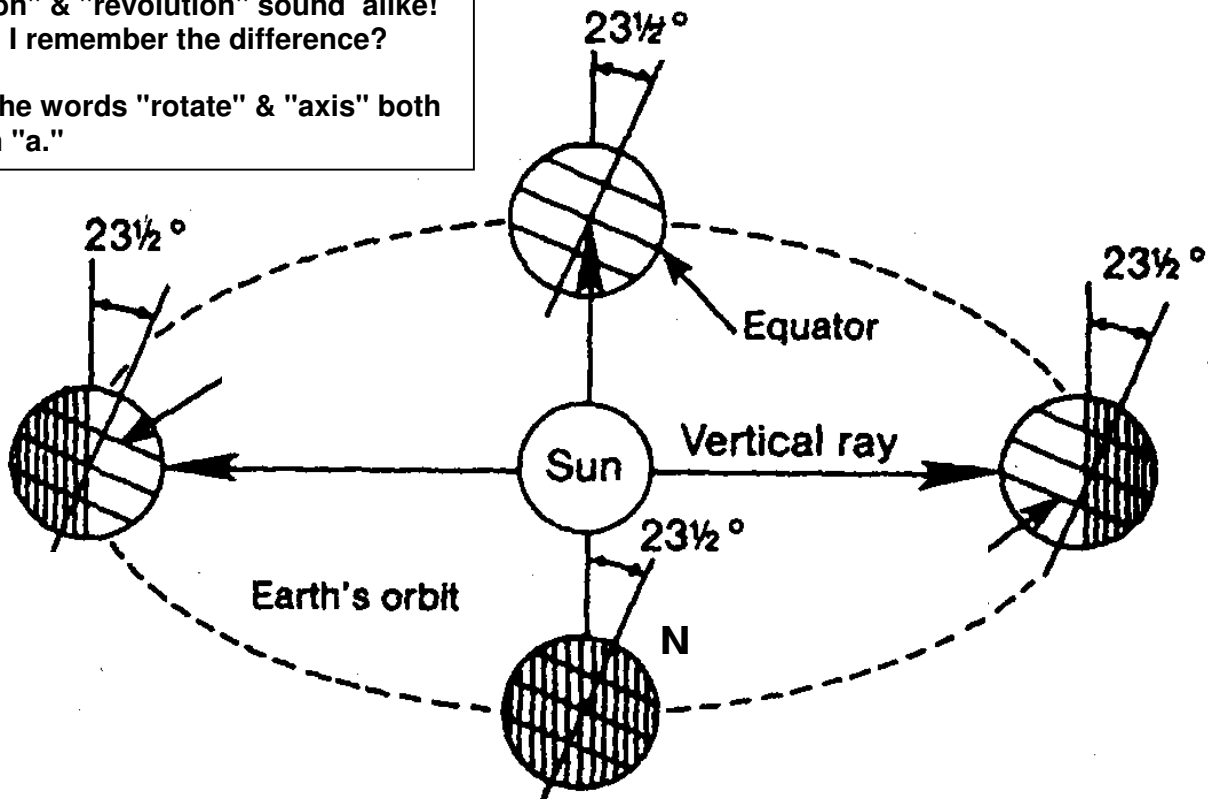
Name _____

Directions: give the best answer to the following questions.

1. The seasonal changes in weather are the direct result of cyclic variations in _____ and _____ of insolation that occur throughout the year.
2. What does the distance from the Earth to the Sun have to do with the change in seasons? _____
3. The 4 factors which cause the changing seasons are 1) _____
2) _____ 3) _____ 4) _____
4. In the diagram below, label the following features and dates:
March 21, June 21, September 23, December 21, Vernal (Spring) Equinox, Summer Solstice, Autumnal (Fall) Equinox, Winter Solstice, Tropic of Cancer, Tropic of Capricorn

"Rotation" & "revolution" sound alike!
How do I remember the difference?

HINT: The words "rotate" & "axis" both
have an "a."



5. The Earth's axis is not perpendicular to its orbital plane, but is tilted _____ degrees.
6. The Earth's axis may be tilted, but it **always** points toward Polaris. In the Northern Hemisphere, the longest day of the year is _____, and the shortest is _____. On the equinoxes (2 per year), **every** location on Earth has a _____ hour day and a _____ hour night!
7. Ballston Spa's latitude of 43° means we get (more / less) insolation than they do at 50° latitude.

8. The diagram below shows the paths of the Sun across the sky on four different days for N.Y.S. At solar noon, the Sun is always at its (highest / lowest) position, and it is always in the (northern / southern) sky.

9. In the Northern Hemisphere, the Sun always travels in broad arcs through the (northern / southern) sky. In the Southern Hemisphere, the Sun travels through the _____ sky.

10. On the equinoxes, the Sun always rises exactly in the _____ and sets exactly in the _____. This is true everywhere on Earth on these two days.

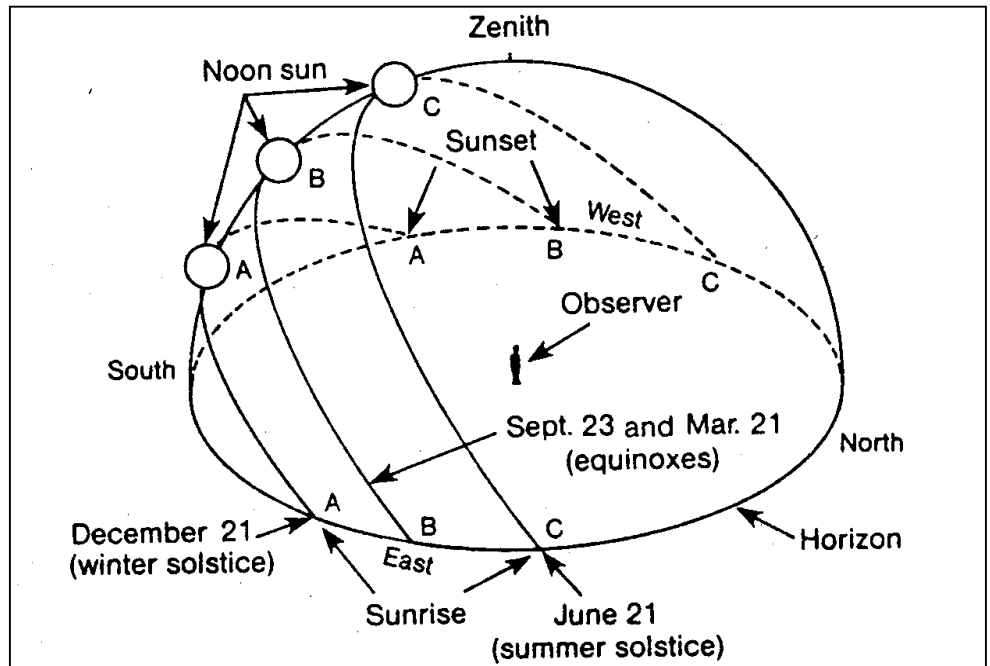
11. In the summer months in N.Y.S., the Sun rises (N / S) of east, and sets (N / S) of west.

12. In the winter months, the Sun rises _____ of east, and sets _____ of west.

13. In N.Y.S., the Sun travels the greatest arc, and is highest in the sky on _____ (date).

14. Color the June 21 path (from C to C) red, the Sept. 23 / Mar 21 path green and the Dec 21 path blue.

15. What's it like at the North Pole during December? _____



Apparent paths of the Sun across the sky throughout the year at Syracuse, New York.

ALTITUDE OF NOON SUN AND DURATION OF INSOLATION

Latitude	December 21		March 21 September 23		June 21	
	Altitude of Noon Sun	Duration of Insolation	Altitude of Noon Sun	Duration of Insolation	Altitude of Noon Sun	Duration of Insolation
90°N	—	0 Hours	0°	12 Hours	23½°	24 Hours
80°N	—	0	10°	12	33½°	24
70°N	—	0	20°	12	43½°	24
60°N	6½°	5½	30°	12	53½°	18½
50°N	16½°	7¾	40°	12	63½°	16¼
40°N	26½°	9	50°	12	73½°	15
30°N	36½°	10	60°	12	83½°	14
20°N	46½°	10¾	70°	12	86½°	13¼
10°N	56½°	11½	80°	12	76½°	12½
0°	66½°	12	90°	12	66½°	12
10°S	76½°	12½	80°	12	56½°	11½
20°S	86½°	13¼	70°	12	46½°	10¾
30°S	83½°	14	60°	12	36½°	10
40°S	73½°	15	50°	12	26½°	9
50°S	63½°	16¼	40°	12	16½°	7¾
60°S	53½°	18½	30°	12	6½°	5½
70°S	43½°	24	20°	12	—	0
80°S	33½°	24	10°	12	—	0
90°S	23½°	24	0°	12	—	0