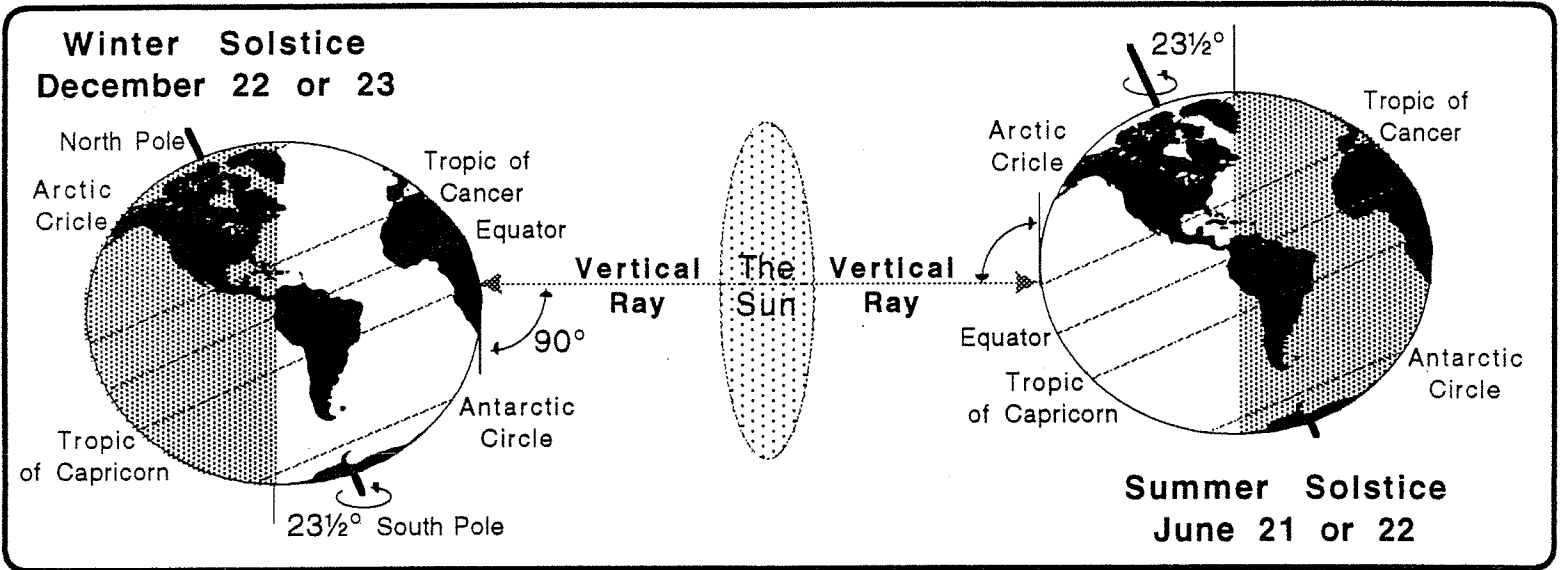


The vertical ray is the ray of sunlight from the zenith that strikes the Earth at an angle of 90°. The sun is always directly overhead at some place on the Earth.



The diagrams above show the Earth at the summer and winter solstice positions. Use it to answer the questions below.

1. The vertical ray strikes the Earth at an angle of... \_\_\_\_\_
2. About June 21, the vertical ray strikes the... \_\_\_\_\_
3. The vertical ray hits the Tropic of Capricorn in... \_\_\_\_\_
4. On June 21, the sun is visible at midnight north of the... \_\_\_\_\_
5. The vertical ray strikes the the Tropic of Cancer on the... \_\_\_\_\_
6. The South Pole is in total darkness all day on... \_\_\_\_\_

This diagram shows the position of the vertical ray on the equinoxes, in March and September.

7. Equinox means \_\_\_\_\_
8. What is the latitude of the Tropic of Cancer? \_\_\_\_\_  
 ...the North Pole? \_\_\_\_\_ ...the Arctic Circle? \_\_\_\_\_
9. How could you determine the exact position of the Tropic of Cancer without using a measuring instrument or a map?  
 \_\_\_\_\_  
 \_\_\_\_\_

