

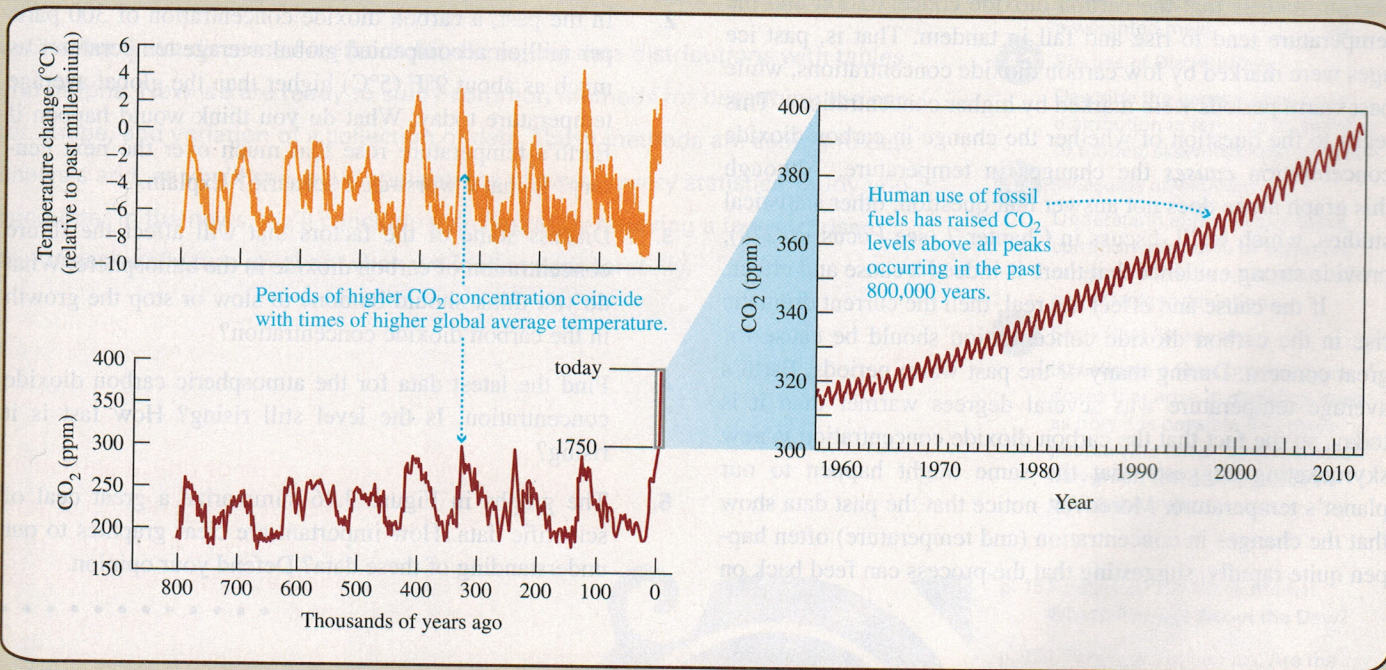


## Are We Changing Earth's Atmosphere?

Sometimes a well-drawn figure can teach important lessons even before you understand everything about it. Figure 3.46 is a case in point.

As the label shows, the graph shows how the concentration of carbon dioxide in Earth's atmosphere varies with time. The units used for the concentration are *parts per million*, which means the number of carbon dioxide molecules among each one million molecules of air. For example, a concentration of 300 parts per million means that there are 300 molecules of carbon dioxide among each one million molecules of air, which is equivalent to a concentration of 3 in 10,000 or 0.03%.

Notice that the main graph shows how the carbon dioxide concentration has varied over the past 800,000 years. Scientists obtain these data by measuring the concentration of carbon dioxide trapped in bubbles in ancient ice, which they collect by drilling ice cores out of the ice sheets in Greenland



**Figure 3.46** (Left) The atmospheric concentration of carbon dioxide and global average temperature reconstructed from ice core data for the past 800,000 years. *Source:* European Project for Ice Coring in Antarctica. (Right) The concentration has been directly measured in the atmosphere since the late 1950s. Note: The wiggles in the right graph represent seasonal fluctuations; the line running through the wiggles represents the general trend. *Source:* National Oceanic and Atmospheric Administration.