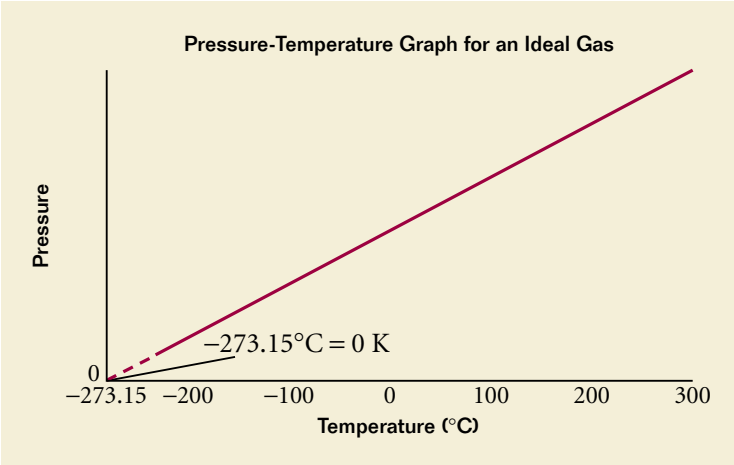

Figure 4
This graph suggests that if the gas's temperature could be lowered to −273.15°C, or 0 K, the gas's pressure would be zero.

suggested in the graph of pressure versus temperature for an ideal gas at constant volume, shown in **Figure 4.** As the gas's temperature decreases, so does its pressure. The graph suggests that if the temperature could be lowered to −273.15°C, the pressure of the sample would be zero. This temperature is designated in the Kelvin scale as 0.00 K, where K is the symbol for the temperature unit called the *kelvin.* Temperatures in this scale are indicated by the symbol *T.*

A temperature difference of one degree is the same on the Celsius and Kelvin scales. The two scales differ only in the choice of zero point. Thus, the ice point (0.00°C) equals 273.15 K, and the steam point (100.00°C) equals 373.15 K (see **Table 2**). The Celsius temperature can therefore be converted to the Kelvin temperature by adding 273.15.

CELSIUS-KELVIN TEMPERATURE CONVERSION

$$T = T_C + 273.15$$

Kelvin temperature = Celsius temperature + 273.15

Kelvin temperatures for various physical processes can range from around 1 000 000 000 K (10^9 K), which is the temperature of the interiors of the most massive stars, to less than 1 K, which is slightly cooler than the boiling point of liquid helium. The temperature 0 K is often referred to as *absolute zero.* Absolute zero has never been reached, although laboratory experiments have reached temperatures of just a half-billionth of a degree above absolute zero.

Table 2 Temperature Scales and Their Uses

Scale	Ice point	Steam point	Applications
Fahrenheit	32°F	212°F	meteorology, medicine, and non-scientific uses (U.S.)
Celsius	0°C	100°C	meteorology, medicine, and non-scientific uses (outside U.S.); other sciences (international)
Kelvin (absolute)	273.15 K	373.15 K	physical chemistry, gas laws, astrophysics, thermodynamics, low-temperature physics