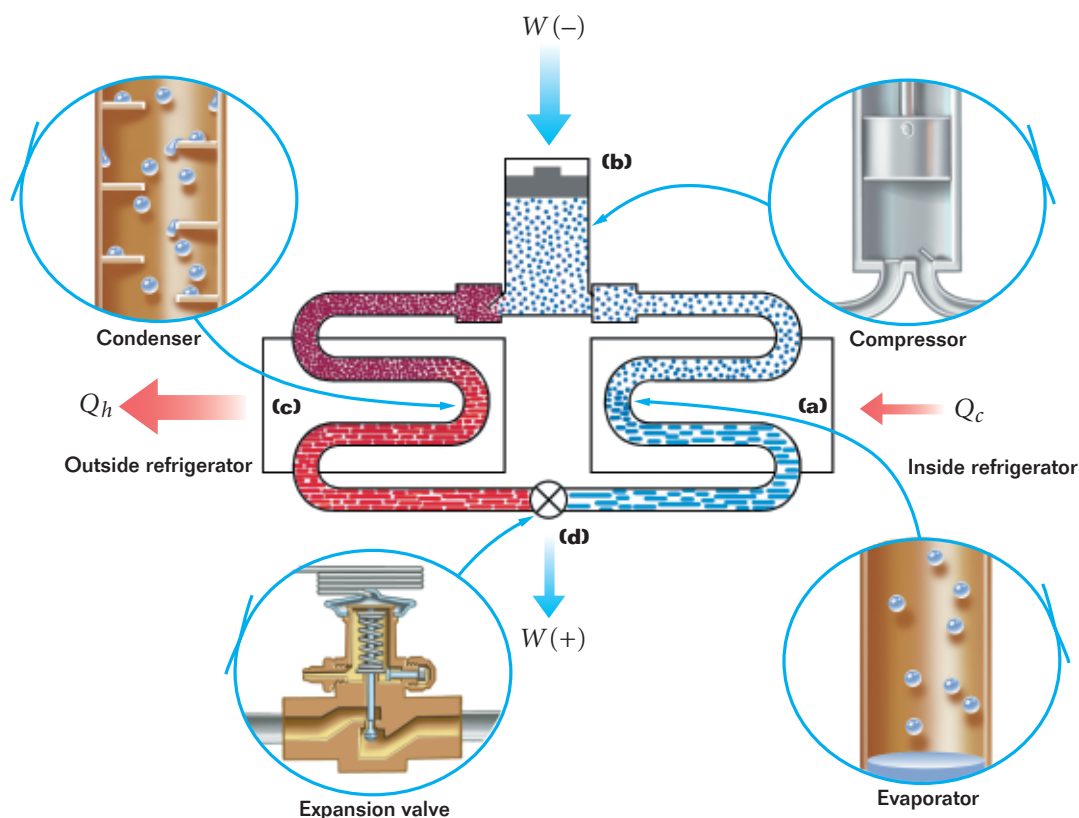
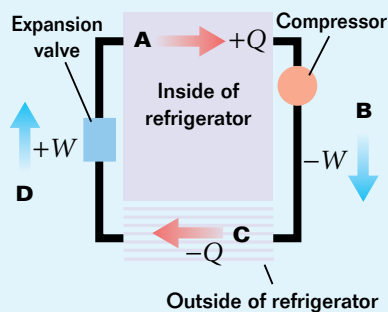


In doing so, the gas expands and cools.

The refrigerant now has the same internal energy and phase as it did at the start of the process. If the temperature of the refrigerant is still lower than the temperature of the air inside the refrigerator, the cycle will repeat. Because the final internal energy is equal to the initial internal energy, this process is cyclic. The first law of thermodynamics can be used to describe the signs of each thermodynamic quantity in the four steps listed, as shown in the table.

### Thermodynamics of a Refrigerant

Step	$Q$	$W$	$\Delta U$
A	+	0	+
B	0	-	+
C	-	0	-
D	0	+	-



In each of the four steps of a refrigeration cycle, energy is transferred to or from the refrigerant either by heat or by work.