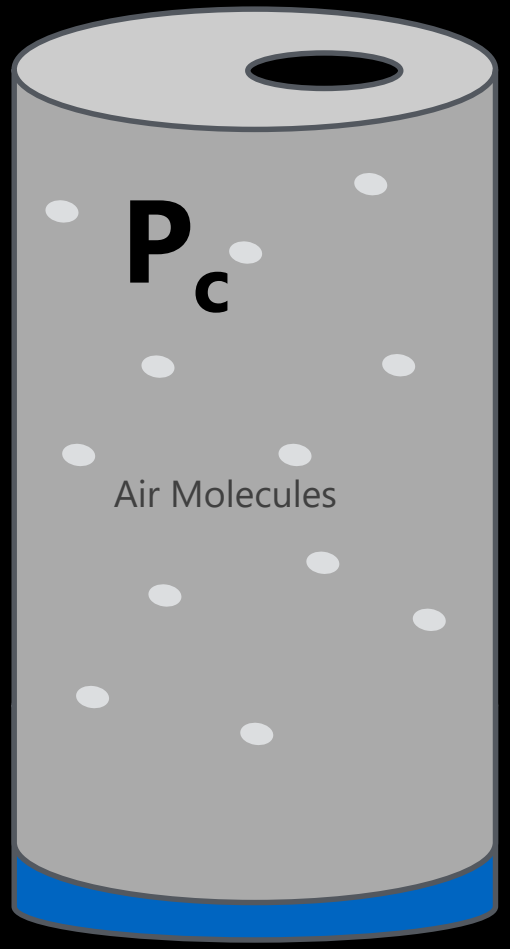
The Power of Pressure

P_a

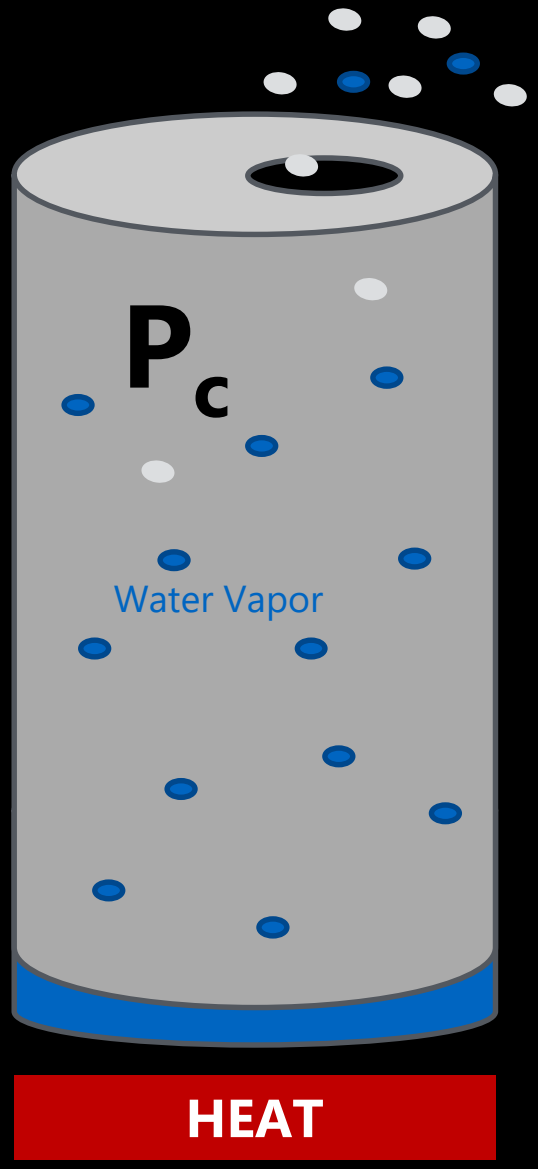


$$P_a = P_c$$

Atmospheric pressure

Pressure in can

The Power of Pressure



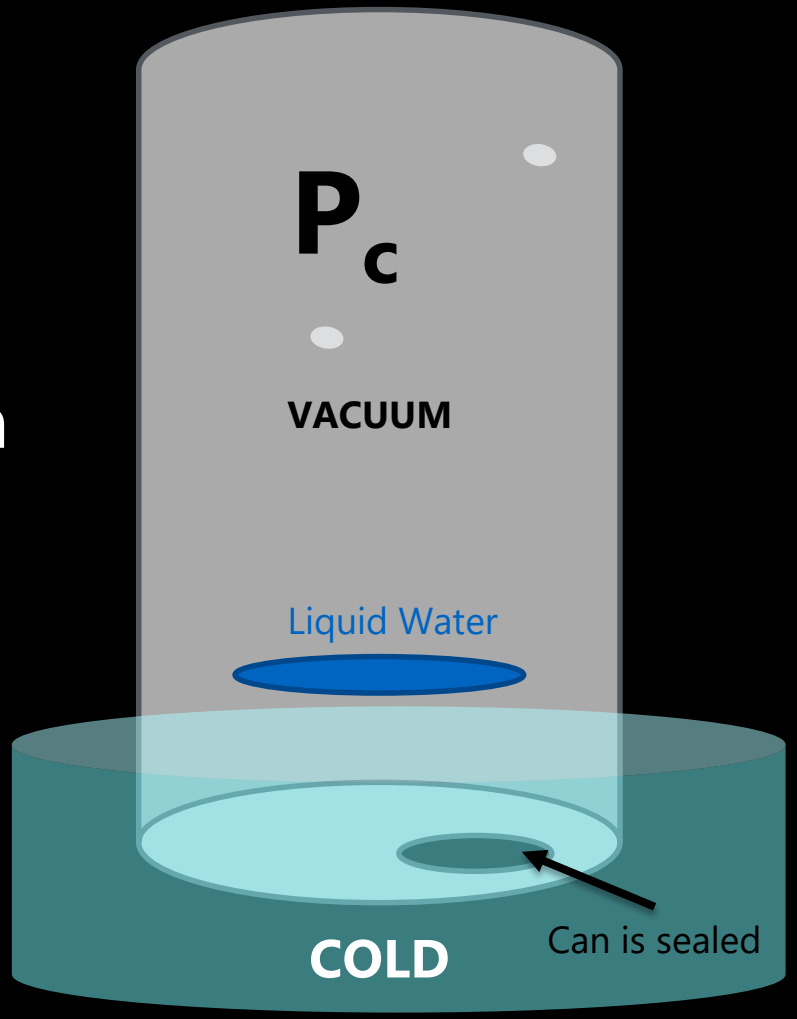
P_a

$$P_a = P_c$$

Atmospheric pressure

Pressure in can

The Power of Pressure

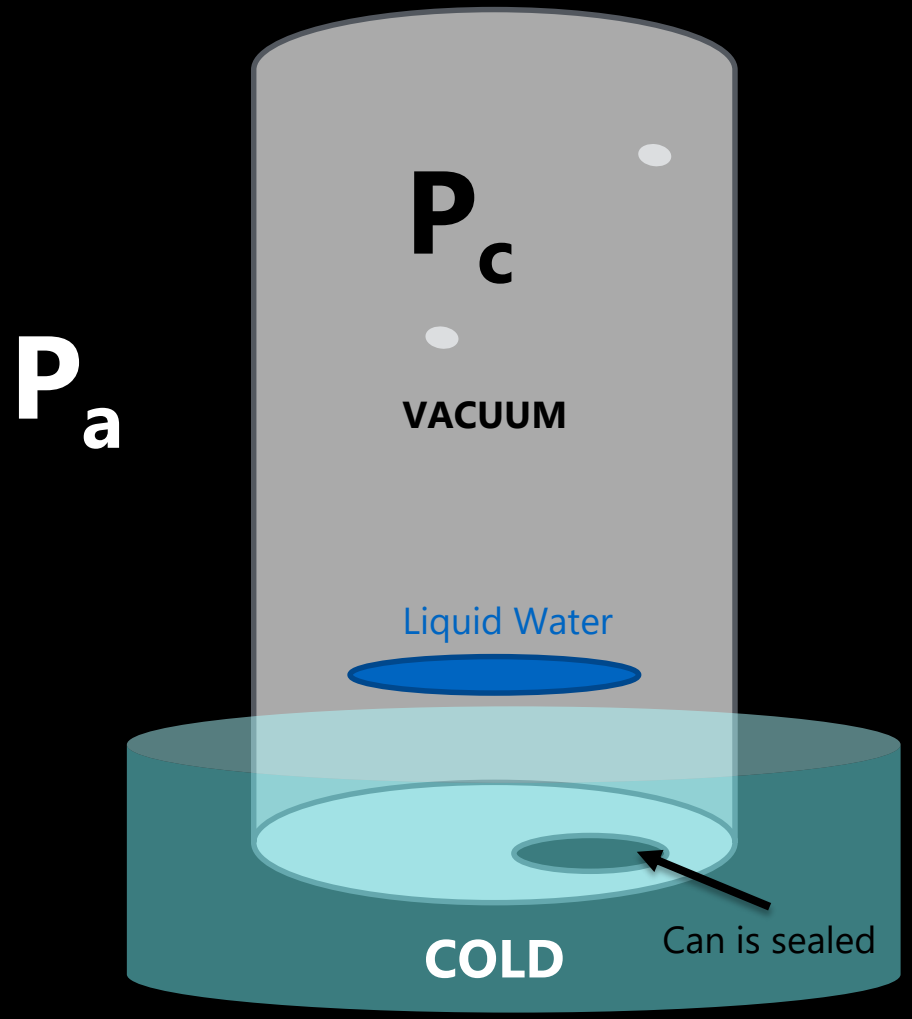


$$P_a \neq P_c$$

Atmospheric pressure

Pressure in can

The Power of Pressure



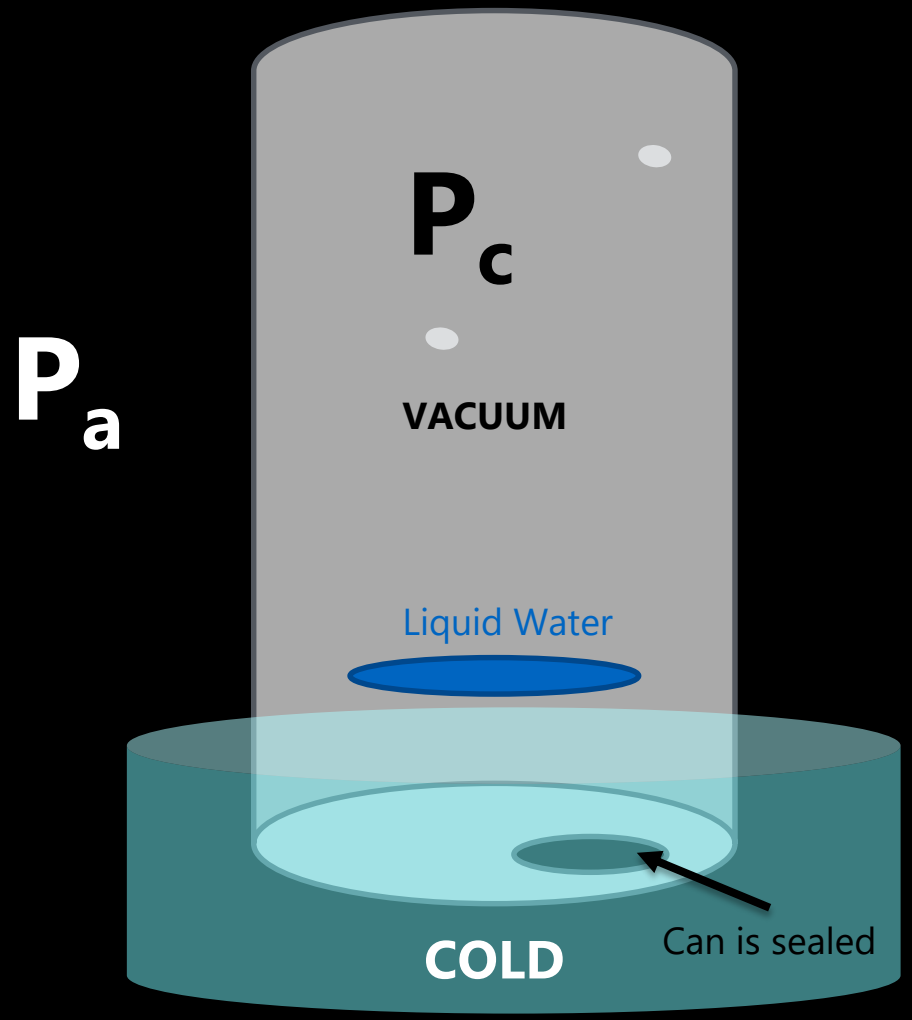
$$P_a > P_c$$

Atmospheric pressure

Pressure in can

Fewer molecules exerting pressure inside the can
(because of condensation)

The Power of Pressure



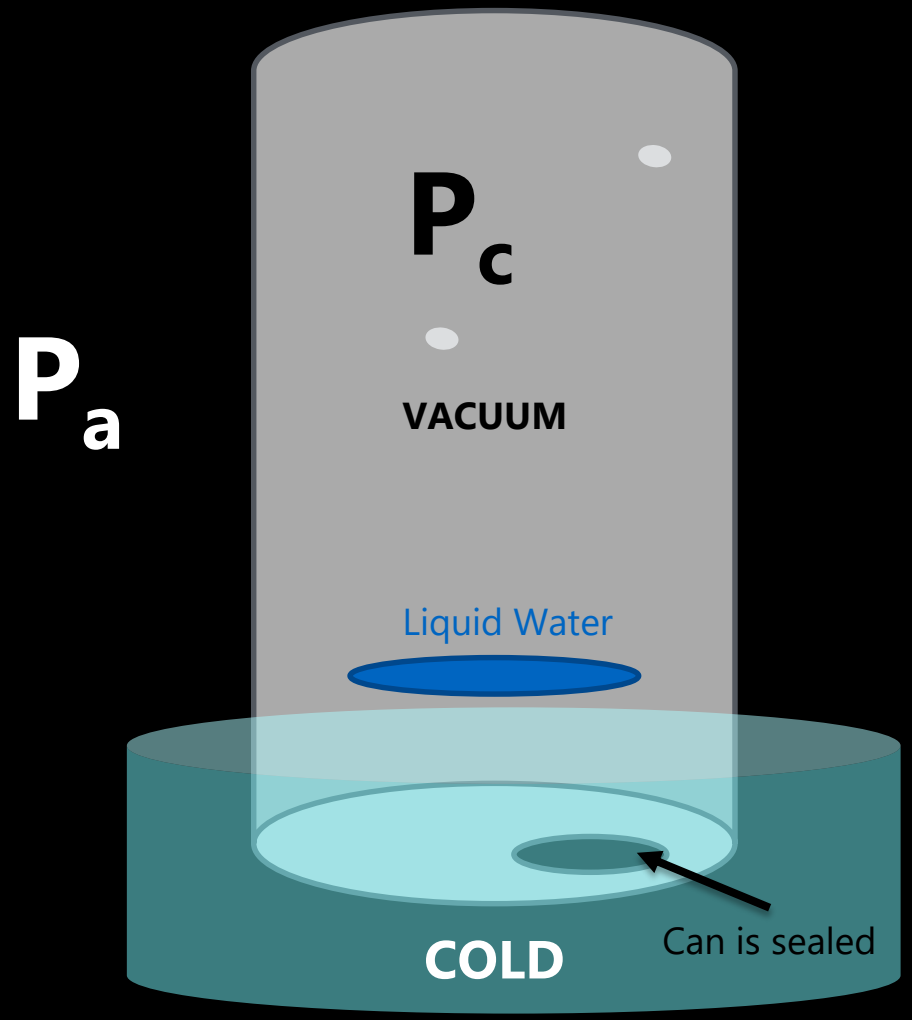
$$P_a > P_c$$

Atmospheric pressure

Pressure in can

How does the atmosphere equalize these two pressures?

The Power of Pressure

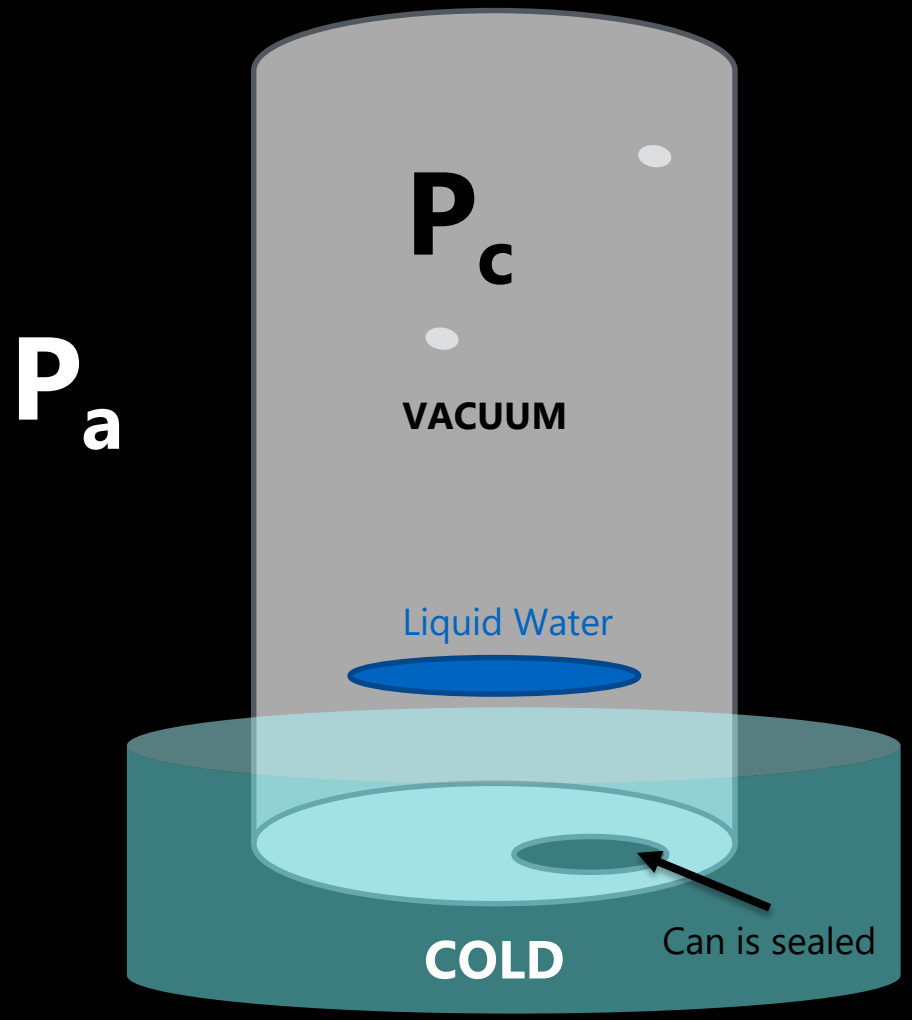


$$PV = nRT$$

pressure
volume
# of molecules
constant
temperature

Pressure in the can (P_c) must increase to match atmospheric pressure.

The Power of Pressure



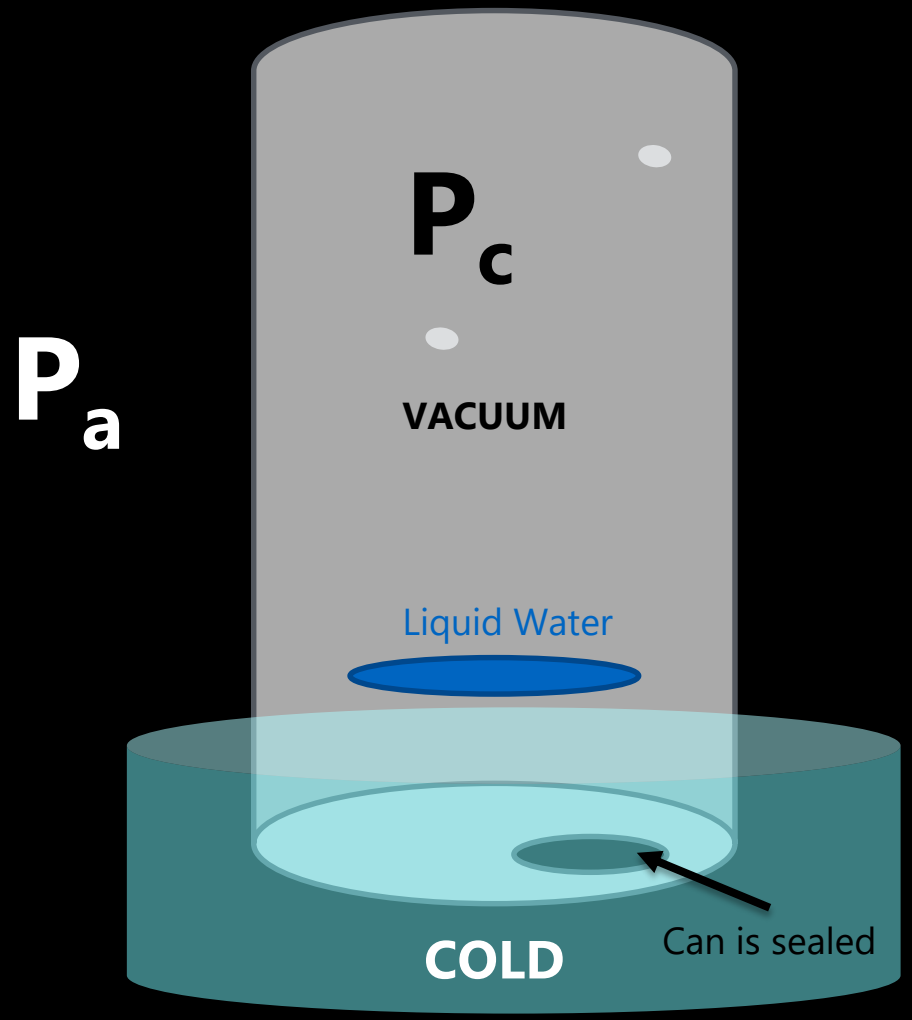
$$PV = nRT$$

P: pressure
V: volume
n: # of molecules
R: constant
T: temperature

To increase P, another variable must change

↓V ↑n ↑T

The Power of Pressure



$$PV = nRT$$

P: pressure
V: volume
n: # of molecules
R: constant
T: temperature

To increase pressure in the can **the volume of the can must decrease.**

The Power of Pressure