Sensible & Latent Heat Process
Sensible Heat

Adding HEAT to ice at 0°F causes the ice to warm up **WITHOUT** changing state (melting). This is **SENSIBLE HEAT**.
Latent Heat

Adding HEAT to ice at 32°F causes the ice to change state (melt) WITHOUT changing temperature. This is LATENT HEAT.
Sensible Heat
(Once Again)

1lb - H₂O - 32°F
160 BTUs

Add 180 BTUs of Sensible Heat

Adding HEAT to WATER at 32°F causes the Water to warm up (increase temperature). Once again, we are adding Sensible Heat.

1lb - H₂O - 212°F
340 BTUs
Add 970 BTUs of Latent Heat

Adding HEAT to WATER at 212°F causes the Water to change state (turn to steam) without changing temperature. Once again, we are adding LATENT HEAT.
Superheat

Adding HEAT to Steam at 212°F causes the steam to increase in temperature (sensible heat). Heat added to a vapor above the vaporization temperature for that pressure is called Superheat.

\[
\begin{align*}
212°F \text{ Steam} & \quad \rightarrow \quad 20 \text{ BTUs Added} \\
252°F \text{ Steam} & \quad \rightarrow \quad 252°F \text{ Steam} - 212°F \text{ Steam} = 40°F \text{ Superheat}
\end{align*}
\]
Regardless of what the heat source is;

Sensible & Latent
Refer to the process
Or
How the heat is being utilized

REMEMBER:

**Sensible Heat** = change in temperature
(no change in state)

**Latent Heat** = change of state
(no change in temperature)
Remember:

• A vapor is said to be “superheated” when its temperature is **higher** than its saturation temperature at the same pressure.

• “Sub-cooling” occurs to a liquid when its temperature is **below** saturation for the same pressure.