

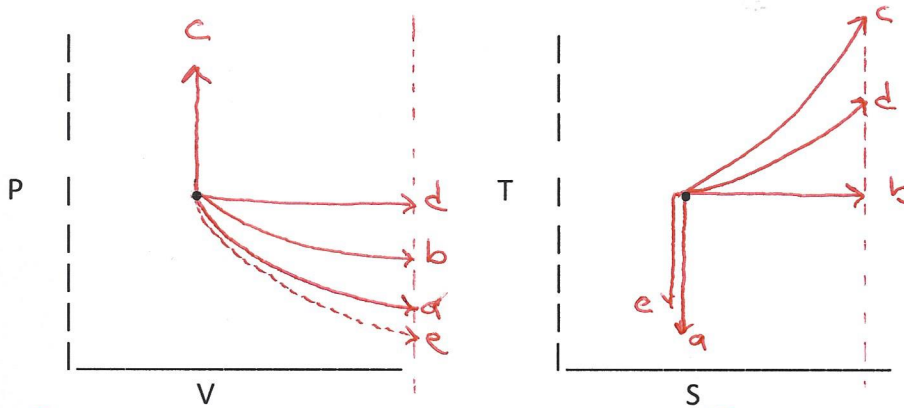
PROCESS DIAGRAM ACTIVITY

Names key

1) Form in to groups of 3-4 and complete the questions (i) and (ii)

(i) Sketch the following processes on pressure-volume (P-V) and temperature-entropy (T-S) diagrams. Use the given starting point for all processes. Label the endpoint of each process with the appropriate letter. Assume ideal gas behavior.

- (a) isentropic expansion
- (b) isothermal expansion
- (c) isochoric heat addition
- (d) isobaric heat addition
- (e) irreversible, adiabatic expansion



$W = \int P dV$

$Q = \int T dS$

$\Delta U = Q - W = \int m c_v dT$

(ii) Give the sign of the work, heat, and change in internal energy for each process. Assume ideal gas behavior.

| | W | Q | ΔU |
|---|---|---|------------|
| (a) isentropic expansion | + | 0 | - |
| (b) isothermal expansion | + | + | 0 |
| (c) isochoric heat addition | 0 | + | + |
| (d) isobaric heat addition | + | + | + |
| (e) <u>irreversible</u> , adiabatic expansion | + | 0 | - |