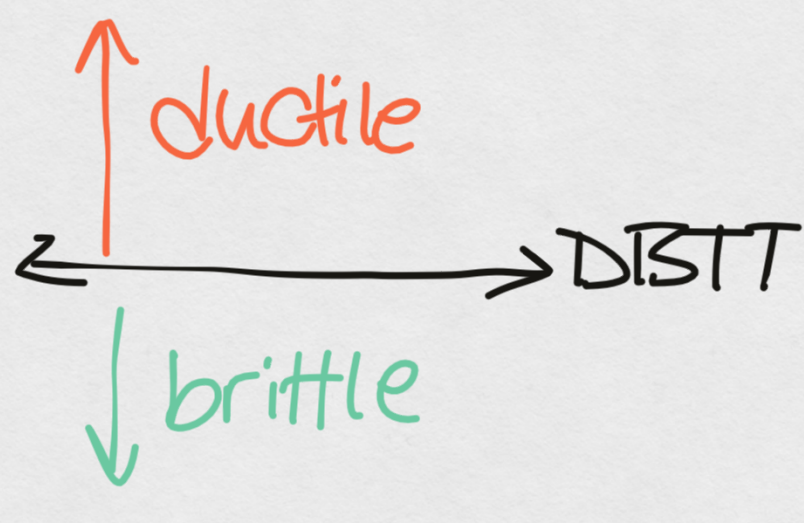
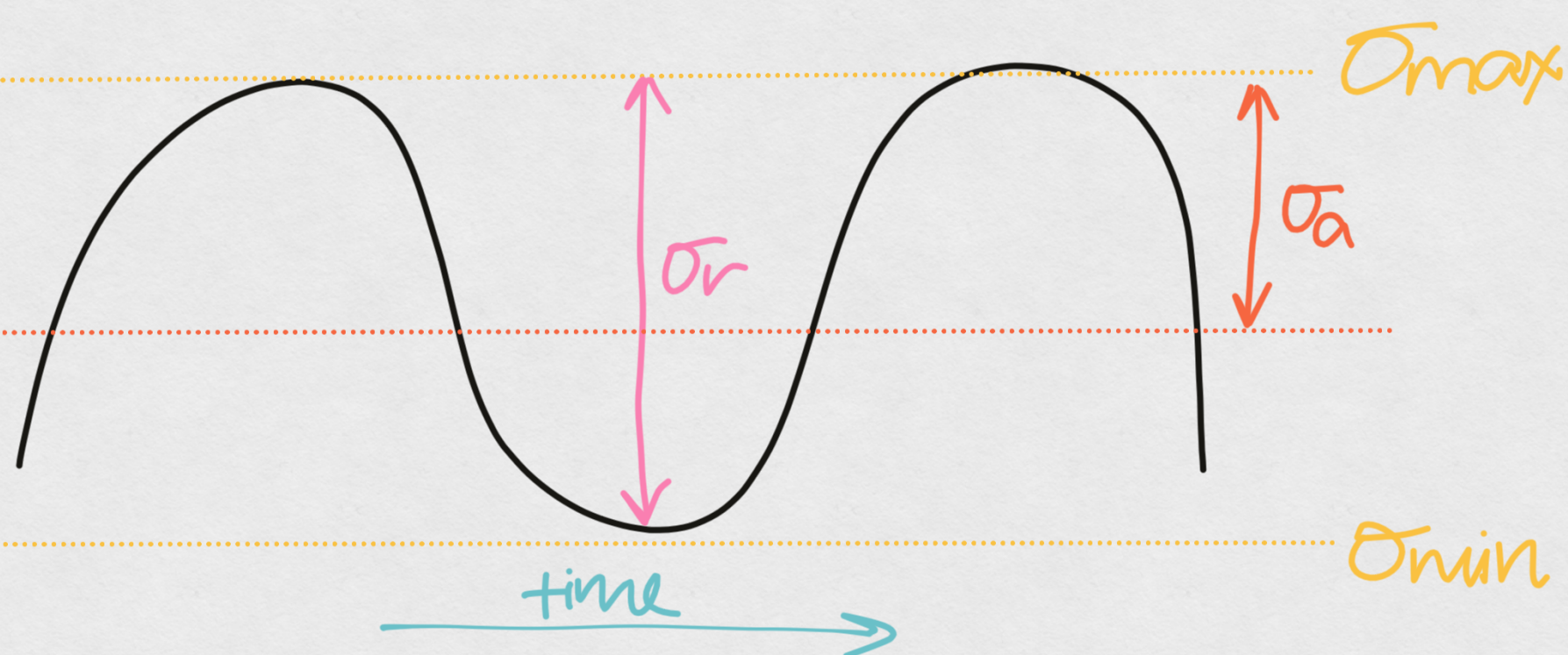




Charpy measures the energy absorbed by material at frac.

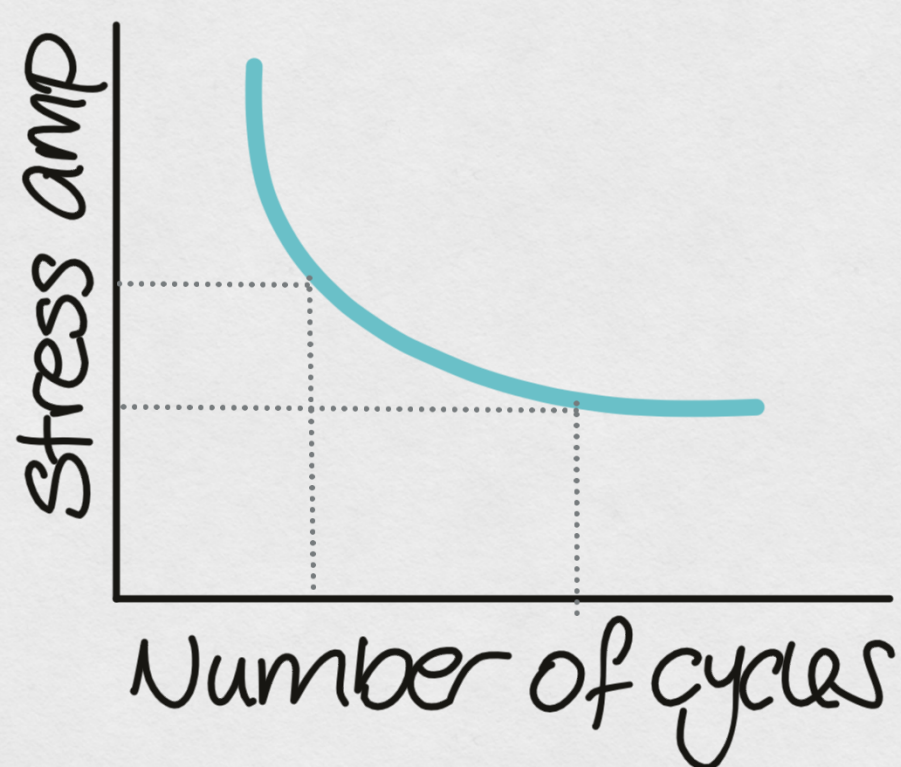
Fatigue: under repetitive loads (below ultimate strength) cracks formate, fatigue failure happens below ult. stres, behaves brittle-like, is sudden.



σ_r = stress range

σ_a = amplitude

S-N Curve:



high stress $\rightarrow$ low cycle $\rightarrow$ plastic
low stress $\rightarrow$ high cycle $\rightarrow$ elastic

fatigue life; number of cycles that cause failure.

increasing the mean stress, decreases fatigue life.

ductile: has higher fatigue life.

fatigue limit: max stress the material can withstand indefinitely without failing due to fatigue.

Steps of Fatigue Failure:

- 1-crack initiation: cracks form
- 2- " propagation: cracks advance with each cycle.
- 3-final failure: failure occurs rapidly after the crack is at a critical size.