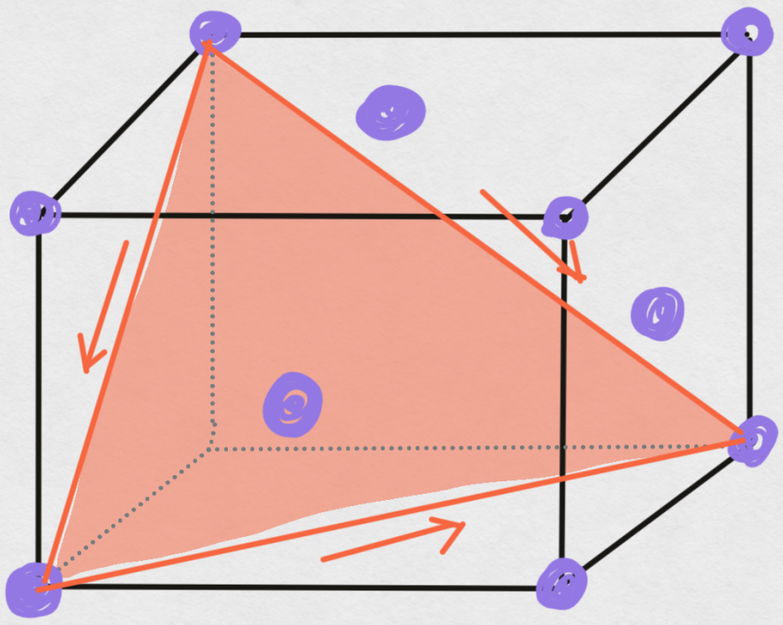
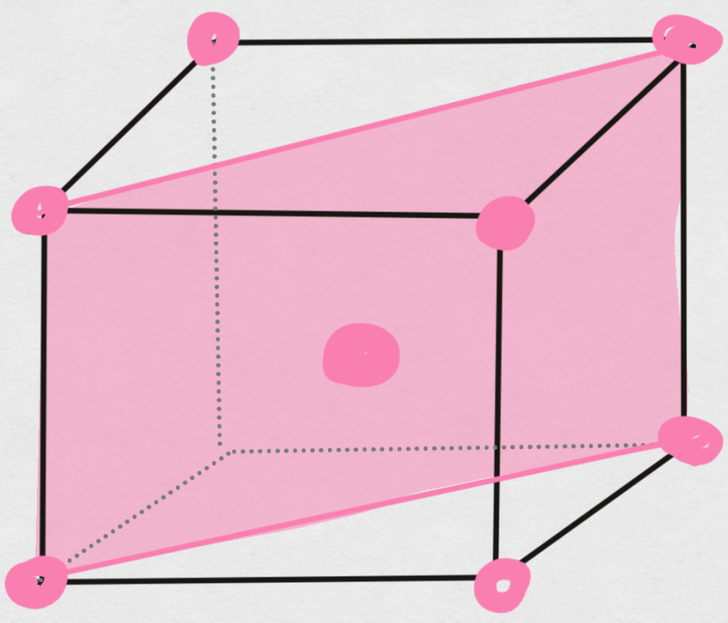




for FCC, {111} planes
<110> directions
close packed planes
close packed directions

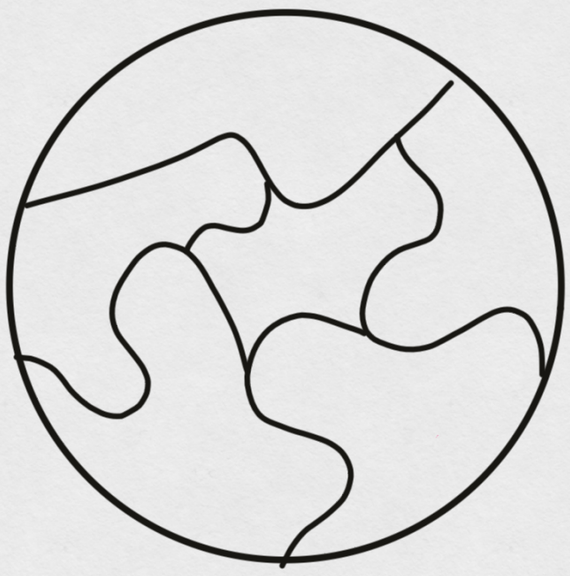
for BCC, {110}, {112}, {123}
⟨111⟩
—
close packed direction

FCC and BCC → ductile, have large number of slip systems.

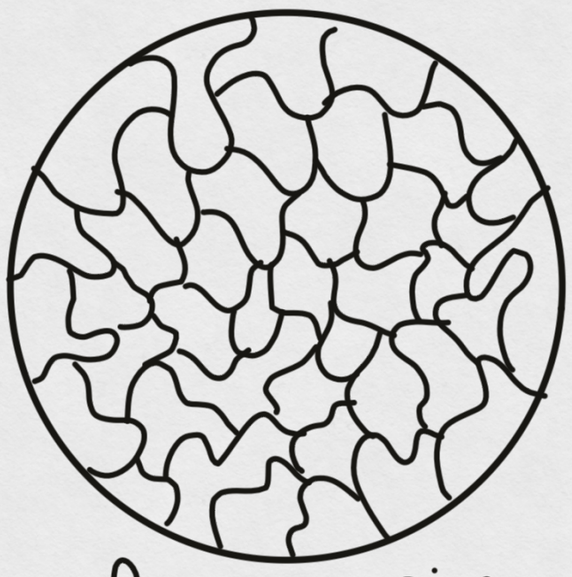
Strengthening mechanisms:

ability to plastically deform = ability of dislocations to move.

reducing the mobility of dislocations, increases strength.



coarse grain



fine grain

fine grain is tougher.

reducing the grain size = increasing the boundary.

grain boundaries are barriers to slip.

Grain Size Reduction:

high angle grain boundary
→ more misorientations.
p. deformation happens first at high angle gr. boun.
their energies are higher,
they want to create new bonds.

Solid Solution

alloying with impurity atoms.
increasing the impurity concentration ↑ tensile and yield strengt
how? solute atoms create lattice distortion, causing dislocatio