13 - Faults and Folds

Crust

- The crust varies in thickness, as we learn with plate tectonics
- Lower crust under a lot of pressure
    - Not hot enough to melt, the heat and pressure make the rocks soft and bendy
        - This is called plastic, or ductile behavior
- Rocks in the lower crust will become strained, and the strain is permanent (non-recoverable strain)
- Folded rocks will stay folder

Stress

- A force that acts on rocks
- Tension (stretching)
- Compression (squishing)
- Shear (twisting)

Strain

- Any change in shape that results from stress
- Stress causes strain

Elastic

- Strain goes away when stress goes away (recoverable strain)

Plastic

- Strain is permanent, even after stress goes away (non-recoverable strain)

Brittle

- Rocks break into pieces when stress is applied (upper crust)

Ductile

- Rocks squish and behave plastically instead of cracking and breaking lower crust

The Brittle-Ductile Transition

- A depth in the crust that separates rocks that break from rocks that squish

- Rocks in the lower crust will become strained, and the strain is permanent (non-recoverable strain)

Folds

- During compression, folding allows the crust to *shorten* (become strained)
- Anticlines (upward folds)
- Synclines (downward folds)

Block Diagrams

- Foot Wall is below the fault
- Hanging wall is above the fault

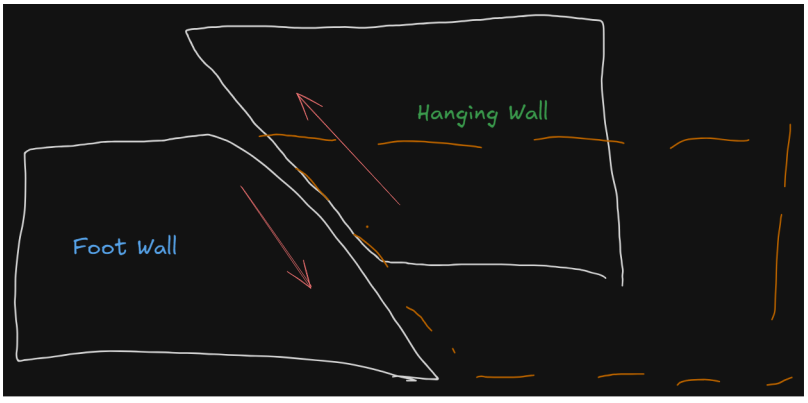
Quantifying Planar Features in a 3D Space

- Dip is the compass direction that a lane tilts towards.
- Strike is the compass direction of a line that forms from the intersection of a tilting plane with a second, horizontal plane

Faults

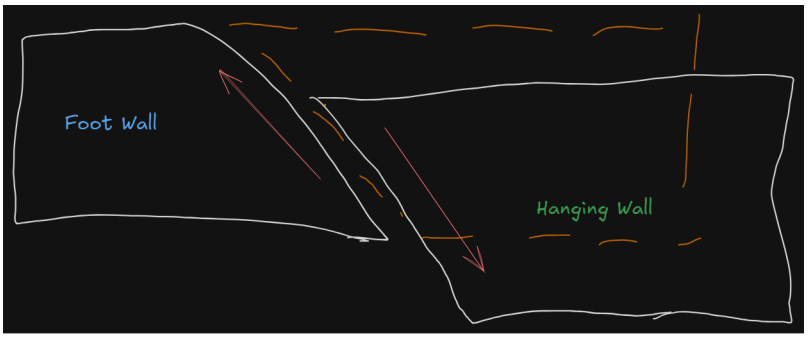
Reverse Fault

- Compression
- Hanging wall moves up and in relative to foot wall



Normal Fault

- Tension
- Hanging wall move down and out relative to foot wall



Transform Fault (Strike-Slip Fault)

- Tension