6 - Dating

Absolute Dating

- All you need is a tiny sample of material (mineral, bone) no larger than a grain of rice
- Gives us the true "age" of a fossil or rock
- Mainly organic tissue or igneous crystals
- Measure the amount of unstable isotopes that have "decayed" to figure our age

Isotopes

Definition

Atoms with a different number of neutrons than protons

- The number of protons (the atomic number) is fixed for any element
- The number of neutrons can vary

Parent isotope ⇒ daughter isotope

Example

Uranium ⇒ lead
The reaction spits out two neutrons
In a nuclear bomb, these uranium atoms are close together, the emitted neutrons cause other Uranium atoms to decay

Half Life

Example

Time in Microwave	Unpopped	Popped
0	100%	0%
3	50%	50%
6	25%	75%
9	12.5%	87.5%

The half life is 3 minutes

Number of half lives	Parent	Daughter
0	100%	0%
1	50%	50%
2	25%	75%
3	12.5%	87.5%
…	…	…

Relative Dating

> **Definition**
>
> Places events in geologic history in the proper order

- Mainly sedimentary rocks and lava flow

Superposition

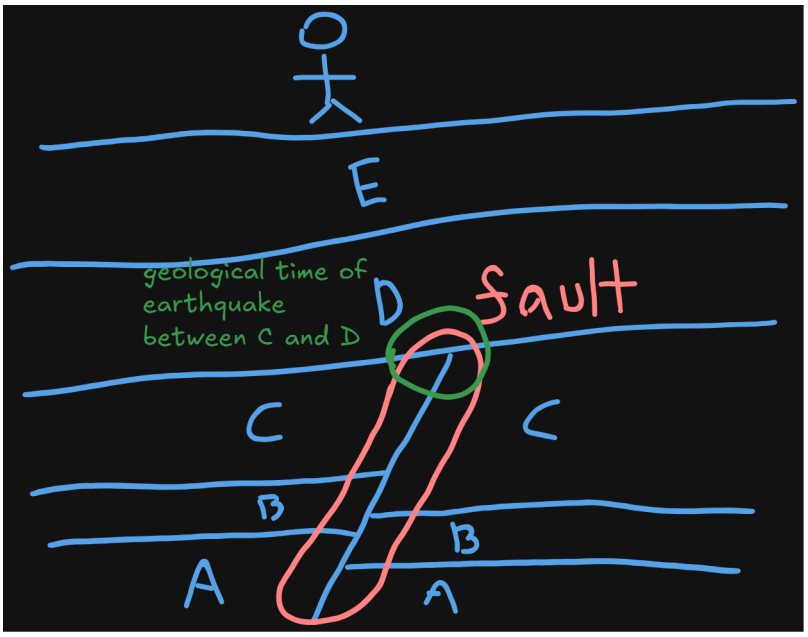
- See Layers

> **Definition**
> The youngest rocks are at the top, oldest at the bottom

Cross Cutting Relationships

> **Definition**
>
> Geologic features that cut through and across rocks are younger than those rocks

- Mostly faults and igneous intrusions



C flat due to erosion after earthquake

Law of Inclusions

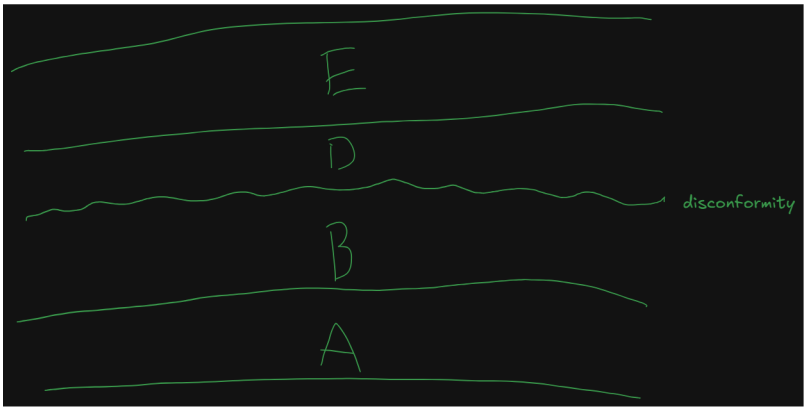
> **Definition**
>
> Rocks embedded in other rocks are **older** than those rocks they are embedded in

- In other words, the ingredients of something are older than the thing itself

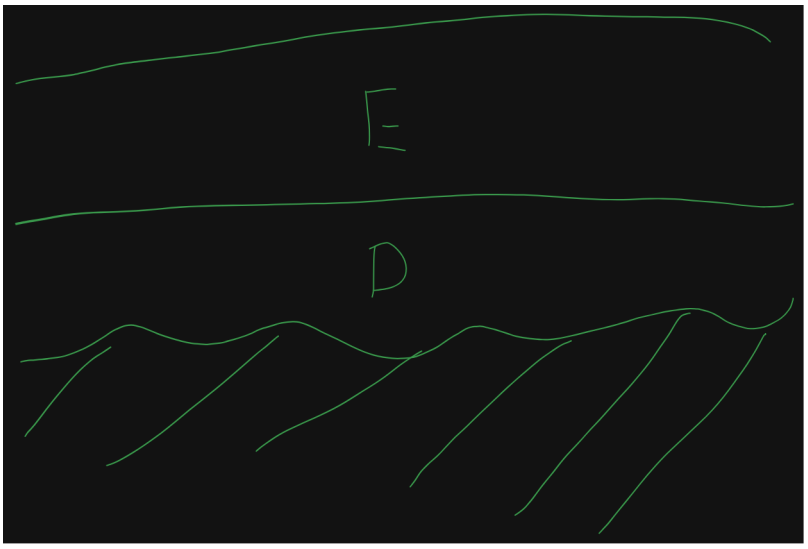
Law of Original Horizontality

Law of Unconformities

Disconformity



Angular Unconformity



Non-Conformity