Physical Geology

A mineral is a naturally occurring combination of specific elements that are arranged in a particular repeating three-dimensional structure or lattice

Rocks can form in a variety of ways. Igneous rocks form from magma (molten rock) that has either cooled slowly underground (e.g., to produce granite) or cooled quickly at the surface after a volcanic eruption (e.g., basalt).

Relative ages of units may be established by applying fundamental and simple geologic principles:

I. Law of Initial Horizontality
II. Law of Superposition
III. Cross-cutting relationships
IV. Lateral Continuity
V. Faunal and floral succession
VI. Law of Inclusions
VII. Metamorphic relationships

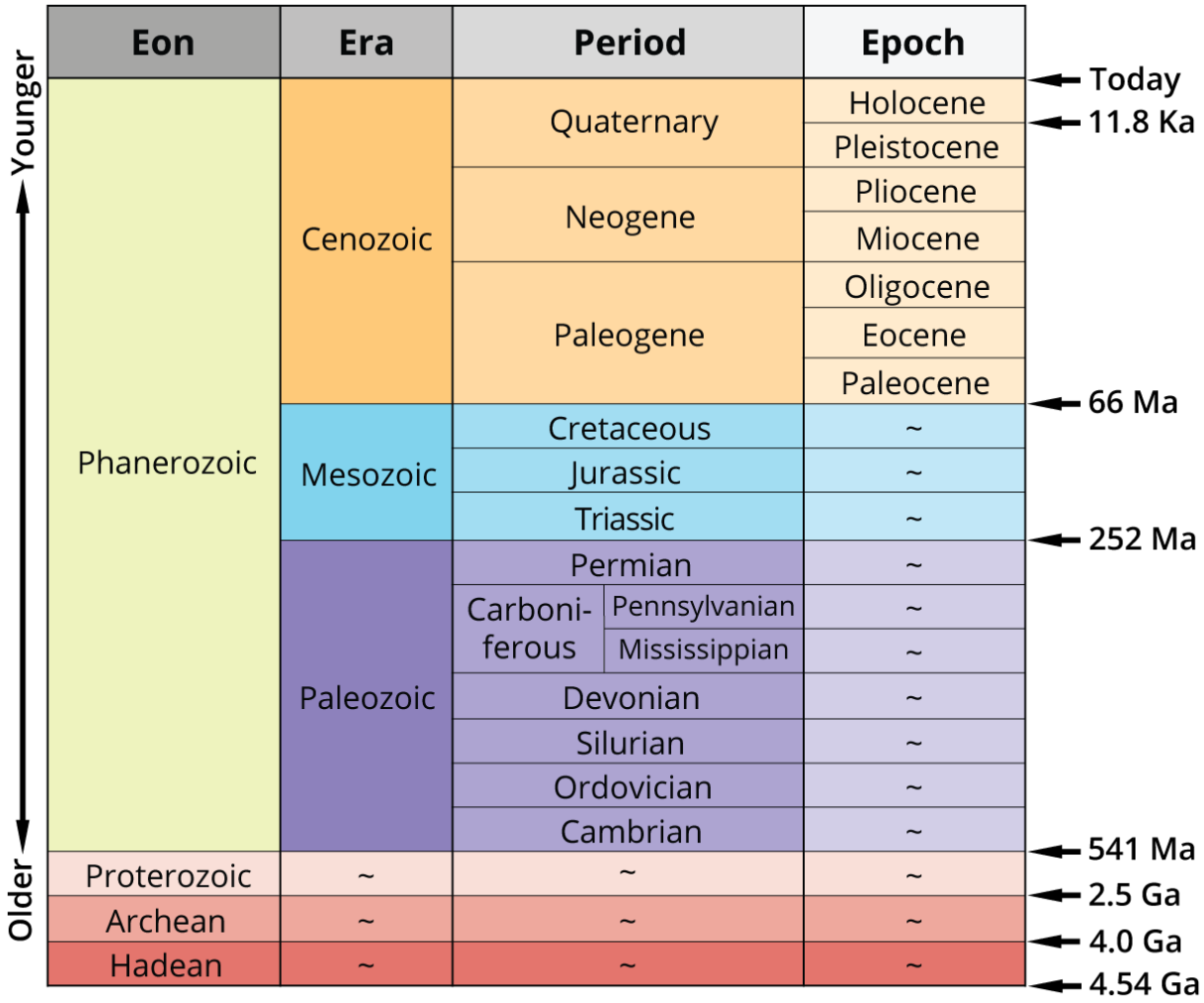
Top of Bed identification traits:

1. Graded beds -finer grained at the top
2. Truncated cross-bedding -slightly concave up
3. Ripple marks -concave up
4. Sole marks -concave up (flute casts form on the bottom of siltstone or sandstone bed)
5. Basal conglomerate -at base of formation
6. Rip-up clasts -shale clasts ripped up from deposits below and transported by currents
7. Scouring or channeling -concave up
8. Mud cracks -V points down
9. Solution surfaces -irregular surface at top of soluble rock
10. Pebble dents -matrix immediately below imbcddcd pebble is dented
11. Brachiopod shells -convex up, barnacles may form on top surface
12. Coral -narrow end down, branches upward
13. Pclecypod shells -disjointed shells arc generally convex upward
14. Worm trails -grooves on top of bed
15. Burrows -go down from the surface and open upward, may be filled in with a different material
16. Baked zone -under lava flow

17. Lava flows -vesicular portion of lava at top

18. Pillow lavas -convex up, bottoms of pillows have cusps pointing down

Geologic time scale



Camels **O**ften **Si**t **D**own **Car**efully; **Per**haps **T**heir **J**oints **Cre**ak?

Persistent **E**arly **O**iling **Mi**ght **P**revent **P**ermanent R**h**eumatism.

To memorize the Eras:

Ø Precambrian, Paleozoic, Mesozoic, Cenozoic:

* Please pay my children!

CENOZOIC ERAS

- **Holograms are very recent** (the Holocene is the most recent epoch)
- **Glaciers are plastic** or **My glaciers are made of plasticine** (the Pleistocene was the time of the "Great Ice Age")
- **The pliant Americas joined together** or **Pliable hominids arose** (Hominidae began in the Pliocene, and North and South America joined up)
- **Mild weather saw Africa collide with Asia** (the Miocene was warmer than the preceding epoch; during this time Africa finally connected to Eurasia)
- **Elephants become oligarchs!** (during the Oligocene mammals became the dominant vertebrates)
- **Continents obscenely separate** (Laurasia, the northern supercontinent, began to break up at the beginning of the Eocene; Gondwanaland, the southern supercontinent, continued its breakup)
- **Pale from the disaster, we pull ourselves together** (the Paleocene marks the beginning of a new era, after the K-T boundary event (thought by many to be an asteroid impact) in which the dinosaurs and so much other life died)