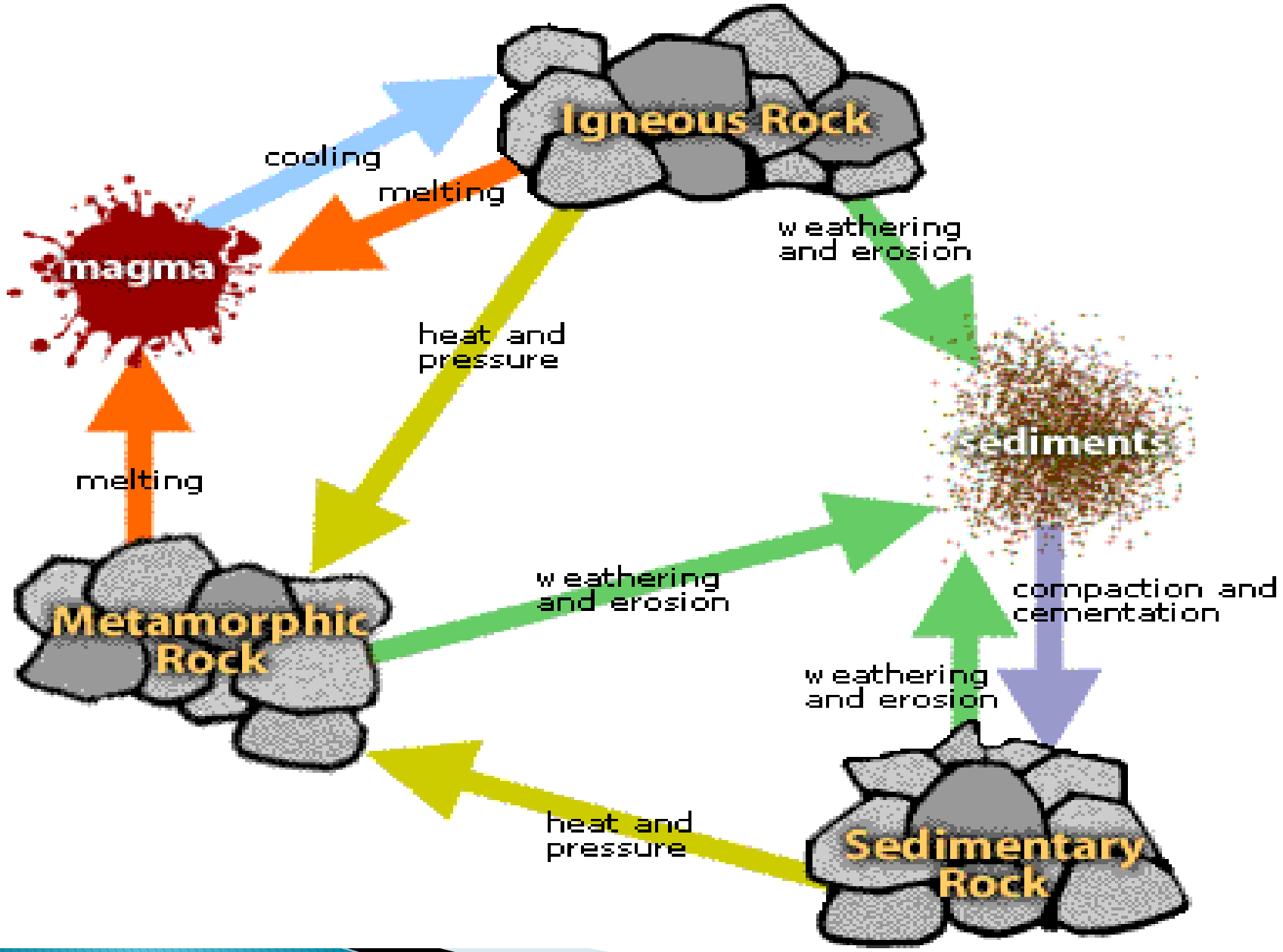
"Kindness is a mark of faith, and whoever is not kind has no faith."

Prophet Muhammad (PBUH) (Muslim)

ROCK CYCLE

Rock Cycle

- The process in which igneous ,metamorphic and sedimentary rocks get converted into each other.


Igneous Rock
cooling
melting
magma
weathering
and erosion
heat and
pressure
sediments
melting
Metamorphic
Rock
weathering
and erosion
compaction and
cementation
weathering
and erosion
heat and
pressure
Sedimentary
Rock

Igneous Rock

- Igneous rock is formed when magma cools and makes crystals.
- Magma is a hot liquid made of melted minerals. The minerals can form crystals when they cool.
- Igneous rock can form underground, where the magma cools slowly or igneous rock can form above ground, where the magma cools quickly.

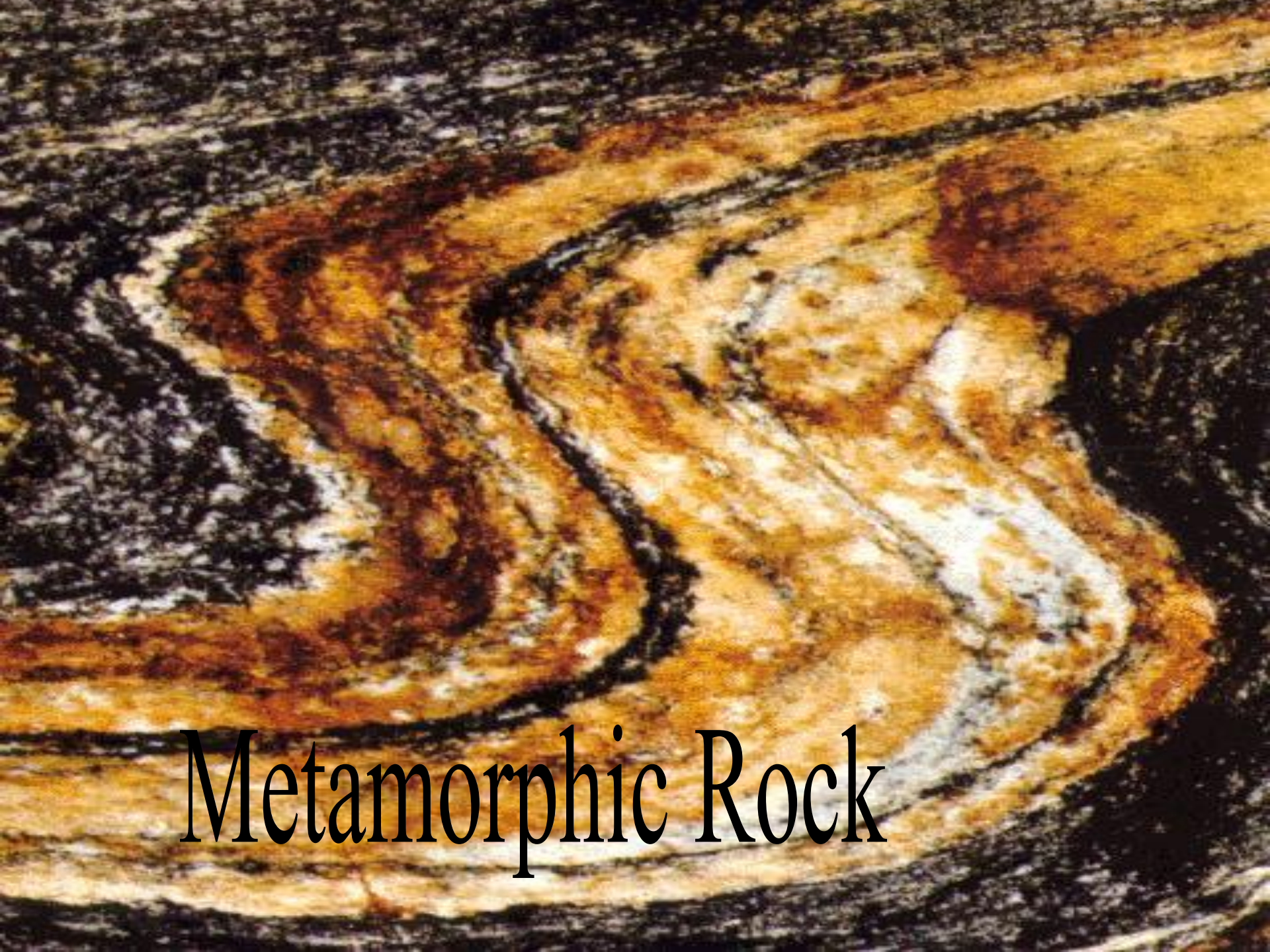
Sedimentary Rock

- Sedimentary rocks form at or near the earth's surface at relatively low temperatures and pressures primarily by:
- deposition by water, wind or ice
- precipitation from solution (may be biologically mediated)
- growth in position by organic processes (e.g., carbonate reefs)


Sedimentary Rock

Metamorphic Rock

- Metamorphic Rock is formed when rocky material experiences intense heat and pressure in the crust of the earth.
- Through the metamorphic process, both igneous rocks and sedimentary rocks can change into metamorphic rocks, and a metamorphic rock can change into another type of metamorphic rock.
- Heat and pressure do not change the chemical makeup of the parent rocks but they do change the mineral structure and physical properties of those rocks.


Metamorphic Rock

Sediment

- Sediment can either be:
- Material, originally suspended in a liquid, that settles at the bottom of the liquid when it is left standing for a long time
- Material eroded from preexisting rocks that is transported by water, wind, or ice and deposited elsewhere

Melting

- Melting is the result of continued heating
- Leads to production of magma and new igneous rocks which are formed when the the magma cools.
- This process depends on the size of the reservoir that it drains and the relative intensity or activity of plate tectonics.
-

Heat and Pressure

- Metamorphic rocks trapped underground are still subject to enormous heat from rising magma, or heated water, and pressure. Sometimes the heat can get so intense the rocks actually melt.
- Pressure comes from the incredible weight of material surrounding the rock on all sides.
- The pressure pushes new minerals into the rock and drives other minerals out; the result, of course, is that the rock is chemically changed.

Subduction

- A rock that gets caught up in the subduction zone may get dragged down with the oceanic plate.
- As the rock gets dragged down, they undergo metamorphism.
- Some parts of the rocks get taken all the way down to the mantle where they slowly mix with the rest of the mantle. – this is the only way that rocks formed on the continent get recycled with the mantle.

Uplifting

- Because certain rocks are created under the Earth's surface A process called uplifting occurs through orogeny and volcanic process, which then bring rocks to the surface. The rock is eventually becomes recycled again.

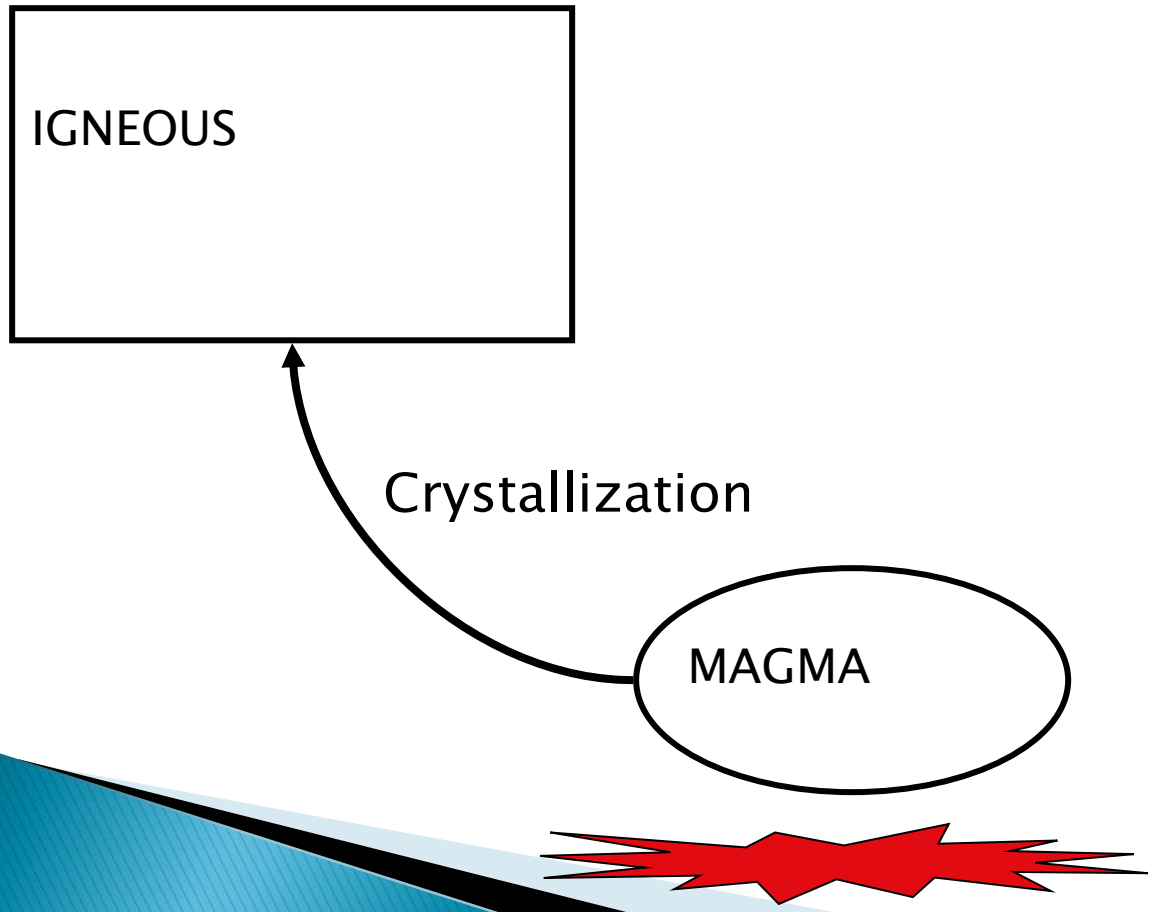
Transportation

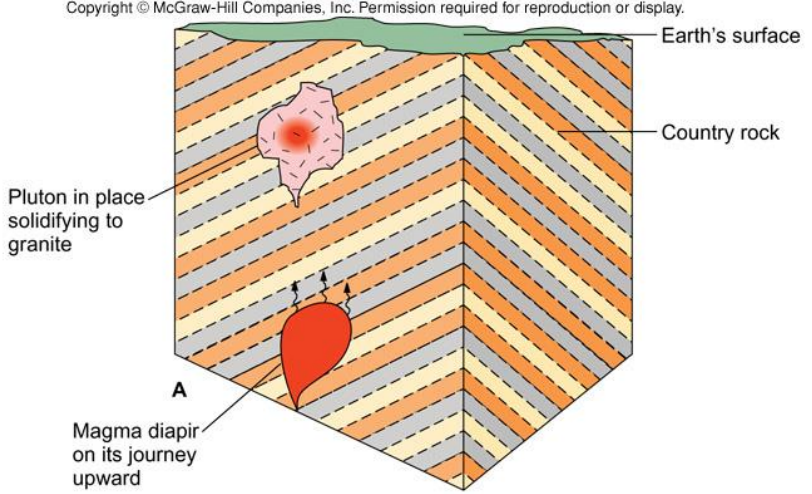
- This process occurs when the particles created by weathering are carried by ice, air, or water to a region of lower energy known as a sedimentary basin.

Decomposition

- Decomposition takes place when a lowering of hydraulic energy, organic biochemical activity, or chemical changes occur.

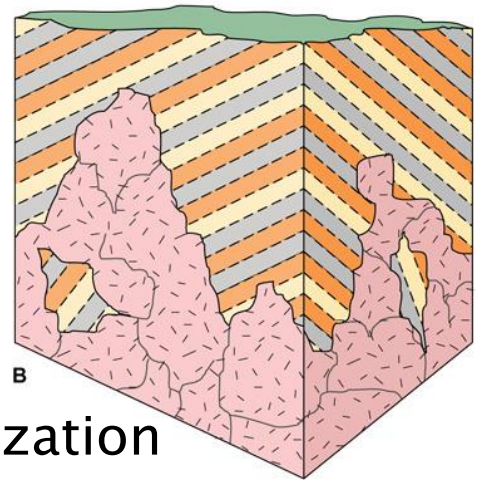
MAGMA

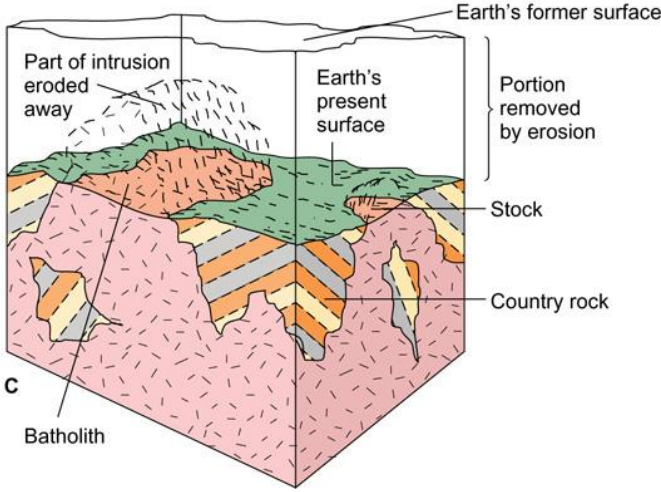

IGNEOUS
Crystallization
MAGMA



IGNEOUS

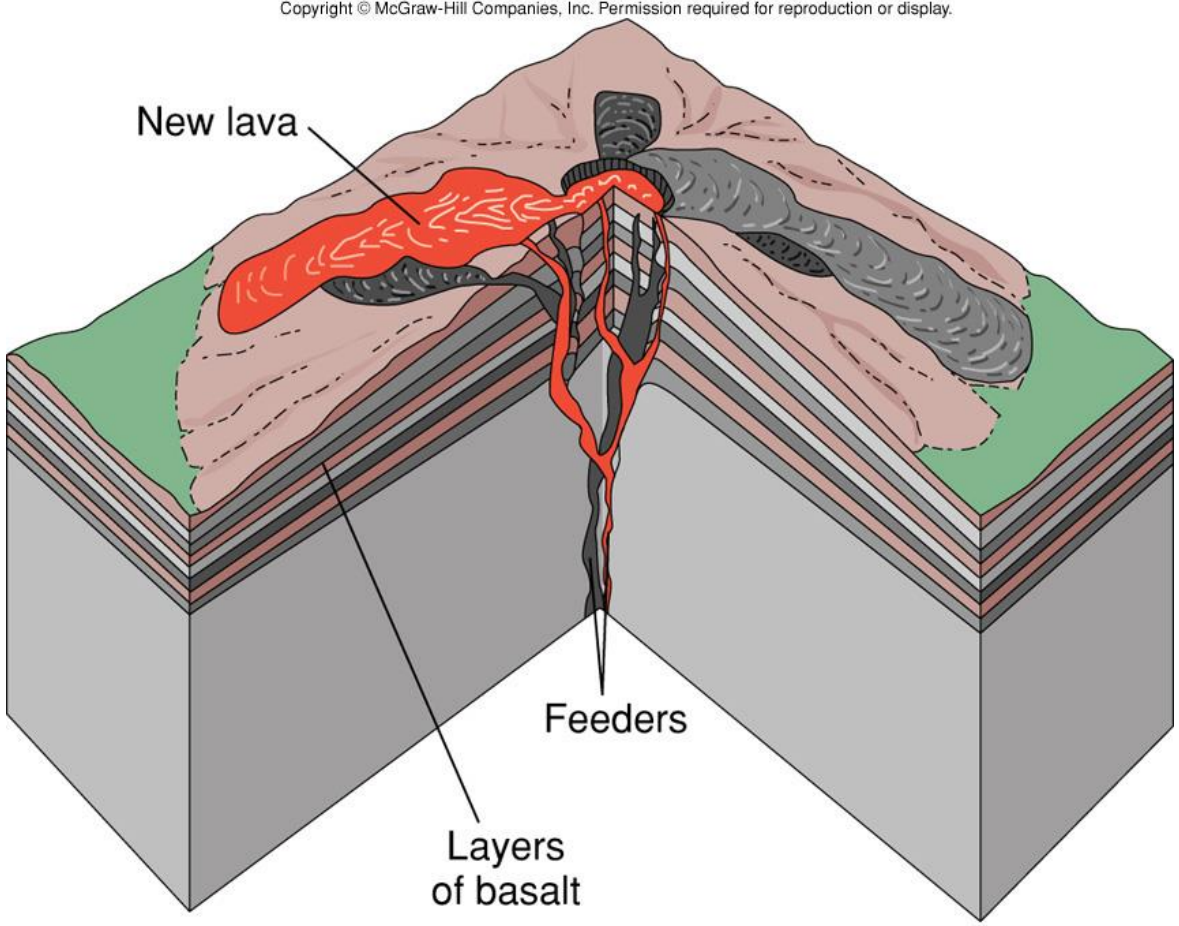
Plutonic





Crystallization

MAGMA



Volcanic

IGNEOUS

Plutonic

Crystallization

MAGMA

Weathering

Volcanic

IGNEOUS

Plutonic

Crystallization

Uplift

MAGMA

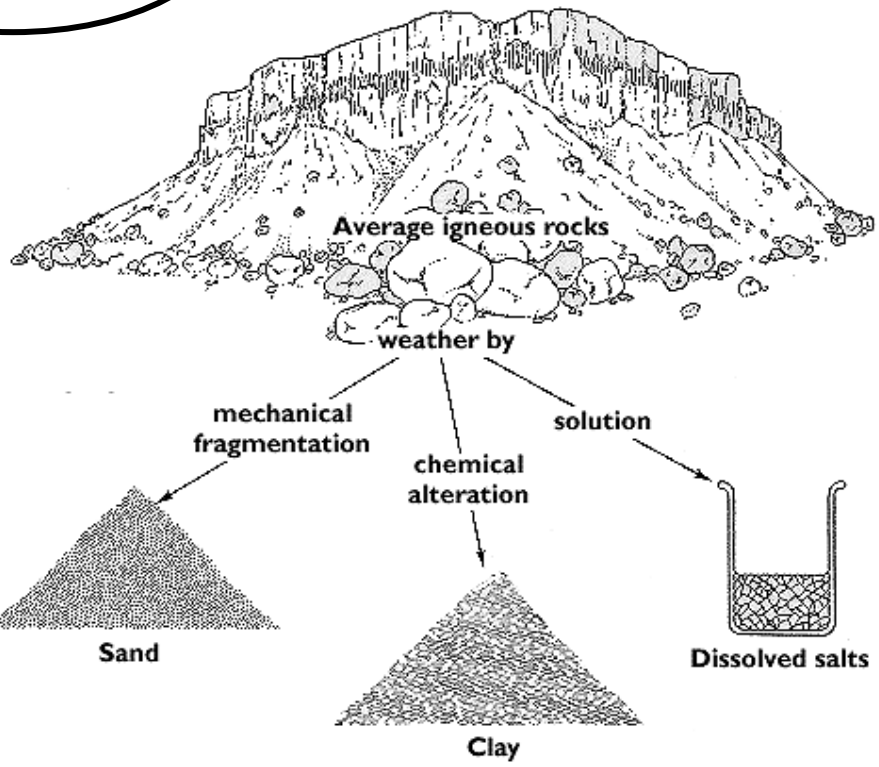
Weathering

SEDIMENT

Volcanic

IGNEOUS

Plutonic



Crystallization

Uplift

MAGMA

Weathering

SEDIMENT

Erosion

Transport

Deposition

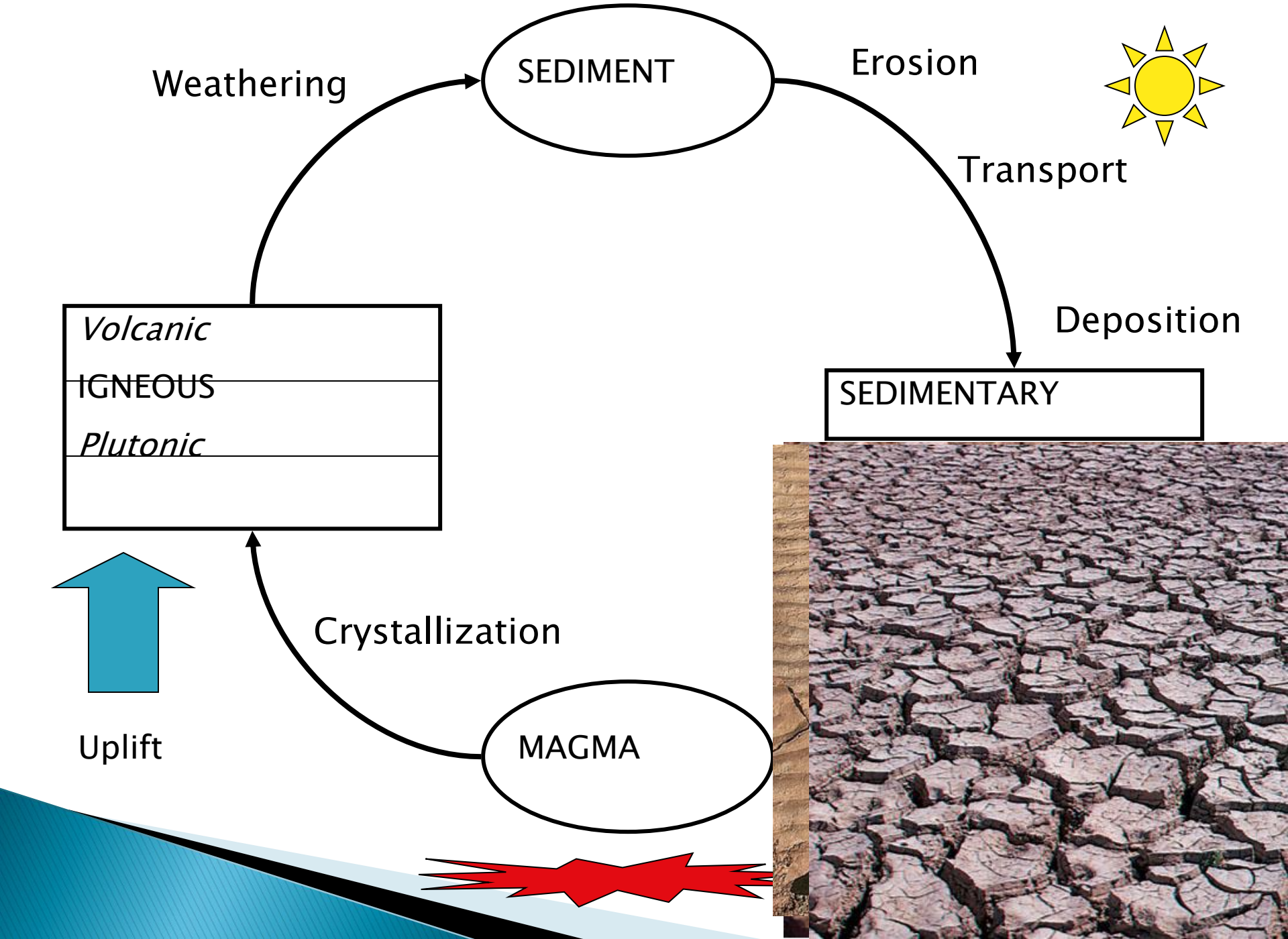
Volcanic

IGNEOUS

Plutonic

Crystall

Uplift


Weathering
SEDIMENT
Erosion
Transport
Deposition
SEDIMENTARY
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IGNEOUS
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Uplift
MAGMA

Rock Cycle Diagrams

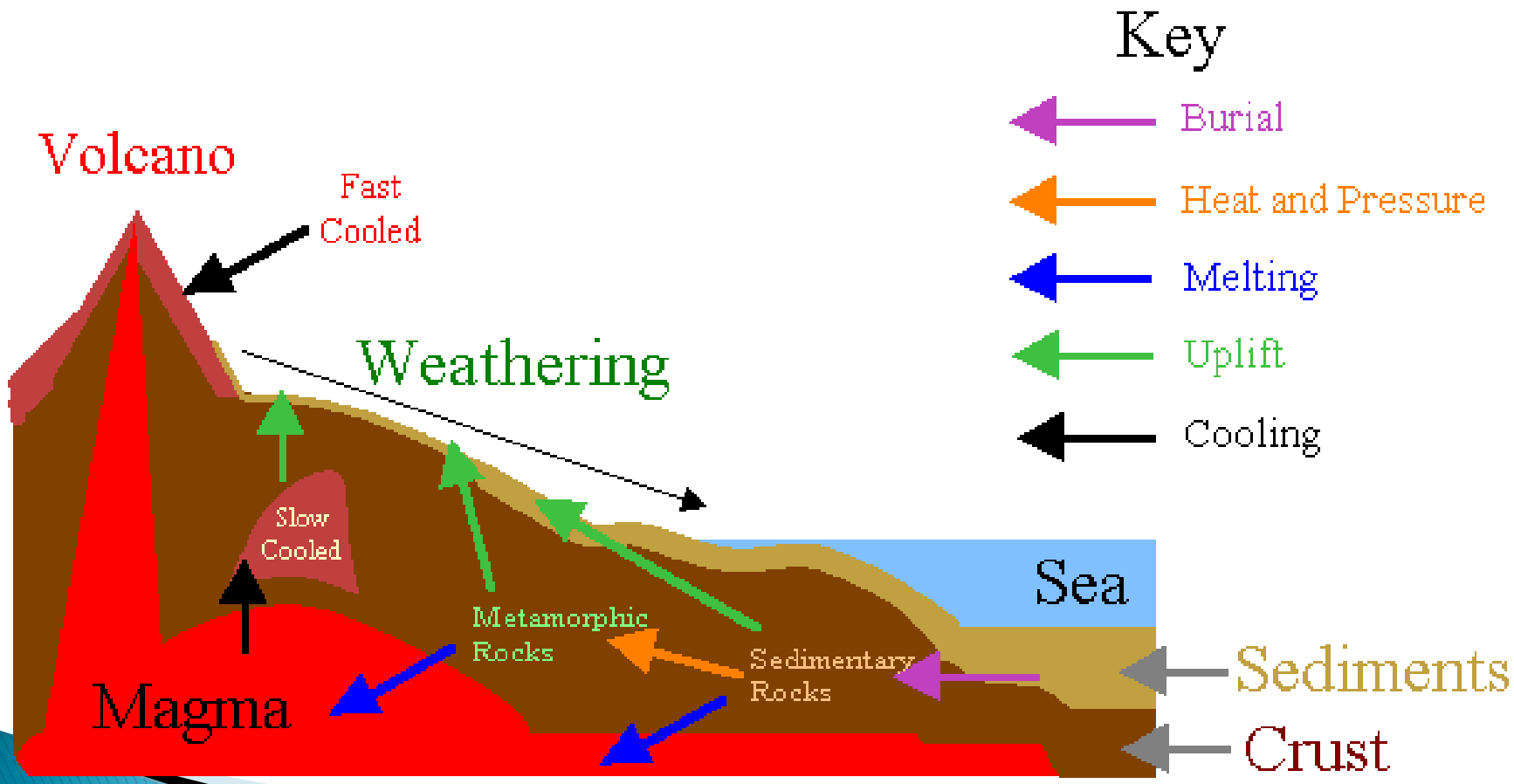
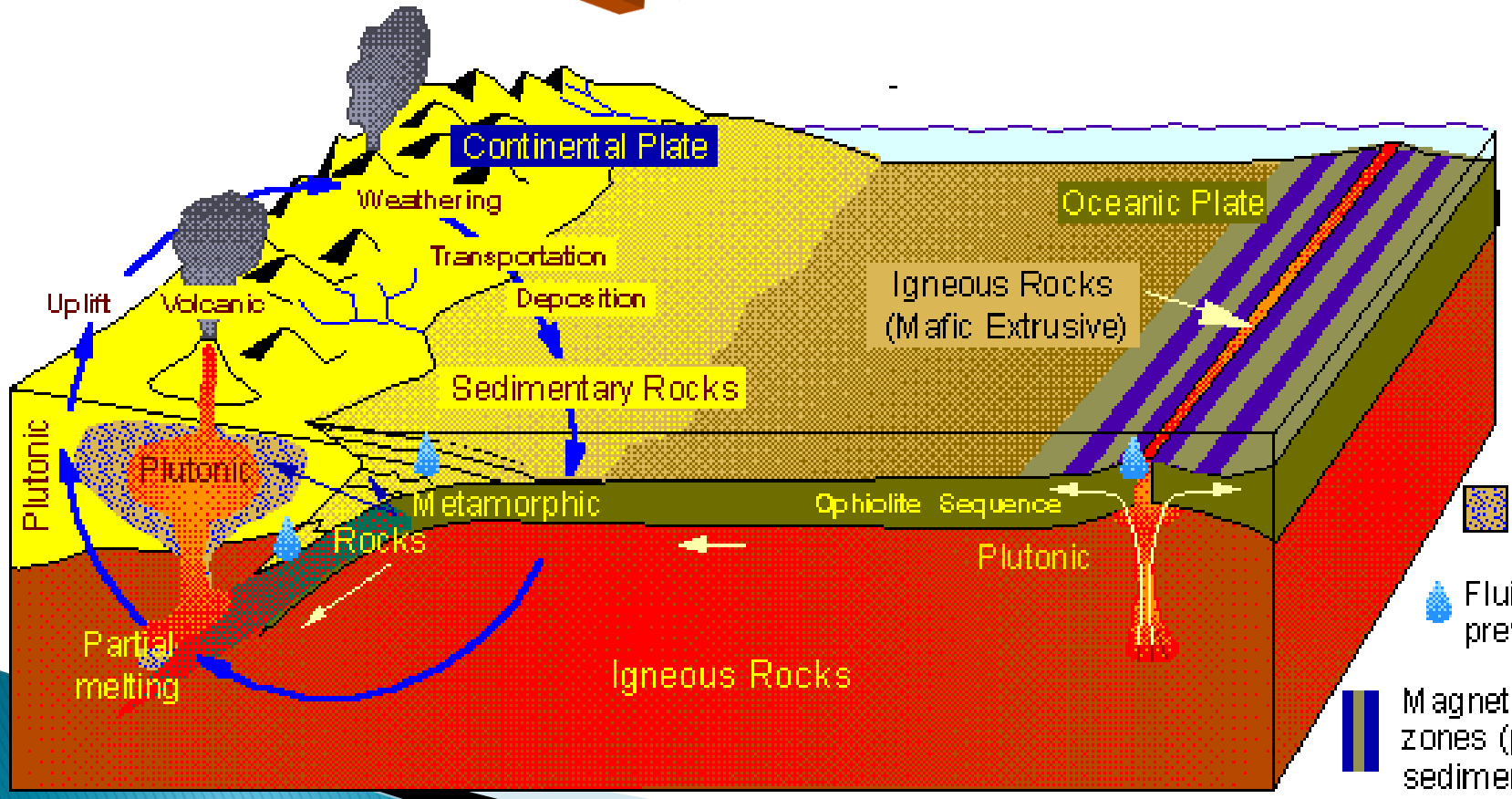
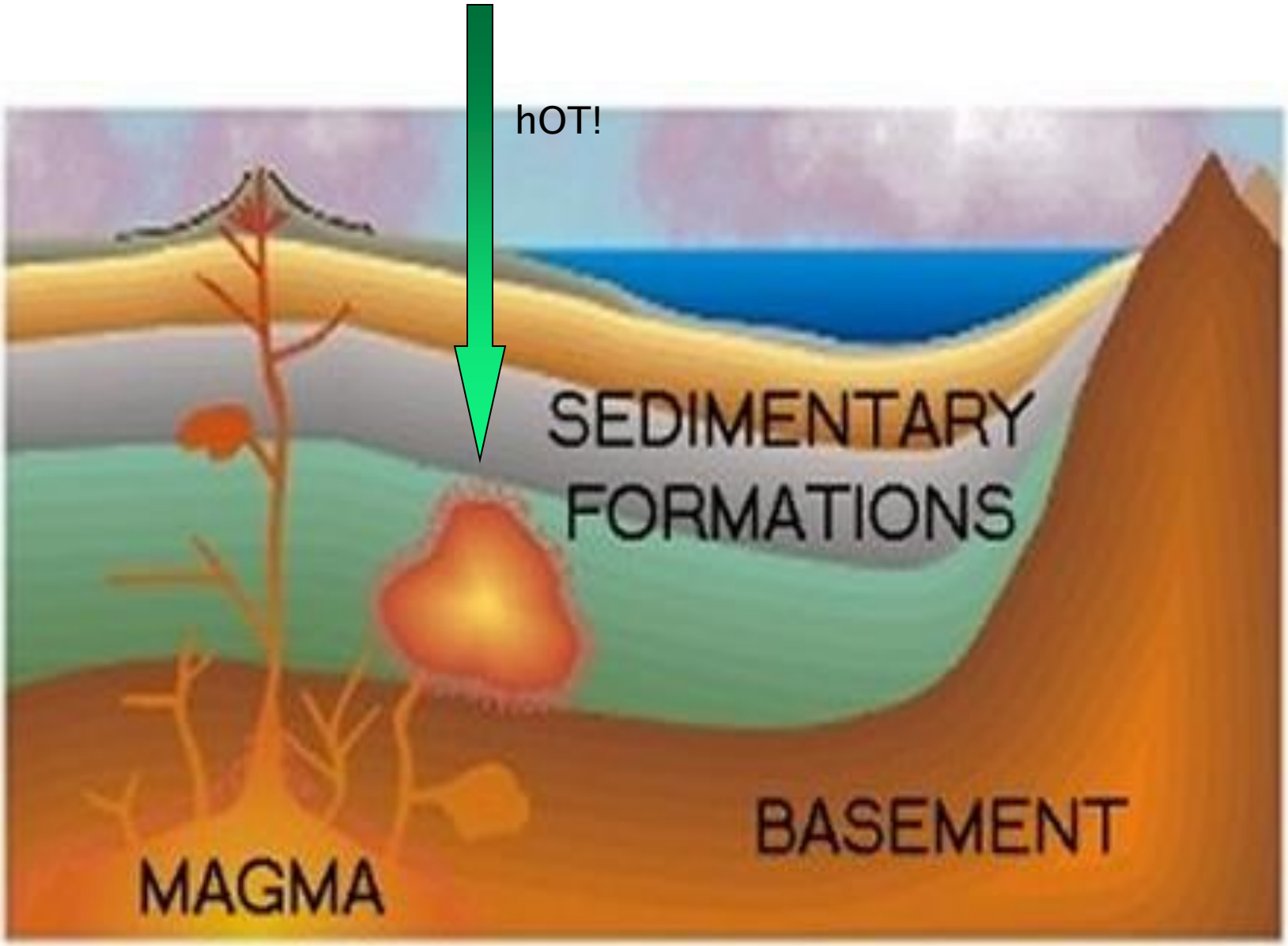


Plate TECTON-ics!



Redrawn by W. Milner, as modified Montgomery (1990) and Monroe and Wicander (1994).


hOT!
SEDIMENTARY
FORMATIONS
BASEMENT
MAGMA