

Sediments

- What Sediments Are
- How Sediment is Produced
- The Three Main Types of Sediment
- Detrital
 - Rocks
- Chemical
 - Halite, Gypsum, and Calcite
- Biochemical
 - Limestone, Coal, Chert



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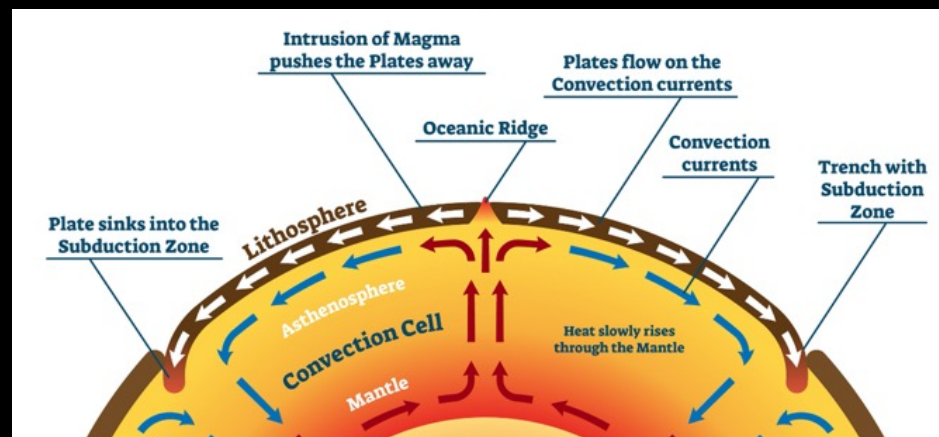
Sediment

- Definition: _____
- Sediment can consist of rocks and minerals, as well as the remains of plants and animals
- It can be as small as a grain of sand or as large as a boulder
- Sediment moves from one place to another through the process of erosion



What is Sediment?

- New earth is created as the mantle pushes new material up through a diverging plate boundary or lava comes up through volcanoes
 - This is where new rocks are made
 - _____
- i.e. Boulders → cobbles → pebbles → sand → mud



3 Main Types of Sediment

1. _____

- _____

2. _____

- _____

3. _____

- _____



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Detrital Sediment

- ---
- Note: A colloid is a substance that is microscopic and dispersed evenly throughout another substance...
i.e. A colloid is a mixture, not a solution
- ---
- Grain sizes are classified on the Phi Scale
- Colloids are anything less than a micrometer (10^{-6} m) and boulders are anything larger than 25 cm

The Phi Scale

ϕ scale	Size range (metric)	Aggregate class (Wentworth)	Other names
< -8	> 256 mm	Boulder	
-6 to -8	64–256 mm	Cobble	
-5 to -6	32–64 mm	Very coarse gravel	Pebble
-4 to -5	16–32 mm	Coarse gravel	Pebble
-3 to -4	8–16 mm	Medium gravel	Pebble
-2 to -3	4–8 mm	Fine gravel	Pebble
-1 to -2	2–4 mm	Very fine gravel	Granule
0 to -1	1–2 mm	Very coarse sand	
1 to 0	0.5–1 mm	Coarse sand	
2 to 1	0.25–0.5 mm	Medium sand	
3 to 2	125–250 μm	Fine sand	
4 to 3	62.5–125 μm	Very fine sand	
8 to 4	3.9–62.5 μm	Silt	Mud
> 8	< 3.9 μm	Clay	Mud
>10	< 1 μm	Colloid	Mud

Note: Some people don't consider boulders and cobblestones to be sediment because they are too large...



Pebbles



Beach Sand



Cobblestones on a road surface
in Imola, Italy.

Chemical Sediments

-

- So... Detrital sediments are non-dissolved rocks and particles
- And, Chemical sediments are created from dissolved minerals

Chemical Sediments

- The main components of chemical sediments are minerals
- _____
- Halite is salt $\rightarrow$ NaCl. When a rock is composed mainly of halite, we call it rock salt

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Chemical Sediments

- _____
- _____
 - Calcite has an interesting property that allows light to undergo double diffraction inside it
 - The U.S. Government is currently attempting to use it to create a cloaking device



Orange calcite



Calcite

Chemical Sediments

- The easiest way to find chemical sediments is to go to dried up lakes and streams
- _____
 - Note: table salt is often created by boiling seawater until only the rock salt is left behind

Biochemical Sediment

- _____
- They are formed from organic processes that involve living organisms producing the sediments
 - Example: These living organisms can be snails and clams whose discarded calcium carbonate shells can form limestone
- Examples include:
 - _____
 - _____
 - _____



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Limestone



1

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- As marine plants and animals die in the ocean, scavengers, waves or currents



Coal

- Coal is a hard rock which can be burned as a solid fossil fuel



Coal mining

Coal

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PREVIEW

2



- It is a sedimentary rock formed from
- As more organisms die and settle on top of the older organic matter, the temperature and pressure increase
- _____



Bituminous Coal



Coal miner in Britain, 1942

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Chert

- Chert can form as siliceous skeletons or silica-rich rocks dissolve, releasing silicon into the ocean water
- _____
- _____
- Note: Ancient people often relied on chert as the raw material for the formation of tools such as hide scrapers, drills, and spear points



Chert (dark bands) in limestone