Sedimentary Rock Is Formed from the Weathered and Eroded Remains of the Crust.

Many of the rock layers you can see in this photograph are produced by the weathering and erosion of crustal materials. What evidence should there be if you were asked to determine what kind of crust it was formed in?

Why Study Sedimentary Rocks?

- Reflect physical and chemical characteristics of source environments.
- Contains direct and indirect evidence of life.
- Can be interpreted to recreate Earth history.
- Source of "fossil fuels".

There Are Three Common Types of Sediment: Clastic, Chemical, and Biogenic.

- CLASTIC SEDIMENTS are broken pieces of crust deposited by water, wind, ice, or some other physical process.
- CHEMICAL SEDIMENTS produced by inorganic (nonbiological) precipitation of dissolved compounds (e.g., through evaporation).
- BIOGENIC SEDIMENTS produced by organic (biological) precipitation of the remains of living organisms.

Sediments change as they are transported across Earth’s surface... en route to their Environment of Deposition.

<table>
<thead>
<tr>
<th>Sedimentary Environment</th>
<th>Temperature</th>
<th>Sediment Size</th>
<th>Sorting</th>
<th>Transported Sediments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Desert</td>
<td>Hot</td>
<td>Gravel, Sand</td>
<td>Wavy</td>
<td>Mostly stones</td>
</tr>
<tr>
<td>Glacial</td>
<td>Cold</td>
<td>Ice, Snow</td>
<td>Abrupt</td>
<td>Mostly ice</td>
</tr>
<tr>
<td>Marine</td>
<td>Warm</td>
<td>Sand, Mud</td>
<td>Complex</td>
<td>Mostly organic remains</td>
</tr>
<tr>
<td>Fluvial</td>
<td>Cool</td>
<td>Sand, Gravel</td>
<td>Smooth</td>
<td>Mostly clastic</td>
</tr>
</tbody>
</table>

Particle Size Reflects Environmental Energy... sorting particles separated based on density.
Sediments evolve in Sedimentary Basins.

- Unstable grains (olivine, pyroxene, calcium-rich plagioclase, amphibole, and others) become less abundant.
- Stable grains (quartz, clays, muscovite, orthoclase) become more abundant.
- Biogenic sediments accumulate.
- Chemical sediments may become more abundant.

There Are Eight Major Types of Clastic Sedimentary Rock.

- Specific combinations of texture and composition for each type.
- Determined by sediment's history: transport energy and distance, weathering intensity, and composition of source rock.

<table>
<thead>
<tr>
<th>Type</th>
<th>Texture</th>
<th>Composition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conglomerate</td>
<td>Angular</td>
<td>Clay, silt, and gravel</td>
</tr>
<tr>
<td>Breccia</td>
<td>Angular</td>
<td>Clay, silt, and gravel</td>
</tr>
<tr>
<td>Gravels</td>
<td>Angular</td>
<td>Clay, silt, and gravel</td>
</tr>
<tr>
<td>Pebbles</td>
<td>Round</td>
<td>Clay, silt, and gravel</td>
</tr>
<tr>
<td>Pebble sandstone</td>
<td>Angular</td>
<td>Clay, silt, and gravel</td>
</tr>
<tr>
<td>Lithic sandstone</td>
<td>Sand</td>
<td>Clay, silt, and gravel</td>
</tr>
<tr>
<td>Siltstone</td>
<td>Fine</td>
<td>Clay, silt, and gravel</td>
</tr>
<tr>
<td>Shale</td>
<td>Fine</td>
<td>Clay, silt, and gravel</td>
</tr>
</tbody>
</table>

Clastic Sedimentary Rocks (8)
There Are 7 Major Types of Chemical Sedimentary Rock ...

- rock salt
- rock gypsum
- breccia
- travertine
- chert
- dolostone
- micrite

There Are 4 Major Types of Biogenic Sedimentary Rock.

- skeletal limestone
- chalk
- coal
- coquina

Sedimentary Rocks Preserve Evidence of Past Environments

Continental Environments of deposition

Coastal Environments of deposition

Marine Environments of deposition

Primary Sedimentary Structures Record Environmental Processes

#3. Choose four environments of deposition in this figure. For each, describe the texture and composition of the sediments you would be likely to find there.

#7. Consider the continental shelf, the streams for sand, and the glacial for each major grain size. Predict the texture and composition of sediments at each environment.