1. Effects of Climate - Materials on earth will weather at different rates according to the climate conditions. **Climate** is described in terms of temperature and humidity.
   - Areas of **low temperature** and **low precipitation** (Arctic) experience slow weathering rates.
   - Areas of **high temperatures** and **high precipitation** (Rain Forest) experience fast weathering rates.

2. Effects of Particle Size - As an object is cut, the insides as well as the outsides are exposed to be weathered from.

   - Which will weather more rapidly?

     ![Diagram of cubes](image)

     
     - Volume = $8 \text{ cm}^3$ for sides $4, 5, 6$
     - Surface Area = $24 \text{ cm}^2$

     - Volume = $8 \text{ cm}^3$ for sides $1, 2, 3, 4, 5, 6$
     - Surface Area = $48 \text{ cm}^2$

     - As particle size decreases from the cuts, surface area increases.

3. Mineral Composition - Rocks of different mineral compositions will weather at different rates. Some minerals such as calcite are "soft". Minerals like **Quartz** or **Feldspar** are "harder" (ESRT p.16).

   - What are you going to choose as a building material, calcite marble or feldspar granite?

   - The harder mineral is Granite. Harder= weathers Slower

4. Pollution Concentration - Weathering rates are higher for objects having a close proximity to a pollution site. Pollution in the air causes rain to be more *Acidic*.

   - **pH Scale:**
   
<table>
<thead>
<tr>
<th>pH</th>
<th>Acid</th>
<th>Neutral</th>
<th>Base</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td></td>
<td>x</td>
<td>7</td>
</tr>
<tr>
<td>14</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

   - x - rain water is slightly acidic at pH of 5-6.
Soil Horizons

Weathering, leaching, and organic processes gradually change exposed bedrock into a mature soil.

What forms of physical weathering in NYS would be breaking down the rock into soil?
- Frost Action
- Root Action - Biological
- Arasion - wind, water, ice, gravity

What forms of chemical weathering in NYS would be breaking down the rock into soil?
- Acid Rain
- Hydrolysis
- Oxidation

Leaching – infiltrating water will dissolve minerals out of the top layers and gravity pulls it deeper into the horizon (zone B).

Most of the soils of New York State do not show the complete development of the soil horizons. The well developed soils that may have been here were carried away by the last continental ice sheet (Glaciers) over 10,000 years ago.