



# **WEATHERING**

**Weathering** is the disintegration and decomposition of material at or near the surface.

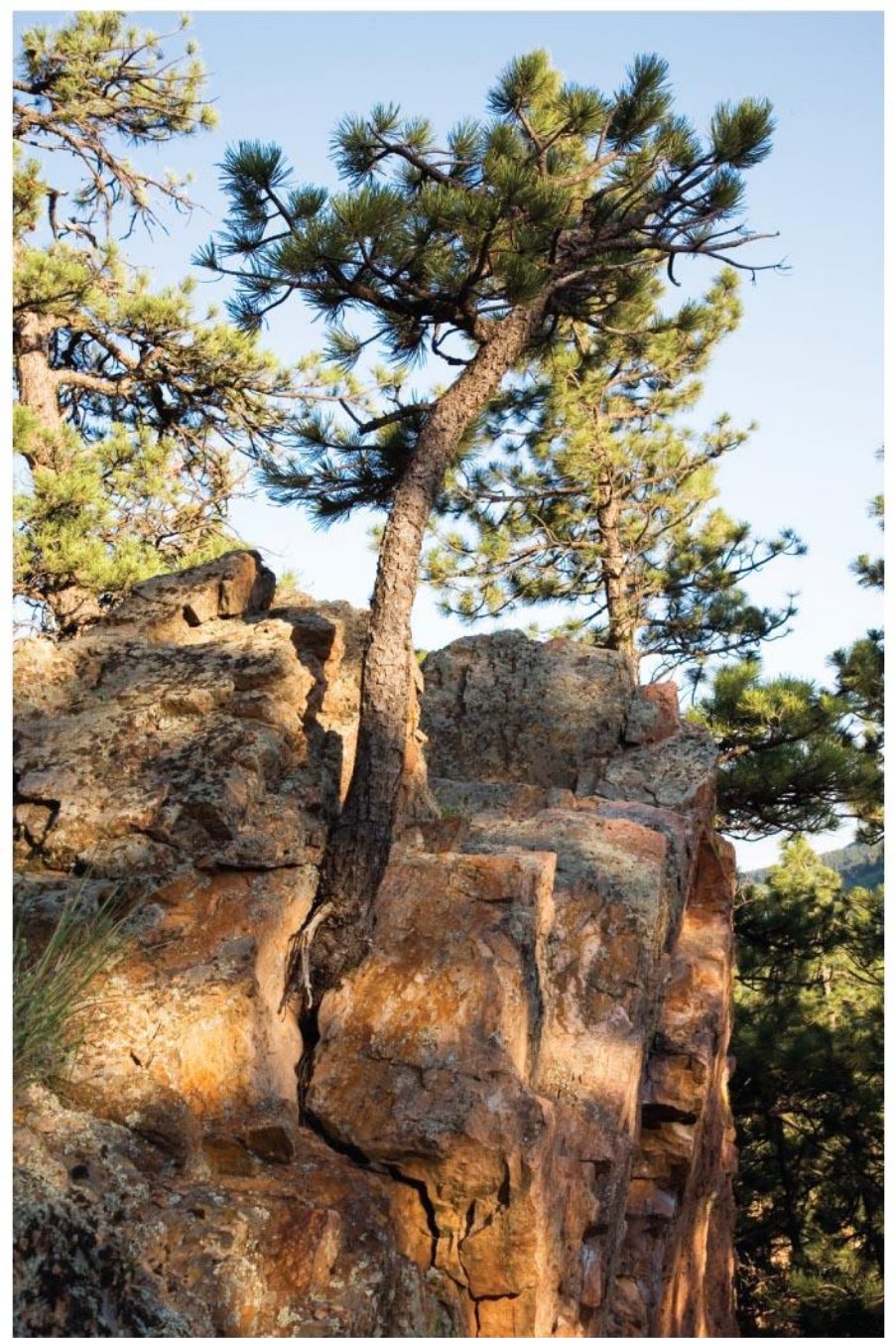


# Weathering

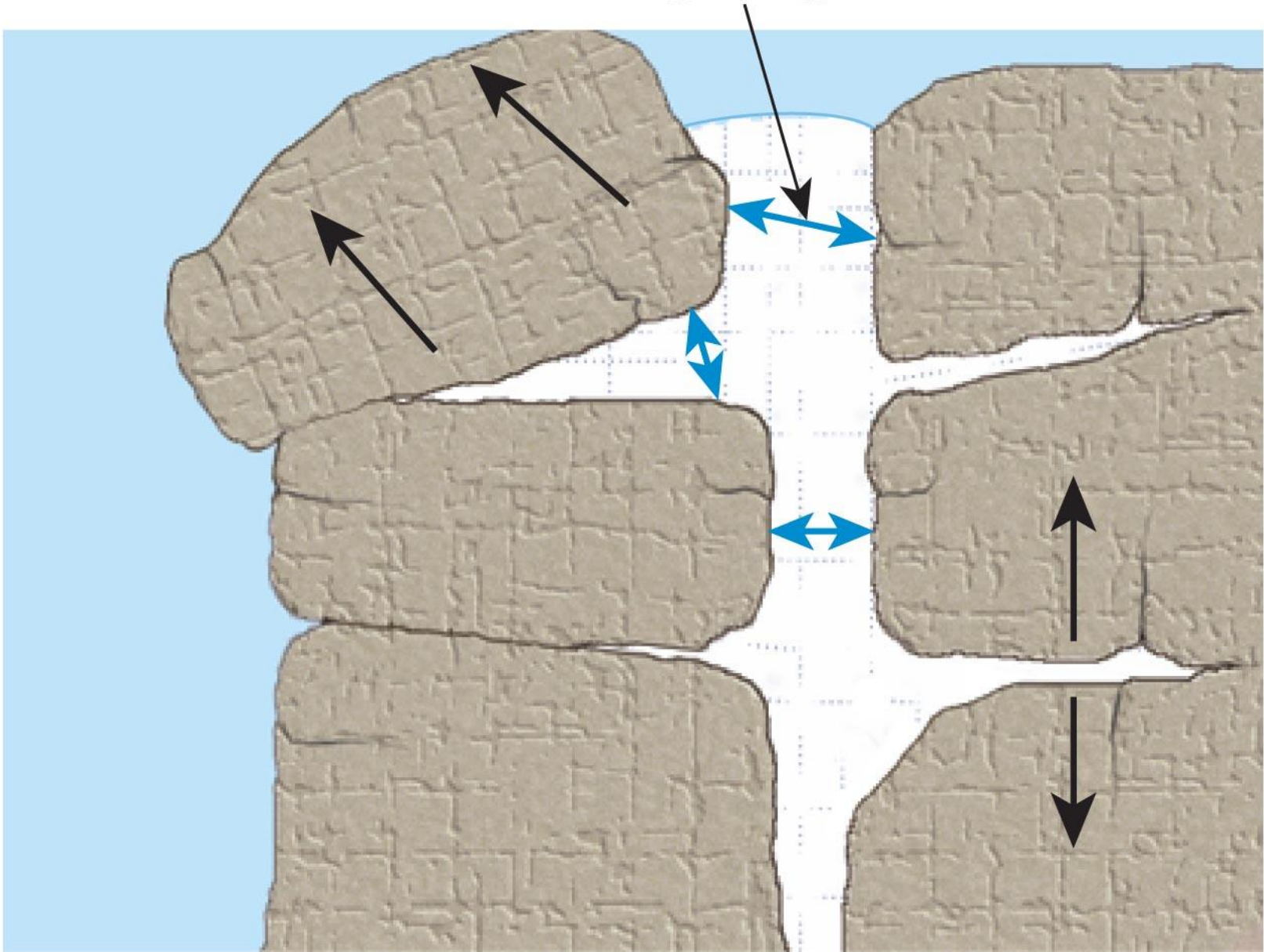
Two types:

**Physical**

**Chemical**



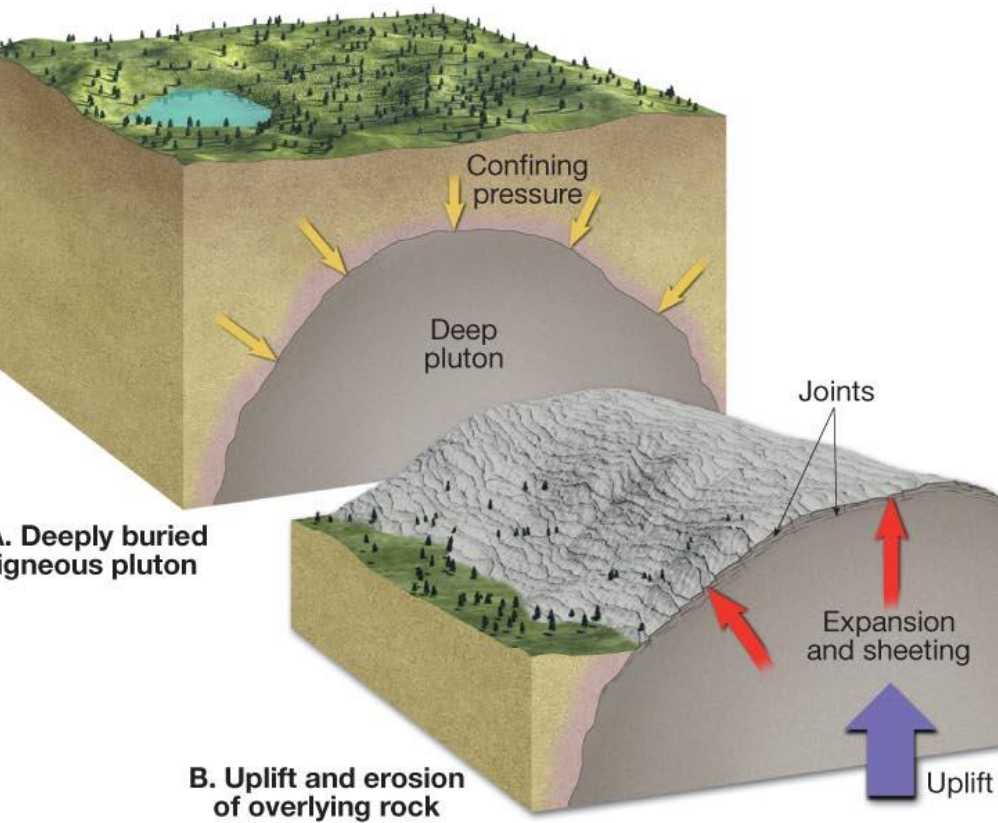
# Frost wedging



# Talus Slope

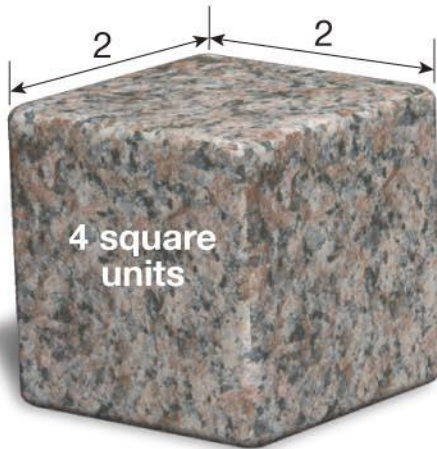


# Exfoliation Dome

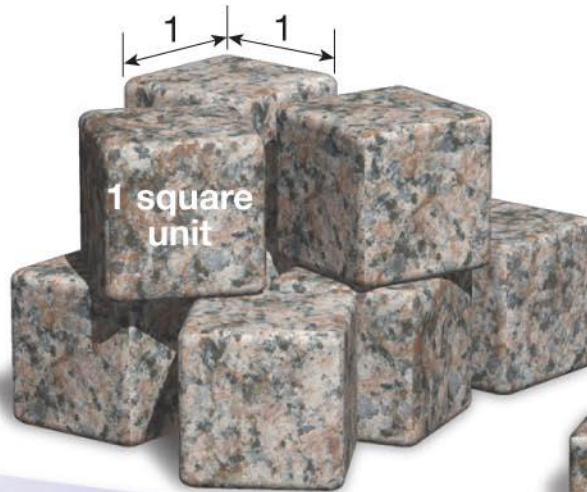


C. Exfoliation dome

$$\begin{array}{l} 4 \text{ square units} \times \\ 6 \text{ sides} \times \\ 1 \text{ cube} = \\ \hline 24 \text{ square units} \end{array}$$



$$\begin{array}{l} 1 \text{ square unit} \times \\ 6 \text{ sides} \times \\ 8 \text{ cubes} = \\ \hline 48 \text{ square units} \end{array}$$



$$\begin{array}{l} .25 \text{ square unit} \times \\ 6 \text{ sides} \times \\ 64 \text{ cubes} = \\ \hline 96 \text{ square units} \end{array}$$



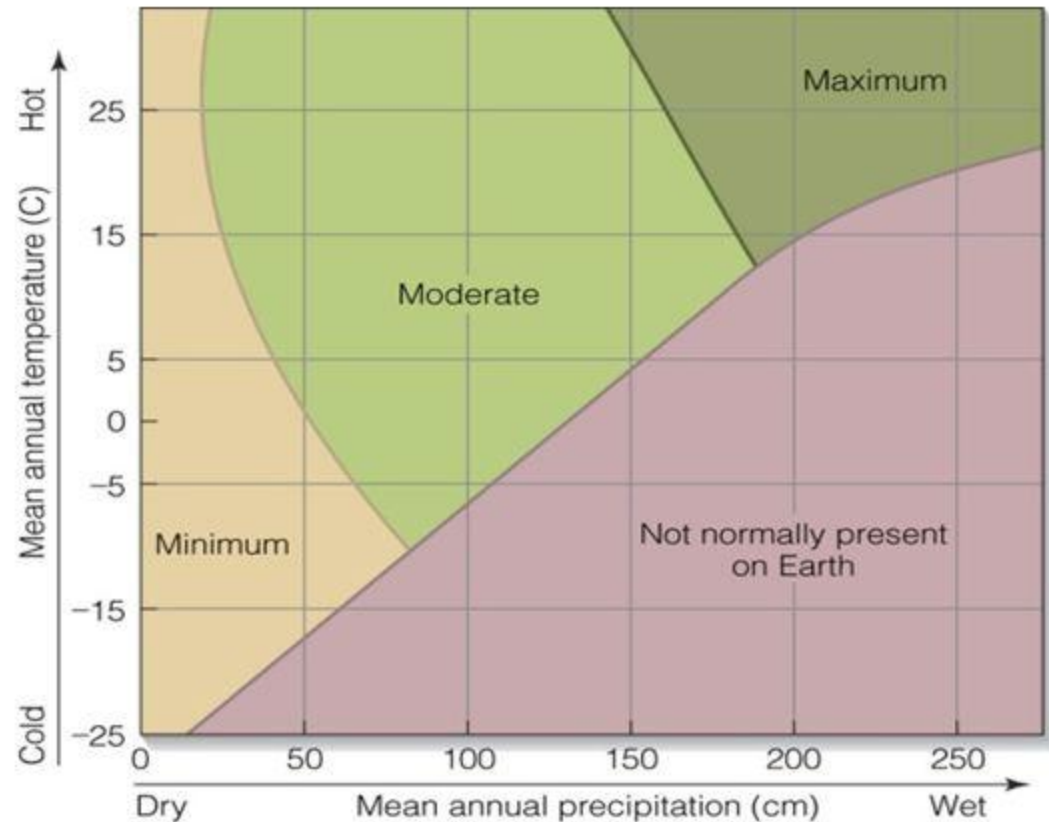
*Increase in surface area*

# Chemical Weathering – Decomposition of Earth Materials

- **Chemical weathering processes include**

- **Solution**
- **Oxidation**
- **Hydrolysis**

- **Hot and wet environments accelerate chemical weathering.**



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- **Chemical weathering occurs in all environments, except, possibly, permanently frozen polar regions.**

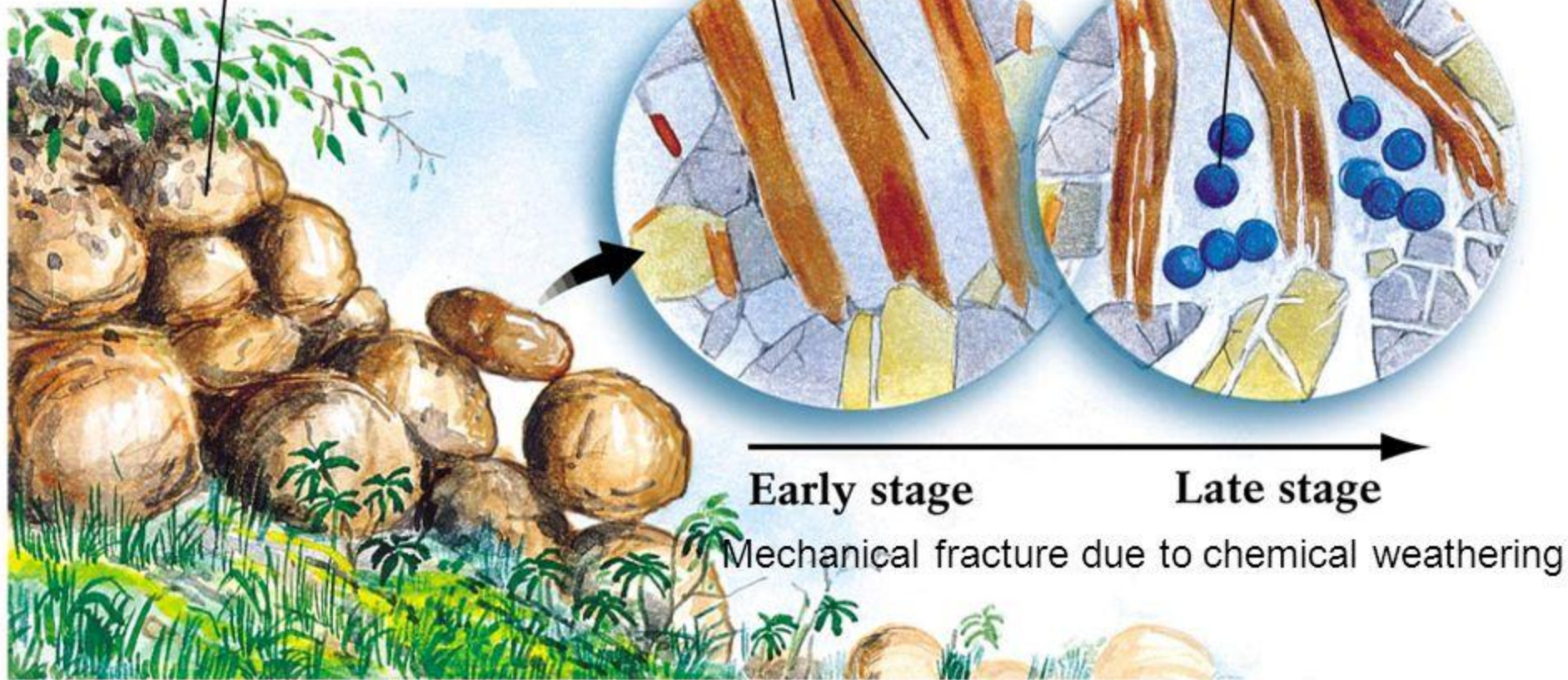


# Hydrolysis – Feldspar to Clay

Concentric layers of weathered rock at surface of each boulder

Feldspars become Clay mineral layers

Absorbed water molecules cause clay layers to expand, pushing other layers apart

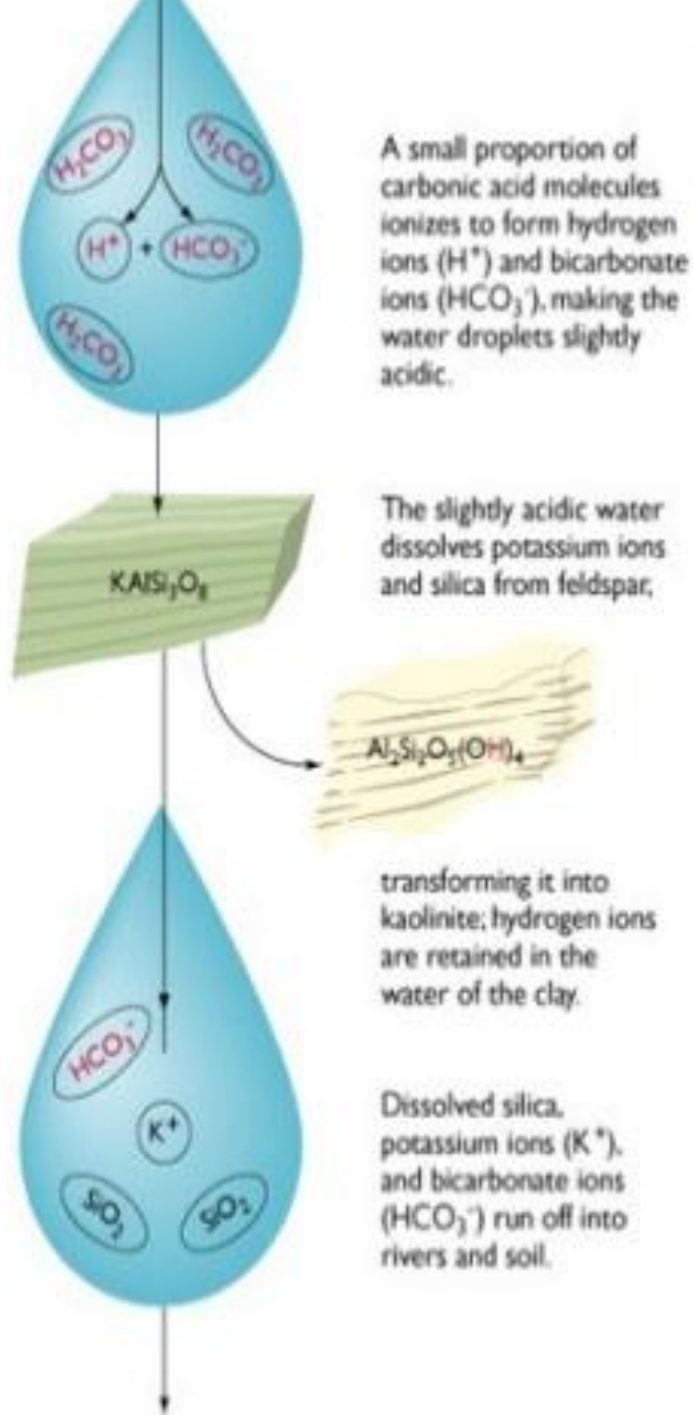


# Hydrolysis



**Feldspar + carbonic acid**  
**+ H<sub>2</sub>O**  
**= kaolinite (clay)**  
**+ dissolved K (potassium)**  
**ion**  
**+ dissolved bicarbonate ion**  
**+ dissolved silica**

**Clay is a soft,**  
**platy mineral, so**  
**the rock**  
**disintegrates**



# Oxygen reacts to form oxides like rust



# Quartz Becomes Sand (Mechanical)



# Paper Beats Rock...



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Photograph by Michael Mefford

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