5-Minute Refresher: WEATHERING AND EROSION

SIEMENS | Foundation

Discovery EDUCATION

SIEMENS STEM DAY Science Technology Engineering Math

Weathering and Erosion- Key Ideas

- Weathering is the wearing away of the surface of rock, soil, and minerals into smaller pieces.
- Example of weathering: Wind and water cause small pieces of rock to break off at the side of a mountain.
- Weathering can occur due to chemical and mechanical processes.
- Erosion is the movement of particles away from their source.
- Example of erosion: Wind carries small pieces of rock away from the side of a mountain.

SIEMENS STEM DAY | Science Technology Engineering Math

Weathering- Chemical and Mechanical Processes

- **Chemical Weathering**:
  - Decomposition of rock and soil due to chemical reactions.
  - Examples: acid rain wears away statues and buildings, oxidation causes metals to rust
- **Mechanical Weathering**:
  - Decomposition of rock and soil due to mechanical forces (pushes and pulls).
  - Examples: wind, water, ice/frost, gravity, compression and contraction of materials due to heat

SIEMENS STEM DAY Science Technology Engineering Math

Weathering and Erosion- Effects

Effects of weathering and erosion:

- Cause changes in the slopes and texture of rock structures, hills, and valleys
- Can cause landslides
- Cause buildings, statues, and roads to wear away
- Can wash soil, pollutants, and harmful sediment from the roads and farms into waterways
- Cause metals to oxidize (rust)
- Reduce the area of a beach or shoreline

SIEMENS STEM DAY | Science Technology Engineering Math

Weathering and Erosion- Learning Objectives for Grades K - 3

- Different things in the environment around us can cause changes to the way objects look or feel.
- Water, wind, and ice can make objects, such as rocks, break into small pieces.
- Water, wind, and ice can also move pieces of rock or land to new places.

SIEMENS STEM DAY | Science Technology Engineering Math

Weathering and Erosion- Learning Objectives for Grades 4 - 6

- The wearing away of a surface of rock or soil is called weathering.
- Weathering breaks things down into smaller pieces.
- The movement of pieces of rock or soil to new locations is called erosion.
- Weathering and erosion can cause changes to the shape, size, and texture of different landforms (such as mountains, riverbeds, beaches, etc).
- Weathering and erosion can also play a role in landslides and the formation of new landforms.

SIEMENS | Foundation Discovery EDUCATION

SIEMENS STEM DAY | Science Technology Engineering Math

Weathering and Erosion- Prior Knowledge for Grades K - 3

- Students have most likely experienced the forces from different natural processes before. For example, they have probably felt a strong wind blow, or they may have felt a current in a river or ocean. Students can think about what effect these forces would have on other objects, such as rocks.
- Most students have observed the effects of wind and water on objects around them. Examples: sandcastles being washed away by the ocean, leaf piles blown away by wind, snowman melting in the rain, etc.

SIEMENS | Foundation Discovery EDUCATION

SIEMENS STEM DAY | Science Technology Engineering Math

Weathering and Erosion- Prior Knowledge for Grades 4 - 6

- Students should understand the difference between physical and chemical reactions.
- Students should have a general understanding of various landforms, such as mountains, rivers, and beaches.
- Most students have observed the effects of physical and chemical weathering before. Examples: rust on a bicycle, chalk washing away on a side walk, stones smoothed in a river, etc.

SIEMENS STEM DAY | Science Technology Engineering Math

Weathering and Erosion- Common Misconceptions

- Weathering is the same as erosion.
  - **Reality:** Weathering is related to the breaking down and loosening of rock or soil into smaller pieces, but the weathered pieces remain in place. Erosion is related to the *movement* of weathered (and sometimes non-weathered) pieces away from the source.

- Erosion is the process by which weathered particles are deposited into a new location.
  - **Reality:** Erosion is the movement or transport of particles, but it does not involve the settling and accumulation of particles in a new location. The process by which particles accumulate in a new location is called deposition. Deposition is responsible for creating sand dunes and some mountains.

SIEMENS STEM DAY Science Technology Engineering Math

Weathering and Erosion- Additional Information

For more information about weathering and erosion, watch the video at the following link:

http://siemensscienceday.com/activities/weathering_cubes.cfm

SIEMENS Foundation Discovery EDUCATION