**“Weathered”** Jacob Duvall

Time: 1 Class Periods (50 minutes)

Grade Level: 6th

**Materials:**

**-Clipboards -Handouts -Pencils -A School Building or Manufactured Building of Some Kind**

**Background**:

There are 2 different types of weathering that the students will have learned about at this point in the unit: Mechanical and Chemical. Mechanical weathering includes things such as abrasion, freezing and thawing, and thermal expansion. Chemical weathering involves an actual chemical change in a rock or structure that is causing the weathering, such as rust (oxidation) or disintegration by acid precipitation. This lesson will provide students with a chance to explore these two types of weathering in the setting they find themselves everyday: the school building. The process of weathering takes years, decades, centuries and beyond—so comparing the process of specific weathering to the age of the school building will help students conceptualize the timescales of geological weathering are.

**North Carolina Essential Science Objectives:**

**6.E.2: *Understand the structure of the Earth and how interactions of constructive and destructive forces have resulted in changes in the structure of the Earth over time and the effects of the lithosphere***

**Objectives:**

**I CAN** find real-life examples of weathering

**I CAN** explain the difference between mechanical and chemical weathering

**Vocabulary:**

-Mechanical Weathering -Chemical Weathering -Oxidation -Acid Precipitation -Abrasion -Erosion

**Essential Question:** “What are the different ways weathering occurs on Earth?”

**Engage: (5-10 Minutes)**

**Do-Now:** 1- Why do they put cracks in sidewalks every few feet?

2- If humans go extinct, what well eventually happen to all of our buildings and cities?

[Give students a few minutes to respond][Take Responses] The first question will serve to explore a common feature most students are familiar with, but likely don’t realize is related to science, or more specifically, to weathering. “Stress Joints” are placed in sidewalks and concrete areas because concrete expands with warmer temperatures and shrinks when the temperature drops. These joints allow this expansion and contraction without the concrete cracking. This a discussion point that can then be reinforced later in the lesson when the class is outside and can see these “stress joints” for themselves.

The second question will help generate conversation about all of the different ways in which weathering and erosion affect the world around us. With no humans around to keep up maintenance, students then must consider what would happen to buildings over a long enough time period. Freezing and thawing of structures. Plants and animals affecting structures. Chemical changes caused by acid rain, oxidation, and exposure to the elements. Eventually, all the buildings in the world would fall.

**Explore: (10 Minutes)**

**Watch a clip from the following video: (life after people)** [**https://www.youtube.com/watch?v=Y8aLKHShv9o**](https://www.youtube.com/watch?v=Y8aLKHShv9o)

The next ten minutes will be used to review the content necessary for this lesson, namely the two types of weathering, mechanical and chemical. This can be reinforced through the notes taken prior to this lesson on weathering and the rock cycle.

**In brief:**

• Chemical weathering happens when there is change in the composition of rocks through chemical processes and form residual materials. Processes include oxidation, dissolution, and hydrolysis.

• Mechanical weathering occurs when there is only physical change in rock structure such as size and shape through physical forces of nature. Processes include exfoliation, abrasion and freeze and thaw weathering.

• Climate is an important factor for weathering to take place. Cold temperatures favor mechanical weathering while warm temperatures support chemical weathering.

**Explain: (25 Minutes)**

Students will work in pairs or groups of 3 outside to find examples of weathering around the school building. For example, broken sidewalks would count as one instance of weathering, or a rusting fence. Students will have to cite the location of the weathering, determine what type it is (mechanical or chemical), provide detail about the wreathing occurring (is it freeze and thaw or abrasion), estimate the age of the structure, gauge the extent of the weathering, and then repeat the process for each example of weathering they find. They will use the following table to compile their data:

| **Location:** | **Location:** |
| --- | --- |
| **Extent of Weathering: (low) 1 2 3 4 5 6 7 8 9 10 (worst)** | **Extent of Weathering: (low) 1 2 3 4 5 6 7 8 9 10 (worst)** |
| **Type of Weathering:** | **Type of Weathering:** |
| **Building Material:** | **Building Material:** |
| **Approximate age of structure:** | **Approximate age of structure:** |
| **Description of Weathering:** | **Description of Weathering:** |

**Elaborate: (During outside portion of the lesson)**

Students will be given 5 minutes at each “location” around the school to ensure that they stay together and don’t become separated from the class. Resources and teacher aides will be made aware of the lesson and used to chaperon this portion as well.

While students are collecting data, I will be engaging with each group to check understanding and to elaborate on the content with actual examples to reinforce the lesson’s objectives. This time can be used to ask extending questions, and to reteach any confusing aspects of the material.

**Evaluate**: **(Post Lesson)**

Lab handouts will be collected for a grade and graded for accuracy in terms of qualifying what type of weathering it is the students have identified (mechanical vs chemical). There will also be formative assessment occurring while the students are conducting their “searches” for weathering outside.