Name:
Date:
Class period:

Vocabulary List:

- Mineral: a solid substance that is crystalline, inorganic, has a fixed chemical composition, and is naturally occurring.
- Rock: a solid substance that is an aggregate of one or more minerals.
  - Igneous: a rock created from a melt of lava or magma that cooled and solidified.
    - Intrusive: an igneous rock that solidified underground, usually coarse grained.
    - Extrusive: an igneous rock that solidified at the Earth's surface, usually fine grained.
  - Sedimentary: a rock created from sediments (particles or precipitates) that compacted and formed a rock.
  - Metamorphic: a rock that has been chemically and/or physically altered by heat, pressure, and motion to change into a new rock.
- Intermolecular forces: forces that keep molecules together.
- Weathering: the breakdown of rocks over time, usually through contact with weather (mainly rain and wind).
- Biota: living organisms (either locally or globally).

Part 1: Visual assessment

Making observations about an object or area of interest is the first step to understanding it.

Task: List three things you observe about the Stone Pavilion and the rocks within it. Be sure to make one of your observations about the large rocks surrounding the Stone Pavilion.

1)

2)

3)

How a rock withstands to change over time can indicate how hard it is. Weathering is the breakdown of rocks and minerals over time through contact with the weather, other rocks, and biota. There are three different types of weathering:

- physical (friction, freezing and thawing, etc.),
- chemical (ions dissolving when in contact with water, oxidation, etc.)
- biological (animals burrowing, roots breaking up soil, etc.)

A rock that is weathered can have cracks, worn-down faces and edges, or be stained a different color.

Task: Identify three rocks from the display which have undergone weathering. Observe the rocks and fill out the table below. Be sure to **label** your sketch to indicate where weathering has taken place.

Rock number	Physical description	Evidence of weathering	Sketch

Task: Observe the rocks nearby the Stone Pavilion. Choose one that you think has experienced a substantial amount of weathering. **Draw** a simple sketch in the box below. Label two examples of weathering on this rock.

Part 2: Analysis

Some rocks are more resistant to weathering than others. Let’s try to figure out why.

Task: What weathering patterns do you notice in your data? I.e. Do any rocks have similar features that you think resulted from weathering (stains, worn edges, etc.)? **Write down two patterns,** and what you think caused that weathering (oxidation, friction, etc.).

Rocks can vary greatly in strength—some are hard enough to scratch glass or metal, while others are so soft they crumble in your hands. Think of it this way: just like a house is only as strong as the materials and design used to build it, a rock's strength depends on what it's made of and how its parts are put together. This wide range in strength comes down to the rock's chemical composition and the internal structure of its minerals, including the types of chemical bonds holding them together.

Rocks that have undergone more weathering are generally weaker than those that haven't. Weathering breaks down the minerals and weakens the rock's structure. Harder rocks are stronger because they have tougher bonds or a more solid internal structure.

Part 3: Bond strength

Task: Pick **three rocks in the pavilion**, then:

- Use context clues and deductive reasoning to inform your **categorization** of each rock as either **weathering-prone** or **weathering-resistant**. **List** them below in the appropriate category.
- For one of each rock type, **explain** why you categorized it as such.
- **Write** down what you can **infer** about the **bond strength** or internal structure of the rock based on its categorization as weathering-prone or weathering-resistant.

Rock number:	Prone or resistant?	Evidence/explanation:	Inferences about bond strength:

Statement of Authorship

I, Mary Ferguson, an undergraduate at the University of Connecticut, designed and created this content as an independent study. I used materials found on the Stone Pavilion website to assist in the creation of this content. Dr. Robert Thorson assisted me in finding additional materials for the Stone Pavilion. Meghan Kinkaid assisted in the development of this content.

<u>A note for teachers:</u>

Thank you for using this worksheet and (hopefully) the accompanying slideshow. While it would be beneficial for students to see the Stone Pavilion in person, I understand that field trips are not always possible for a variety of reasons. The slideshow is for those exact cases.

I fully encourage you to make a copy of these materials and edit them in any way you see fit. My hope when creating these was to make them as easy to implement as possible, so if you have any feedback or changes you think would be beneficial, please feel free to reach out to me at mary.ferguson@uconn.edu. For more general questions about the Stone Pavilion please reach out to Dr. Robert Thorson at robert.thorson@uconn.edu.