Day 1:

Stage 1: Desired Results

<table>
<tr><td colspan="2">Established Goals:
• PS 2.1d: Observe, investigate and record examples of physical and chemical weathering.</td></tr>
<tr><td>Enduring Understandings:
Students will understand that:
• Chemical weathering occurs when chemical reactions dissolve or alter the minerals in rocks and transform them into different minerals.
• Oxidation is a type of chemical weathering.
• Acids are involved in chemical weathering.
• Hydrolysis is an example of chemical weathering involving water.
• Physical weathering involves physical changes in such as shape or size.
• Ice wedging, temperature change, and root action are examples of physical weathering.</td><td>Essential Questions:
• What is physical weathering?
• What is chemical weathering?
• Explain the differences between physical and chemical differences.
• Describe an example of chemical weathering.
• Describe an example of physical weathering.
• Where do you see examples of chemical and physical weathering in your own lives?</td></tr>
<tr><td></td><td>Students will be able to:

• Identify the similarities and differences of physical and chemical weathering.
• Define physical and chemical weathering.
• Give examples of physical and chemical weathering.</td></tr>
</table>

Stage 2: Determine Evidence for Assessing Learning

<table>
<tr><td>Performance Tasks:
• After viewing a PowerPoint presentation comparing and contrasting chemical and physical weathering students will work with a partner to complete a Venn Diagram.
• Teacher will judge performance by classroom circulation.
• Teacher will collect the Venn diagrams to assess understanding of the two types of weathering prior to tomorrows experiment.</td><td>Other Evidence:
• Students will be given a homework assignment to find an example of both physical and chemical weathering in their own lives.
• Students will apply what they learned to perform an experiment .</td></tr>
</table>

Stage 3: Learning Plan

Learning Activities:

1. The teacher will tell the class that today they are beginning a new unit of study where they will learn about the interactions of air, water, and land.
2. The teacher will have the students work with a partner to complete a Venn diagram comparing and contrasting physical and chemical weathering.
    - Partners will be pre-decided by the teacher: pairing students at a higher reading level with students at a lower level to ensure optimal comprehension.
    - Students can draw pictures and symbols on the organizer as well as words. (students who have trouble writing or synthesize information differently)
3. Teacher will play the Powerpoint presentation on chemical and physical weathering.
4. Students will be instructed that they have 10 minutes to complete the Venn diagram together with their partner.
    - Teacher will circulate the room during this time to assess student understanding of the two processes and answer questions students may have.
5. Students will share their learning from their Venn Diagrams and fill in information they may have missed.
6. Students will reflect on their learning in their science journals. Three students will be invited to share their learning.
7. The teacher will inform students of their homework assignment, and explain to the students that tomorrow they will be performing an experiment where they will observe and record examples of both types of weathering.

Day 2:

Stage 1: Identify Desired Results

Established Goals: PS 2.1.d Observe, investigate, and record examples of physical and chemical weathering.	
Enduring Understandings: *Students will understand that* • Vinegar and Water are used in chemical weathering.	Essential Questions:

Stage 2: Determine Evidence for Assessing Learning

Performance tasks:	Other Evidence:
• Students will perform an experiment that shows examples of chemical and physical weathering. • Students will complete a worksheet recording the effects of water and vinegar on different rocks. • Students will complete one Group worksheet outlining their observations.	• Students will share three things they learned about weathering with their class. • Students will answer questions in their science journal.

Stage 3: Build a Learning Plan

1. The teacher will invite the students to share what they learned from viewing the PowerPoint yesterday.
2. The teacher will give everyone a lifesaver and ask them to put it in their mouth. At the same time the teacher will take a small container and put ten sugar cubes in it, then shake it.
3. What do you think will happen and how long will it take to happen? What type of weathering is this? Now look at the lifesaver, is this an example of weathering? If so what kind?
4. Today we are going to perform an experiment to observe and record examples of weathering.
5. The teacher will divide the students in groups of four and five students and distribute the materials.
6. Groups will be predetermined based on observed behaviors in other experiments and student reading abilities.
7. Groups will be given graduated cylinders, and will be instructed that they are going to observe chalk, limestone, marble, granite, and sandstone.
8. Each student will make a prediction of what will happen when each is dropped in water and in vinegar.
9. Students will measure 35 milliliters of water in five of the graduated cylinders and 35 milliliters of vinegar in the remaining 5 cylinders.
10. The teacher will instruct the students to place the rocks in each container, and cover the top of the cylinder with a balloon.
11. The students will then shake the cylinder 10 times. Wait 10 minutes and observe using a hand lens.
12. The teacher will then direct the students to take out their journals and answer questions about this part of the experiment.
    - What did I predict?
    - What did I observe?
    - How did the rock change?
    - Why did the rock stay the same?
    - Was there a difference between the rocks in the vinegar and the rocks in the water?
    - What were the bubbles in the water?
    - Was there change in the rock?
13. Finally, students will be instructed to take off the balloons and use tweezers to take out the bits of rock from the cylinder.
14. Students will then observe the changes that took place to the rocks and record it in the after column on their worksheets.
15. Students will complete a graphic organizer as a group summing up their observations on chemical and physical weathering.
16. Each group will come up and share what they learned about weathering from this experiment.