

WEATHERING

Weathering Instructional Case: A series of student-centered science lessons

Unit Timeline

Lessons	Class Time	Lesson Objective(s)	Lesson Prep	Key Vocabulary
1 Introduction to Weathering	25 min	<ul style="list-style-type: none"> Students demonstrate their prior knowledge on weathering and erosion using the “Mountain Age” probe. Students will use reasoning based on prior knowledge or experience with rocks to determine the age of a mountain. 	<ul style="list-style-type: none"> Make one copy per student of “Mountain Age” Probe 	n/a
2 Mechanical weathering – Salt and Chalk Lab	30 min	<ul style="list-style-type: none"> Students will create a simple model of mechanical weathering to demonstrate the abrasion process on rock. Students will build group process skills and participate in constructive science discourse. Students will observe and then reflect on this lab, and be able to express their thinking in a Claim/Evidence/Reasoning format as an exit ticket. 	<ul style="list-style-type: none"> Set materials out on a tray for each work group the following: <ol style="list-style-type: none"> Fill each zipper lock bag with about ½ cup of salt Put in one piece of colored sidewalk chalk into the bag with salt Timer Make one copy per student of Salt & Chalk Mechanical Weathering worksheet Set up computer and projector for PowerPoint 	<ul style="list-style-type: none"> Abrade/abrasion Claim Evidence Reasoning Sediments Weathering

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3 Types of Weathering	135 min	<ul style="list-style-type: none"> Identify five types of mechanical weathering, and five types of chemical weathering Identify and recognize the important factors affecting rates of weathering Complete two graphic organizers to reflect new knowledge Create a “mind-map” to organize weathering concepts 	<ul style="list-style-type: none"> Print one mechanical weathering graphic organizer per student Print one chemical weathering graphic organizer per student Print one weathering mind map per student Print off cards using a color printer, then laminate. Prepare one set for every 2-3 students, if possible 	<ul style="list-style-type: none"> Abrasion Acid rain Carbon dioxide Chemical Weathering Dissolve Freezing Mechanical Weathering Organisms Oxygen Particles Pressure Thawing Weathering
4 Effervescent Antacid Weathering	45 min	<ul style="list-style-type: none"> To engage students by giving them the freedom to create different tests To collect data using scientific instruments To use evidence collected to explain how temperature and other factors affect the rate of dissolution. 	<ul style="list-style-type: none"> Make copies of the Effervescent Antacid Weathering Prepare trays/bins of following materials for each group <ol style="list-style-type: none"> 3 packets of Alka-Seltzer (total of 6 tablets) clear plastic cup thermometer timer waste bowl disposable coffee cups (for hot water) 	<ul style="list-style-type: none"> Dissolve Prediction Procedure Weathering

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5 Weathering Competition	90 min	<ul style="list-style-type: none"> Identify factors that affect rates of chemical and mechanical weathering Predict which factors will affect the rate of weathering in a real rock sample and explain how each selected factor will affect rock Create a class bar graph to display group data Analyze class graph Use the C-E-R format to explain their thinking behind their hypothesis and results 	<p><u>Technology (if possible)</u></p> <ul style="list-style-type: none"> Set up document camera PowerPoint slide to project worksheet instructions and graph of class results. <p><u>Day 1</u></p> <ul style="list-style-type: none"> Label plastic jars with period and group number Make trays of materials for each group that include the following for each group: 1 plastic, wide mouth, screw top jar, Electronic scale with 0.1g accuracy, Timer, and a Funnel Identify an easily accessible location set up a variable station with premeasured plastic portion cups of each of the solid variables (sand, gravel, salt), and 8 oz cups of each of the liquid variables (tap water, seltzer water, vinegar). Create and label trays by period for students to set their bottles on after experimenting. <p><u>Day 2</u></p> <ul style="list-style-type: none"> Prepare trays of materials for each group including: Jars (with rocks and variables), funnel, plastic bowl, plastic spoon, scale, calculator, and paper towels Designate a central location for the large waste container for students to pour their liquid/solid mixtures (so they do not go in the sink) 	n/a