

Grade: 3 Subject: Science	Unit of Study: Earth Materials
Big Idea/Rationale	<p>Students investigate the physical properties of rocks and minerals. They observe and sketch rocks and minerals and begin to understand how rocks and minerals are different. Tests are conducted to determine the physical properties of minerals including hardness, luster, color, and reaction to acid. Using the acid test to determine if calcite is present, students examine rocks that may contain the mineral calcite. Lastly, students observe a rock and attempt to determine the component minerals. Students transfer knowledge and skills learned in the final assessment in deciding upon a good rock or mineral choice for an outside statue.</p>
Enduring Understanding (Mastery Objective)	<ul style="list-style-type: none"> • Develop an interest and wonder about earth materials. • Gain experiences with rocks and minerals. • Understand the process of taking apart and putting together to find out about materials. • Use measuring tools to gather data about rocks. • Collect and organize data about rocks. • Observe, describe, and record properties of minerals. • Seriate minerals on the basis of one property. • Investigate the effect of vinegar on a particular mineral, calcite. • Use evaporation to investigate rock composition. • Learn that rocks are mixtures of minerals and that minerals cannot be physically separated into other materials. • Compare their activities to the work of a field geologist. • Acquire the vocabulary used in earth science. • Exercise language and math skills in the context of earth science. • Gain experiences that will contribute to their understanding of several pervasive themes that relate one scientific idea to another
Essential Questions (Instructional Objective)	<ul style="list-style-type: none"> • How are properties used to identify, sort, and classify rocks and minerals? • What kind of simple tools are used to help determine the properties and how are the tools used? • How does acid rain affect rocks that contain calcite? What kinds of rocks would be a good choice for building material? Why?
Content (Subject Matter)	<p><u>Investigation 1: Mock Rocks</u></p> <ul style="list-style-type: none"> • Part 1: <ul style="list-style-type: none"> ○ Students will be able to make and record observations of mock rocks and compare the properties of mock rocks with those of real rocks. • Part 2: Taking Rocks Apart: <ul style="list-style-type: none"> ○ Students will find ways to determine and separate the ingredients of rocks. They will observe separation and settling when water is added.

	<ul style="list-style-type: none"> • Part 3: Observing Crystals <ul style="list-style-type: none"> ○ Students will observe crystal formation and determine that the crystals are salt and alum. They will learn that a rock is made of many ingredients and a mineral cannot be physically broken down any further. <p><u>Investigation 2: Scratch Test</u></p> <ul style="list-style-type: none"> • Part 1: Observing Minerals <ul style="list-style-type: none"> ○ Determine what properties are needed to identify minerals. • Part 2: Testing for Hardness <ul style="list-style-type: none"> ○ Students will use fingernails, pennies, and paper clips to determine the hardness of minerals. <p><u>Investigation 3: Calcite Quest</u></p> <ul style="list-style-type: none"> • Part 1: Detecting Calcite: <ul style="list-style-type: none"> ○ Students will observe that the mineral calcite bubbles and fizzes when placed in vinegar. They will look for evidence of calcite in the rocks by putting them in vinegar. • Part 2: Looking for More Evidence: <ul style="list-style-type: none"> ○ Students will conclude that calcite is in limestone and marble, after the evaporation of the vinegar solution and the formation of needlelike crystals of calcite in the evaporation dishes. <p><u>Investigation 4: Take it for Granite</u></p> <ul style="list-style-type: none"> • Part 1: Identifying Minerals in Granite: <ul style="list-style-type: none"> ○ Students will be able distinguish between rocks and minerals in a given set. They will be able to identify which of the minerals are ingredients in pink granite.
<p>Skills/ Benchmarks (CCSS Standards)</p>	<ul style="list-style-type: none"> • 5.1.P.A.1 Display curiosity about science objects, materials, activities, and longer-term investigations in progress. • 5.1.4.B.1 Design and follow simple plans using systematic observations to explore questions and predictions. • 5.1.P.B.1 Observe, question, predict, and investigate materials, objects, and phenomena (e.g., using simple tools to crack a nut and look inside) during indoor and outdoor classroom activities and during any longer-term investigations. • 5.1.4.B.2 Measure, gather, evaluate, and share evidence using tools and technologies. • 5.1.P.B.2 Use basic science terms and topic-related science vocabulary. • 5.1.P.B.3 Identify and use basic tools and technology to extend exploration in conjunction with science investigations. • 5.1.4.B.4 Communicate and justify explanations with reasonable and logical arguments. • 5.1.P.C.1 Communicate with other children and adults to share

	<p>observations, pursue questions, and make predictions and/or conclusions.</p> <ul style="list-style-type: none"> • 5.1.4.C.1 Monitor and reflect on one’s own knowledge regarding how ideas change over time. • 5.1.P.D.1 Represent observations and work through drawing, recording data, and writing. • 5.1.4.D.2 Work collaboratively to pose, refine, and evaluate questions, investigations, models, and theories. • 5.1.4.D.3 Demonstrate how to safely use tools, instruments, and supplies. • 5.4.2.C.1 Describe Earth materials using appropriate terms, such as hard, soft, dry, wet, heavy, and light. • 5.4.4.C.2 Categorize unknown samples as either rocks or minerals. • 5.4.2.G.4 Identify the natural resources used in the process of making various manufactured products.
Materials and Resources	<ul style="list-style-type: none"> • Teacher Guides • Web Resources
Notes	