

Smith Farm Elementary Lesson Plan

Teacher Name: Edwards	Grade Level: 4th Grade	Subject: Science
Date: March 13-17	Standards: 4.P.2.2 Explain how minerals are identified using tests for physical properties of hardness, color, luster, cleavage, and streak. 4.P.2.3 Classify rocks as metamorphic, sedimentary or igneous based on their composition, how they are formed, and the processes that create them.	

	Monday, March 13	
Standards-aligned Materials and Resources:	<ul style="list-style-type: none"> Minerals A-L from STC Kit Streak plates (black and white) Mystery Minerals Investigation sheet 	
Clear Learning Goals (I Can statements):	I can use streak plates to find a mineral's identifying color, and discuss the differences between each mineral's observable and identifying colors.	
Vocabulary	streak, observe, identify, observable color, identifying color	
Build Background	Turn and talk: What does it mean to observe something? Using what you know about the word "observe," what do you think the term "observable color" could mean?	
Direct Instruction (Teacher led)	<p>Remind students that last week we began observing 12 different minerals. In this lesson today, we are focusing on one property, which is the color of the minerals. We will first look at the minerals' observable color (the color it appears when we look at it) and then we will use streak plates to find their identifying color (the color of the powdered form of the mineral).</p> <p>Explain to students that simply looking at the observable color of a mineral is not reliable because many minerals can have the same color. However, the identifying color (color left on the streak plate), can be different than that of the mineral's observable color, which can help geologists identify them.</p> <p>Once again, use minerals A and B to model for students how to use the streak plates. Run the mineral gently over the top of the plates so that it leaves a streak of color behind. If you press too hard, you may scratch the surface of the plate, which can mess up the results. For each mineral, do the streak test on both the black and white plates in order to get the correct results. Once you have shown students how to use the streak plates for minerals A and B, record both of the identifying colors for these minerals on the Mystery Minerals Investigation sheet.</p>	Time: 5 min.

Student Practice	There are 10 more minerals students will get a chance to observe today (C-L). Give each table group a cup with the minerals and a black and white streak plate. They should test each mineral and record the streak color for both the black and white plates on their Mystery Minerals Investigation sheet. *Note: These streak plates can be washed and used again, so keep that in mind in case they start to get dirty.	Time: 15 min.
Check for Understanding	Have students answer the following question: Why is knowing a mineral's identifying color important in order to determine which mineral it is?	Time: 5 min.

	Tuesday, March 14	
Standards-aligned Materials and Resources	<ul style="list-style-type: none"> Minerals A-L from STC Kit Penlights Mystery Minerals Investigation sheet Science notebook 	
Clear Learning Goals (I Can statements):	I can use a penlight to identify the luster of minerals, as well as if they are opaque, translucent, or transparent.	
Vocabulary	light, luster, opaque, translucent, transparent, metallic, nonmetallic	
Build Background	Shine a light on something in the room that is shiny. Have students share their observations on that object. Then, shine a light on something in the room that is dull and have them share what they notice. This will begin our discussion of metallic and nonmetallic objects.	
Direct Instruction (Teacher led)	<p>Remind students that yesterday we observed the color of minerals. Today, our focus is going to be on the ability to transmit light and the luster of our 12 minerals. Before beginning today, there are several vocabulary words that students will need to understand in order to complete their light/luster observations. Have students write these definitions in their science notebooks. The vocabulary students need for the light observation include:</p> <ul style="list-style-type: none"> Opaque: the mineral transmits no light (no light passes through them) Translucent: the mineral transmits some degree of light (a little light passes through) Transparent: the mineral transmits almost all of the light that is shined at it <p>The vocabulary students need for the luster observation include:</p> <ul style="list-style-type: none"> Metallic luster: minerals that reflect light like polished metal 	Time: 5 min.

	<ul style="list-style-type: none"> ● Nonmetallic luster: all other minerals (do not look like polished metal; may be dull, waxy, pearly, or brilliant) <p>After describing the meanings of these words to students, use minerals A and B to model for students how you would find the light and luster information using the penlights. Using the penlight, shine it at the minerals (separately) and determine if any light passes through them. Record your observation (opaque, translucent, transparent) in the light column on the Mystery Minerals Investigation sheet. Then, complete the luster test by shining the penlight on the minerals and determining if they have metallic or nonmetallic luster. Record this information on the Mystery Minerals Investigation sheet.</p>	
Student Practice	There are 10 more minerals students will get a chance to observe today (C-L). Give each group a cup with the minerals and a penlight for them to use while analyzing. They are only completing the light and luster tests today. Students must use the proper vocabulary when recording their light and luster observations on the Mystery Minerals Investigation sheet.	Time: 15 min.
Check for Understanding	Have students answer the following question in their science notebooks: How can completing the light and luster tests help geologists identify minerals? Explain your answer.	Time: 5 min.

	Wednesday, March 15	
Standards-aligned Materials and Resources	Early Release Day - No Science Instruction	
Clear Learning Goals (I Can statements):		
Vocabulary		
Build Background		
Direct Instruction (Teacher led)		Time: 5 min.
Student Practice		Time: 15 min.

Check for Understanding		Time: 5 min.
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	Thursday, March 16	
Standards-aligned Materials and Resources	<ul style="list-style-type: none"> Minerals A-L from STC Kit Nails Copper penny Magnets Mystery Minerals Investigation sheet 	
Clear Learning Goals (I Can statements):	I can determine the hardness of different minerals as well as conduct tests to see which minerals are magnetic.	
Vocabulary	hardness, magnetic, Mohs scale	
Build Background	Turn and talk: What is a magnet and what kinds of objects are attracted to magnets? How do you think magnets could be useful when identifying minerals?	
Direct Instruction (Teacher led)	<p>Today, we will complete our last two tests to identify minerals, which are hardness and magnetic tests. Explain to students that hardness is a mineral's resistance to scratching, and scientists classify the hardness of minerals using the Mohs scale. The Mohs scale is based on the concept that the harder of two minerals will scratch the softer. We will be classifying minerals as soft, medium, or hard today. We will also be testing to see if any of the minerals we have been observing are attracted to magnets.</p> <p>To begin, explain to students the scale we will be using to determine if minerals are soft, medium, or hard.</p> <ul style="list-style-type: none"> Soft: Can be scratched by a penny Medium: Cannot be scratched by a penny but can be scratched by a nail Hard: Cannot be scratched by a penny or a nail <p>*Note: It will be up to teachers how they want to go about the hardness test today. I know some might not be comfortable letting their students use actual nails for the hardness test, so that might be something that we do as a whole group and let students test magnets in smaller groups.</p> <p>Model for students using minerals A and B how to use nails/pennies to complete the hardness test and magnet test. Record the information you find on the Mystery Minerals Investigation sheet. Under the magnetism column, students will either say "magnetic" or "not magnetic." Under the hardness column, students will either say the mineral is soft, medium, or hard.</p>	Time: 5 min.

Student Practice	<p>There are 10 more minerals students will get a chance to observe today (C-L). Give each group a cup with the minerals and make sure they have nails (maybe) and magnets to use. They are only completing the hardness and magnetic tests today.</p> <p>After completing all of the tests, give students the names of each mineral (A-L), as well as their uses in everyday objects. → Names of the minerals are under the plans.</p> <p>If there is extra time, students can log on to Discovery Ed and explore the Minerals and Rocks science simulation. (Link to Simulation)</p>	Time: 15 min.
Check for Understanding	<p>Have students answer the following question in their science notebooks: How can knowing the hardness of a mineral help geologists identify them?</p>	Time: 5 min.

	Friday, March 17	
Standards-aligned Materials and Resources	<ul style="list-style-type: none"> • “All About Igneous Rock” reading and questions • Igneous Rock info sheet (for science notebooks) 	
Clear Learning Goals (I Can statements):	<p>I can explain how igneous rocks are formed and give examples of what these rocks are used for.</p>	
Vocabulary	<p>exterior, characteristics, igneous rock, extrusive, intrusive</p>	
Build Background	<p>KWL Chart: Write down everything you know about rocks already, including what they can be used for. Once you have written down everything you know about rocks, write down what you want to learn about rocks.</p>	
Direct Instruction (Teacher led)	<p>Tell students that today, we are going to move on from minerals and begin learning about the different kinds of rocks. Explain that rocks are hard materials made up of one or more minerals, and they are usually classified by how they were made or formed. The three types of rocks we will be learning about are igneous, sedimentary, and metamorphic. Today, our focus is going to be igneous rocks, including how they are formed, the different kinds of igneous rocks, and how these rocks can be used.</p> <p>We will be reading a text called “All About Igneous Rocks.” Explain that while we are reading today, we will annotate the text and look for key terms and important information. Begin by reading the first two paragraphs of “All About Igneous Rocks” with students and make sure they understand how extrusive igneous rocks are formed.</p>	Time: 5 min.

Student Practice	<p>Students will finish reading the “All About Igneous Rock” passage with a partner or their table groups. As they are reading, they should focus on the difference between extrusive and intrusive igneous rocks, characteristics of igneous rocks, and examples of igneous rocks. They should also make sure they are annotating the passage as they are reading.</p> <p>Discuss the remainder of the passage with students after they have finished reading. Then, give them the Igneous Rock info page that can be glued into their science notebooks. This page details what extrusive and intrusive igneous rocks are, as well as lists uses and examples of different igneous rocks. This page will be useful for students to refer back to when we are classifying them next week.</p>	Time: 15 min.
Check for Understanding	<p>Students will use the “All About Igneous Rock” passage and the information sheet in their science notebooks to answer questions about igneous rocks.</p>	Time: 5 min.

Direct Instruction (Teacher led): *Examples - Modeling, providing new vocabulary, questioning, anchor charts, scaffolding, chunking content, etc.*

Student Practice: *Examples - Small group w/ teacher, pairs, individual; graphic organizers, writing prompts, think-pair-share, student-led discussions, student summaries, pictorial notes, mini-projects, etc.*

Check for Understanding: *Examples - ticket out the door, kahoot, white boards, four corners, turn and talk, thumbs up/down, parking lot/Windshield, summative assessment, project, performance, Pear Deck slides, Flipgrid, Padlet, etc.*

Minerals

- A. Feldspar
- B. Quartz
- C. Pyrite (Fool’s Gold)
- D. Calcite
- E. Fluorite
- F. Graphite
- G. Hematite
- H. Gypsum
- I. Magnetite
- J. Muscovite
- K. Sulfur
- L. Talc