Smith Farm Elementary Lesson Plan

Teacher Name: Edwards	**Grade Level:** 4th Grade	**Subject:** Science
Date: March 6-10	**Standards:** **4.P.2.1** Compare the physical properties of samples of matter: (strength, hardness, flexibility, ability to conduct heat, ability to conduct electricity, ability to be attracted by magnets, and the reactions to water and fire). **4.P.2.2** Explain how minerals are identified using tests for physical properties of hardness, color, luster, cleavage, and streak.	

	Monday, March 6-10	
Standards-aligned Materials and Resources:	• "Matter and Energy: What is Matter?" article and questions (Newsela)	
Clear Learning Goals (I Can statements):	I can explain what matter is, as well as give details on the states of matter and its physical/chemical properties.	
Vocabulary	matter, mass, solid, liquid, gas, physical properties, chemical properties	
Build Background	**Turn and talk:** What words could you use to describe a block of wood? A glass of milk? Oxygen? What do these items have in common and how are they different?	
Direct Instruction (Teacher led)	Explain to students that today we will be beginning our science unit on matter, with our focus over the next few days being on the physical properties of matter. As an introduction to this unit, before beginning our hands-on investigations, we will be reading the article titled "Matter and Energy: What is Matter?" Read the first paragraph of this article with students. Make sure students understand that matter is anything that takes up space (air, water, rocks, people, etc.) and mass is the amount of material that makes up an object.	**Time: 5 min.**
Student Practice	Have students partner read the remainder of the article. As they are reading, they should annotate their text and focus on the different states of matter, as well as examples of physical and chemical properties of matter. Once students have had a chance to read, make sure they understand the difference between solids, liquids, and gases, and talk about examples of each. Also point out the differences between boiling point, freezing point, and melting point.	**Time: 15 min.**

	Add today's vocabulary to an anchor chart that the students will be able to look back at. Extra video, if time allows: Part(icles) of Your World: Crash Course Kids #3.2	
Check for Understanding	Students will answer the passage questions on their own. Use this assignment to make sure students understand what matter is, as well as what the physical properties of matter are.	**Time: 5 min.**

	Tuesday, March 7	
Standards-aligned Materials and Resources	• 12 different minerals (A-L from STC kit) • Mystery Minerals Investigation sheet	
Clear Learning Goals (I Can statements):	I can explain what a mineral is, as well as the physical properties used to identify minerals. I can observe twelve different minerals and use details to describe their appearance.	
Vocabulary	physical, properties, mineral, chemical	
Build Background	Hold up three different minerals (feldspar, quartz, and pyrite → A-C) and call on students to share what they notice about each of these three minerals. They can talk about the size, shape, color, etc. Make sure not to give students hints at first. See what they notice on their own.	
Direct Instruction (Teacher led)	Explain to students that next week, we will be exploring minerals and the physical properties that are used to identify them. Give students the definition of **mineral** (naturally occurring, solid substances with distinct physical and chemical properties; different samples of the same mineral can sometimes look very different physically, but the chemical composition is always the same). Explain that over 3,500 minerals have been found in the earth's crust, but geologists are able to identify minerals because they all have distinctive physical and chemical properties. The physical properties we will be talking about and observing next week include texture, streak color, luster, light, magnetism, hardness, and shape. The purpose of today's lesson is to give students some practice with describing a mineral's appearance using details. To begin, give each student a Mystery Minerals Investigation sheet. On the back of this sheet, there are 12 boxes labeled A-L. For each mineral, students will draw what they see as well as write down a few words that describe that mineral.	**Time: 5 min.**

Student Practice	On the back of the Mystery Minerals Investigation sheet, there are 12 boxes labeled A-L. For each mineral, students will draw what they see, as well as write down a few words that describe that mineral. Model the first few minerals so that students have a better idea of how they can complete their observations. ***This will be continued tomorrow, so students don't need to rush. Whatever they don't finish today can be finished tomorrow.**	**Time: 15 min.**
Check for Understanding	**Quick Write:** Have students respond to the following question: When describing the physical properties of minerals, why is it important to use specific details? Back up your answer with observations you made today and other examples. Have a few students share their response to the above question. Listen to answers and make sure students understand the importance of giving details when describing minerals.	**Time: 5 min.**

	Wednesday, March 8	
Standards-aligned Materials and Resources	• 12 different minerals (A-L from STC kit) • Mystery Minerals Investigation sheet	
Clear Learning Goals (I Can statements):	I can explain what a mineral is, as well as the physical properties used to identify minerals. I can observe twelve different minerals and use details to describe their appearance.	
Vocabulary	physical, properties, mineral, chemical	
Build Background	**Class Discussion:** Review the different physical properties that students can describe when observing matter (color, shape, feel, smell, weight, length, etc.)	
Direct Instruction (Teacher led)	**Students will pick up where they left off yesterday with drawing and observing minerals A-L. On the back of the Mystery Minerals Investigation sheet, students will finish drawing each mineral, and will write a few words describing that mineral.**	**Time: 5 min.**
Student Practice		**Time: 15 min.**
Check for Understanding		**Time: 5 min.**

	Thursday, March 9	
Standards-aligned Materials and Resources	• 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)	Remind students that yesterday 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). 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. 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.	**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.**

	Friday, March 10	
Standards-aligned Materials and Resources	• 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)	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: • **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 The vocabulary students need for the luster observation include: • **Metallic luster:** minerals that reflect light like polished metal • **Nonmetallic luster:** all other minerals (do not look like polished metal; may be dull, waxy, pearly, or brilliant) 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.	**Time: 5 min.**

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.**

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.***