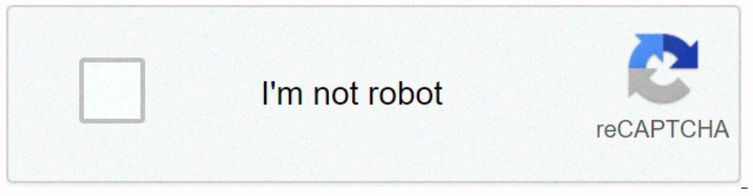

Continue

Properties of rocks lesson

Blank layer. Empty Layer.Empty Layer Layer.Empty Layer.Empty Layer.Empty Layer.Empty Layer.Empty Layer.Empty Layer.Empty Layer.Empty Layer.Empty Layer.Empty Layer.Empty Layer.Empty Layer.Empty Layer.Empty Layer.Empty Layer.Empty Layer.Empty Layer This is the second lesson in our unit about stones. In this lesson, students record the physical characteristics of the stones as the teacher leads a group through a virtual rock collection activity using iPads. This lesson is in 1.E.2.1. This lesson is followed by a more formal instruction on testing the physical properties of rocks after students have had the opportunity to write them down on their own! I post an essential question for each lesson. Today's question is, how can I describe what a rock looks like? Listen to my explanation of basic standards and fundamental issues. Materials: * Lots of rocks - some tagged, some are not tagged (enough 1/3 of the class) * Books rocks many different reading levels with many images * 1-2 copies of the Rock Type Template for each student * Magnifying glasses * iPads or computer (this can be done across the group of a computer) For students to be successful in this lesson when not working with me, I need to make sure they understand the Rock Type template before they get to that center. So, I'll show you the Smart Board and really explain the instructions of the day. This is to introduce any unknown vocabulary they may encounter on the form and to help students understand my expectations of their work. At the beginning of the year, we spent a lot of time using accurate colors in science, labeling and charting, etc. This is a great time to go back and recreate those expectations! Keeping students task ** This section takes at least 2 days to complete!** Students all have their own iPads, so this activity has split them into 3 groups so that I can facilitate the iPad activity. On the iPad (or a desktop computer), students will use this website to create their own rock collection and learn more about the properties of rocks. The game and explanations are a bit difficult for first graders, so going through this activity made me explain and read the group as we go along. Since this is very much a practical digital exploration, my students will not take note during this center. While I'm working on the iPad group, group 2 reads the the books were rocks and watched rocks with magnifying glass. I made sure that books at many different reading levels identify many images. If you want to take notes, they add you to the next page in their scientific journals. Group 3 is a collection of rocks from the Rock Center and describes information about them in scientific journals using this Rock Type Template. Although students do not conduct a full study, this activity supports scientific and engineering practice 3 - Conduct observations (firsthand or media) and/or collect measurements of data that can be used to make comparisons. Each group works in the center for about 15-20 minutes, depending on how long it takes the iPad group to get through the activity. During the lesson, students look at many different rocks and have different experiences in the three centers. To close it, I'm offering you a simple question. I said, What have you learned? This gives students time to truly talk about their experiences and share new knowledge. I also listen to all the misconceptions as well as areas that are worth learning more about as they speak. This discussion supports science and engineering practice 8, obtaining, evaluating, and communicating information as students talk about their experiences. Lesson Plan #: AELP-GLG004 Submitted by Kathryn Ann Fisher Email: k.fisher@m.cc.utah.edu School/University/Affiliation: Center for Integrated Science Education - Salt Lake City, UT 84112-9202 Date: January 28, 2000 Level(s): 2 Subject(s): Duration: 50-60 minutes Description: Students divided into groups and given a study trip. During this tour, students can learn about the characteristics of rocks and minerals, how to identify and classify rocks and minerals, and finally the chemical propoerties of these rocks and minerals with acid tests. Goals: Students demonstrate an understanding of the characteristics and properties of rocks and minerals. Objective(s): Students: adhere to different classification characteristics and use of rocks and minerals to identify a variety of rocks and minerals: aluminum foil vitamins soda coins film cabling cement food batteries paints items not made of minerals toothpaste nails China glass animal feed salt mortar mirrors magnets Poster of the National Energy Foundation; The mountains of metals rocks and minerals and how we use them Deseret News article minerals in your life materials Station 2: rock and mineral box University Geology Department vulcan (granite, obsidian, basalt and pumice stone) metamorphic (slate, marble and staurolite) sediment (slate, brachiopoda limestone and sandstone) minerals 10 hand lens 1 field guidebook Materials station 3: paper towel bag mineral and rock samples 5 Petri dishes 5 -10% HCl 1 cup baking soda 1 cup vinegar procedure: NB: 3 volunteers per class Background: Accessory attachment for details. Concept: Rocks are aggregates of one or more minerals and are classified according to their origin (the mineral is a homogeneous chemical substance or complex and classified according to physical characteristics). Introduction: 5 min Volunteers must review background information before the activity. Introduce volunteers to the class. Two volunteers will set up the three stations, while the third volunteer will speak to the class. Ask students what you know about rocks and minerals. Where did they come from? Accept all the answers. Ask students why we should learn about rocks and minerals. Divide the class into three groups and assign a volunteer to each group. The groups are turning over the three stations. Station 1: Learn about rocks (10 minutes) Show items from the group in the product box. Some items list ingredients, read through these with students, and let them discuss where the ingredient comes from and what its function is in the product. Do students identify items not made of minerals? Ask the class if they can make other mineral use. See the Deseret News Memo and the Rocks and Mineral Poster. As a group, let students track the route from mining to the production of products. Invite students to think about the Kennecott copper mine and how it might resemble our poster. Encourage them to discuss the importance of rocks and minerals in maintaining and improving our way of life; can students list ways rocks are used in agriculture, arts, communication, construction, consumer goods, energy, manufacturing, medicine, transportation and science and technology? Direct and encourage their responses. If you look around the room, can you identify objects made of rock or minerals, or can you distinguish between things made of rock or minerals? We continue to look through the poster for rocks and minerals as students discuss several ways in which we use this resource. Station 2: How Rocks qualified: (15 minutes) At this station students look at samples of rock and mineral boxes. One box at a time. Vkinus rocks Granite, obsidian, pumice and basalt are examples of volcanic rocks. Let each student handle the rock samples and look at them with the hand lenses. Students describe the color, texture, shape, weight, etc. Ask students why some rocks are smoother than others. (Round and smooth rocks were moved and formed from water and ice). See if students can pick out the obsidian, a bright, black and very smooth glass like a rock. Then let them discover the characteristics of pumice stone compared to other rocks (pumice stone is a rock that floats in the water). As you look at the rocks, ask bout for weight, elasticity, texture, size, shape and other properties that we can use to classify rocks. Encourage to compare the stones. Background information as a reference, discuss with students how to are formed. Metamorphic rocks Slate, marble and quartzite are examples of metamorphic rocks. Let students discover all metamorphic rocks and try to identify them through field guidebooks and handheld lenses. Invite them to write down what they see. Are some rocks very similar to others? Do you see any signs of strong weather on the rock? What could have given the shape of the rock samples? Discuss background information with students and compare and compare metamorphism with the volcano. Be careful not to mix the rocks from

one box to another. Sediment rocks Sandstone, slate and limestone are examples of sediment rocks. The most well-known type of sediment rock found in Utah is sandstone. Ask students where the sand came from in this process. Briefly review how sediment rocks form. Let students explore all the rocks and try to identify them through field guidebooks and handheld lenses. Students should look at all the layer lines of sediment rock samples. Ask them to imagine pressing and cementing to make this rock. Station 3: Experiments: Acid and magnet tests (15 minutes) Explain to students that some substances react to certain chemicals, and investigators often use chemicals to uncover traces. We will use a chemical test to determine which minerals in the mineral bag contain calcium carbonate, the substance found in toothpaste, vinyl, chalk, glass and chewing gum coating. Give a petri dish to each student in the group. Place a paper towel on a flat surface and place the petri dish on top. Place 1/4 teaspoon baking soda in the petri dish. Add a few drops of vinegar (acid) to the baking soda. Notice what's happening. Baking soda is made from carbonate and fizz when it comes into contact with acid like vinegar. Let each student take 5 samples of the mineral bag and try to figure out which reacts with the acid. Place the samples on the paper towel and add a few drops of M10%HCl acid M. Notice what's happening. (Be very careful not to get the acid on you). Students should plan their own experiments. Objects containing iron are attracted to magnets. Look at the flasks of iron filings and magnets inside and then let the students describe how they could test the iron for mineral samples. Then let them try it. Conclusion: Rocks can be divided into three main groups depending on how they form. Sediment rocks are made of sand and sludge, which are pressed into layers. The stone became so hot that they melted, then cooled and solidified again. Metamorphic rocks are sedimentated or volcanic rocks that have been altered by the influence of heat or pressure. There are many ways that rocks can be changed. The Earth vkanus below or below are constantly physical and chemical conditions that alter them. As a result of these changes, sedimentary rocks, metamorphic rocks or new volcanic rocks are formed. Students should be able to describe and characterize different types of common rocks, use the guidebook to identify rocks and minerals, and be aware of the many uses of rocks and minerals in today's world. Cleaning: Return all samples to the museum box. Make sure the tables are wiped clean and all hand lenses and acid vials are returned to volunteers. Rating: Notice students attending different activities at each station. Make sure that each student gets a chance to correctly identify one for each category of rocks and minerals. Useful Internet Resources: Petrology Basics geol202/petrology/rock.html Rock Doctor 2000 bug2/rock1.htm Identifying Rocks indentify_rocks/identify_rocks1.htm Background Information: Rocks are solid lumps of minerals made up of the Earth's crust. A mineral is a substance that has a definite chemical composition and characteristic physical properties such as hardness, crystal structure and glitter. Some examples of minerals are quartz, pyrite, gold and copper. There are three different ways to create rocks, so geologists usually classify the rock according to how it was made. The three main types of rocks- volcanic, sedimentous and metamorphic, are all found in Utah! The earth-derived stone masonry from magm or liquid rock is derived. Tremendous heat in the Earth's crust produces the liquid magma. When magma cools and hardens beneath or on the earth's surface, it produces volcanic rocks. The rate at which the rock cools from liquid to solid affects its shape and texture, features that help to classify the rock as unreasonable. In the Salt Lake Valley we find granite in the Great and Small Cottonwood Canyons. Granite is a volcanic rock that cools below the earth's surface. It's a hard rock with patches of quartz crystals. Other volcanic rocks are cool above the surface of the earth, and are called volcanic rocks. Two examples of this, obsidian and pumice stone look very different from each other. The fastest cooling of lava results in obsidian. Metamorphic metamorphism means a change in form or composition. Metamorphic rocks form deep in the ground when previously existing rocks change due to intense pressure, chemical reactions and heat. Often these rocks are former sedimentary rocks that have been recrystallized (repetition of the rock forming process). E.g. slate recrystallized slate, marble recrystallized limestone and quartzite recrystallized sandstone. Sediment sediment or small fragments, or the remains of plants and animals. Over millions of years, these sediment have settled at the bottom of oceans or lakes. When layers of sand and mud are pressed together over time, it produces sedimentous rocks. The most well-known type of sediment rock found in Utah is sandstone. Layers of sedimented rock are obvious. Slate is the most common sediment rock. It is made of mud and clay inserts, very soft and weather quickly. Minerals Minerals are either free, non-combined native elements or elemental compounds. Our definition of this activity is simply that they are rocks-embracing materials. The mineral is a naturally occurring inorganic solid (except water, mercury and opal) with a specific chemical composition (atomic structure) and crystalline structure. The composition of each mineral varies within specified limits. Borders.