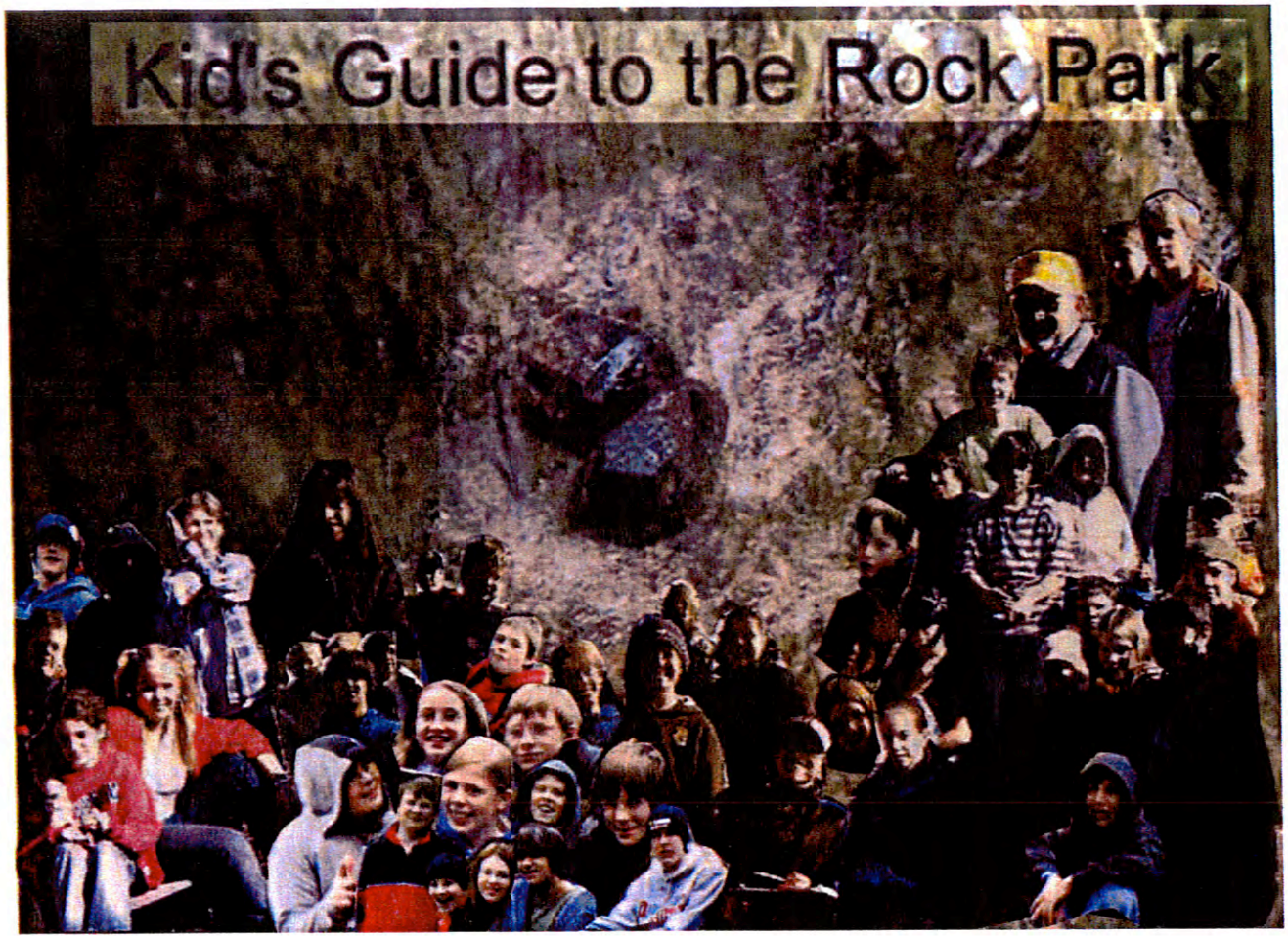


Introduction to our rock park project

By Corey

While we worked on this project for two months, we visited the rock park five main times and did five main steps to complete the project. Here is what we did each time:

Fieldwork/lab 1: On day #1, we explored our rocks and the rock park. We were introduced to Paul Fontaine who helped us with our project. Back in the classroom we were introduced to systematic testing of minerals. We got into groups and each learned about one kind of systematic testing. On the next day we mixed our groups so that we could all teach each other about each kind of mineral test.

Fieldwork/lab 2: On day #2, we went to the rock park and did mineral testing on our rocks to find proof of different types of minerals. In our conclusions, we used our testing results to find the different types of minerals in our rocks.

Fieldwork/lab 3: On day #3, we found out what rock type our rock was using the information we got from the tests and using our knowledge we learned in class. We used notes from our class to identify whether our rock was Sedimentary and Igneous or metamorphic.

Fieldwork/lab 4: On day #4 we used our data to make inferences about what must have happened in the Connecticut River Valley for our rocks to have formed. For example, if someone's rock was igneous, then there must have been a lava flow of some kind. Back in the classroom we took our test on identifying rock types. For the test we had 8 different rocks that we had to use our knowledge and new understanding of rock types to identify.

Fieldwork/lab 5: When we had learned about the mineral and rock type of our rocks, we went on to create this guide. We created our first drafts and handed them in to Professor Richard Little to get an expert check. On the Fieldwork part we met the great Mr. Little himself and he handed us back our first drafts. With Mr. Little we corrected and discussed our first drafts and then made the final drafts of the cards that you see in this book.

How To Identify a Mineral

By Crispin

The experiments we did to identify minerals were the streak test, hardness scale, acid test, breakage pattern, luster, and color.

STREAK

The streak of a rock is the color of the powdered mineral. The streak may be a different color than the rock. To do this test you rub a rock on a white or black plate and look at the color it makes.

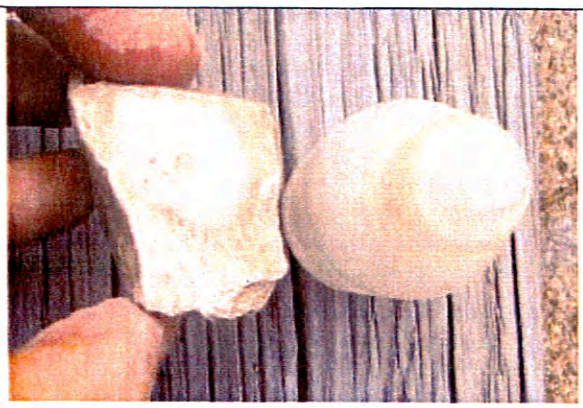
HARDNESS

The hardness is the measures of a mineral's resistance to abrasion. To do this test you try to scratch a rock with another one. The one that gets scratched is the softer rock. You use index minerals which are numbered from hardest to softest to tell how hard the mineral is..

Hardness	Mineral
1	Talc
2	Gypsum
2.2	*Fingernail*
3	Calcite
4	Fluorite
5	Apatite
5.5	*Glass, steel knife*
6	Feldspar
7	Quartz
8	Topaz
9	Corundum
10	Diamond

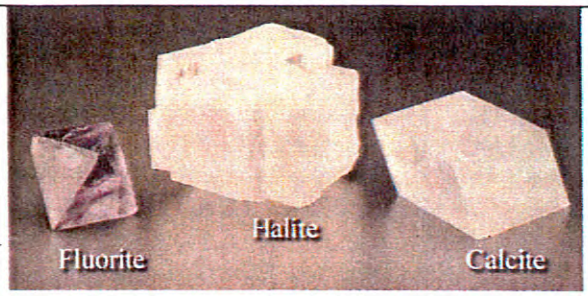
ACID TEST

The acid test is a way of finding out if a mineral has calcite in it. The way this is done is you have Hydrochloric acid and you put a drop on the rock and if it fizzes it has calcite in it.



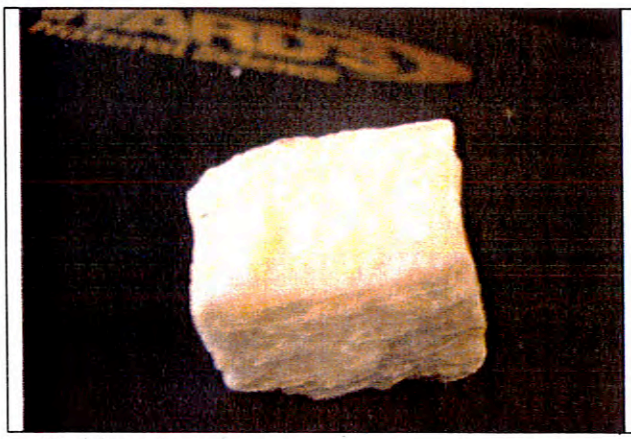
BREAKAGE PATTERN

The breakage pattern test is a way of specifying certain minerals, for an example Mica and Talc flake when rubbed, and they can be scratched by a fingernail. And some minerals have cleavage which means they break along specific lines, or fracture which is the look of a mineral after it has been broken. An example of cleavage is shown in the top right.



LUSTER

Luster is a description of the way light interacts with the surface of a mineral. This is how you would tell someone how a mineral looks. It has nothing to do with color or shape, but is related to transparency and surface conditions. The terms used are not scientific, but are meant to be descriptive. Such as glassy and soapy and metallic such as pyrite which is shown on the right.



(Feldspar)

What Are Minerals?

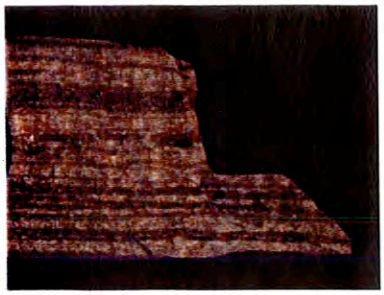
(A bunch of mineral samples)

A mineral is a solid non-living thing made by nature. A mineral is made of compounds. Each compound is made of a specific combination of elements.

What is the difference between rocks and minerals?

Minerals make up rocks. Rocks are made of groups of minerals or other rocks. A mineral is made up of one thing, and rocks are made of combinations of different minerals smashed together.

There are 3 general rock types: Sedimentary, Igneous and Metamorphic. The next set of pages explain the difference.



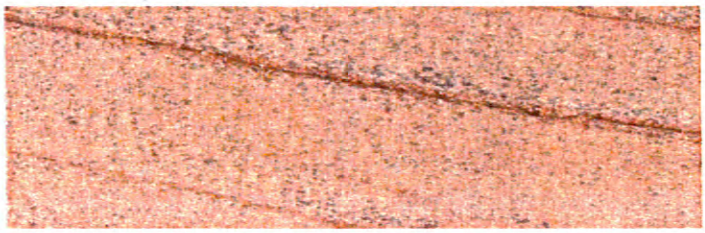
Sedimentary Rocks

All sedimentary rocks are made by erosion and deposition of sediments caused by wind,water, or ice. Then as they are buried under more and more layers they are compressed and cemented together by pressure and time. To identify sedimentary rock, look for grains of sediment and layers.

Clastic

Sedimentary rocks are formed from grains of sand, mud, clay or gravel that have been cemented together.

Example:
Sandstone or Mudstone



Organic

They also can be made from dead plant life like in a rain forest after water has covered it before it rots. Then the water must be squeezed out of it later. The other two ways a sedimentary rock can be formed are dead organism like shellfish or coral. The hard part of the dead fish which are made of calcium carbonate then they get cemented together.
Examples are: Coal and Limestone

Evaporites/Chemical

The other form from sea bed or salt lakes and then get cemented together also.
Examples are: Rock Salt and Halite

Igneous Rocks

By Troy

Igneous rocks are rocks that form from cooled magma or lava. There are 2 types of Igneous rocks: the ones that form under the surface of the earth (intrusive) and those that form at the surface of the earth (extrusive).

Intrusive Igneous Rocks		Extrusive Igneous Rocks	
A rock that forms under the surface of the earth from magma. Magma is molten rock that forms the mantle. Some igneous rocks have large crystals some have small the size of them is an indicator of how long it took them to cool. The larger the crystals the longer it took it to cool Example of intrusive rock: granite			Rocks that are cooled from lava as they are exposed to the air of the atmosphere or the water of the ocean. These have very small crystals because they cool very rapidly. They cool so rapidly that we sometimes find bubbles frozen into the rock where gasses did not escape before cooling. Examples of Extrusive rock are: basalt, obsidian, pumice, or pillow lava.

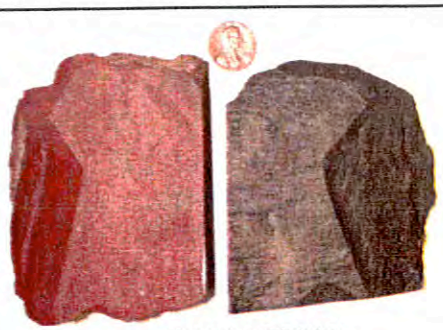
METAMORPHIC ROCKS

by Henri *and Amelia*

BANDS

Metamorphic rocks are rocks that start out in one form and "morph" or change into another form. Sedimentary and igneous can be changed into metamorphic, and metamorphic rocks can be changed into other metamorphic rocks too. Metamorphic rocks are transformed three general ways: heat, pressure, and chemical change. The heat and pressure can come from colliding continents or from hot magma pushing into nearby rock. In order for the minerals to change with heat and pressure, the rocks need to be deep in the earth where there are high temperatures and where the pressure builds up great enough so when two minerals soften, the pressure on them causes their component compounds to mold together, line up in new ways and make a new mineral. The pressure is also how bands and foliations form. Metamorphic rocks can also form through chemical change. Chemical change happens when very hot fluids and vapors fill the pores of existing rock. These vapors and hot fluids can cause chemical reactions over time, and can sometimes change the chemical make up of that rock.

Some ways to tell if the rock is metamorphic is by looking for bands or foliations. Bands can range from the size of a strand of hair to the width of your hands or even to the size of a car! Bands can be easy to miss so you have to look really carefully for these signs from up close and from far away. Another way to tell if it is metamorphic is by looking for signs of foliation. Foliations look like "sheeny-shiny" layers in a rock. Be careful because sometimes foliations might look like layers, but if you look close enough, you can see that they are really stuck together tightly and the minerals are all lined up in the same direction.



FOLIATION

ROCK NAME:
Sedimentary Breccia

PARK SECTION:
North park

ORIGIONAL LOCATION:
Barton cove, Gill, MA

WHAT YOU CAN OBSERVE TO LEARN ABOUT THIS ROCK:

Look for	Look for layers on this rock, and has fungi on it. The particles are really small. The colors to look for are, white, green (light and dark), and gray. There is no sheen or shine to this rock.
Touch and Feel	It feels bumpy and rough with very few smooth parts on it and is very jagged.
Look closely at	Look at the layers on it and see that it is very jagged and when you scratch the white mineral (Sand-like) it turns an orange like color. But some parts (were the fungi is) can be also hard but smoother then the jagged parts.

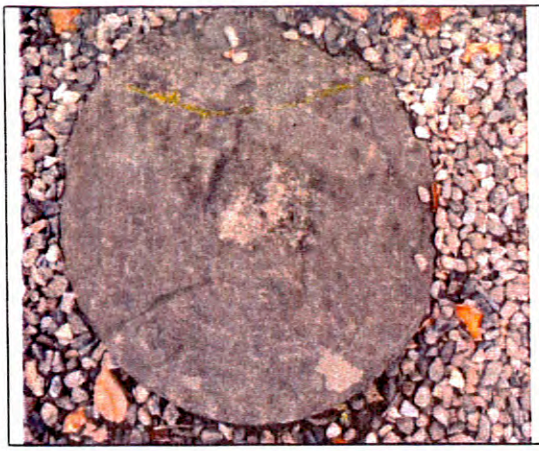
Rock Type(s):	**Rocks like this form when:**
It Is Sedimentary and Clastic	These rocks form when sand or mud that is compressed together at a high pressure with high heat.
How old is this rock?	**What is it made of?**
It is from the Jurassic period (145 to 205 million years ago)	Sand and Mud Grains

ROCKS ARE PIECES OF THE PAST

What can this rock tell us about the geologic history of the Connecticut River Valley?

I can tell that there had been water in the Connecticut river valley. Layers of sand and mud have been formed there over time and there has been pressure on it. The sand and mud gets formed together as it is burried deep in the earth over time and with enough pressure compacted and cemented and formed flat layers of my sedimentary rock. This rock also tells us that there may have been and probably was big deposits of sediment. The flat layers were broken up when there was an earthquake shaking and this caused faults in the earth's surace,which caused this rock to form.

The author of this page is: Alex Michael Age: 12 From Four Rivers Charter Public School 7th grades 2006



ROCK NAME:
Sandstone

PARK SECTION:
North

ORIGIONAL LOCATION:
The Russell Cutlery Company
Ruins next to the power canal.

WHAT YOU CAN OBSERVE TO LEARN ABOUT THIS ROCK:

Look for	First of all look at that unusual shape of the rock. Do you think it formed like that all by its self? If it did that rock would be really strange so there must have been some sort of event to shape it. Also look at the grains on the rock. See how fine they are. If you notice there's a different color shade in the middle of the rock.
Touch and Feel	Feel how rough the sandstone is and how the texture changes as you go toward the center white spot. Feel the different textures of the mineral in the spot.
Look closely at	Look closely at the sides of the rock (not too close to the middle) if you look close enough you can see how finely grained the rock is. Look in the middle if you look hard enough you can see traces of crystal/glassy minerals called quartz. There are also little bits of mica. In the middle there are also signs of rotting.

Rock Type(s):	**Rocks like this form when:**
Sedimentary/Clastic	When sand is buried and has pressure applied to it, not too much pressure other wise it would be metamorphic.
How old is this rock?	**What is it made of?**
Unknown	Sandstone and little bits of quartz and mica.

ROCKS ARE PIECES OF THE PAST

What can this rock tell us about the geologic history of the Connecticut River Valley?

This rock tells us that it must have been brought here from some where else. With that information we can tell that people brought it here and was used as a grinding wheel at some house in a town or village. Meaning there was a settlement there before and that there were people here before us. Long before that could happen, in order for the sandstone to form, sediment must have been buried under lots of other sediment and had lots of pressure applied to it to make it a solid rock. After a while, it must have been brought back to the surface and got discovered and got reshaped by people.

The author of this page is: Amelia Age: 12 From Four Rivers Charter Public School 7th grades 2006

ROCK NAME:
Stockbridge Marble

PARK SECTION:
North

ORIGIONAL LOCATION:
Lee, MA

WHAT YOU CAN OBSERVE TO LEARN ABOUT THIS ROCK:

Look for	This rock is a dirty white and gray because of dirt and sap getting on it. Look for parts that are clean white. The breakage pattern is very interesting because it doesn't break in a certain way.
Touch and Feel	Feel the grains on the clean white part. These are all pieces of limestone stuck together by immense heat and pressure.
Look closely at	If you look closely at the limestone you'll see little grains stuck together.

Rock Type(s):	**Rocks like this form when:**
Metamorphic (regional)	Shells, calcite, and mud are crushed to make the parent rock, limestone which is metamorphosed into marble, by immense pressure and heat.
How old is this rock?	**What is it made of?**
Cambrian Period	Limestone is made of shells, calcite, and mud. Marble

ROCKS ARE PIECES OF THE PAST

What can this rock tell us about the geologic history of the Connecticut River Valley?

It tells us that there used to be warm shallow seas here because that's what you need to provide the mud, shells, and calcite. These warm shallow seas were most likely off the coast of Laurentia and Baltica, the micro continents that later formed North America. There also needed to be a source of heat and pressure to metamorphose it which happened later.

The author of this page is: Zach Age: 13 From F our Rivers Charter Public School 7th grade 2006

ROCK NAME:
Arkose Sandstone

PARK SECTION:
North

ORIGIONAL LOCATION:
Turners falls, MA

WHAT YOU CAN OBSERVE TO LEARN ABOUT THIS ROCK:

Look for	Look for mud cracks, this means this rock is sedimentary.
Touch and Feel	Feel how the rock surrounding the cracks is different for the rock inside the cracks. The rock surrounding the cracks is the mud which cracked and the rock inside the cracks is sand.
Look closely at	Look closely at sandstone to see if you can see the little grains of sand.

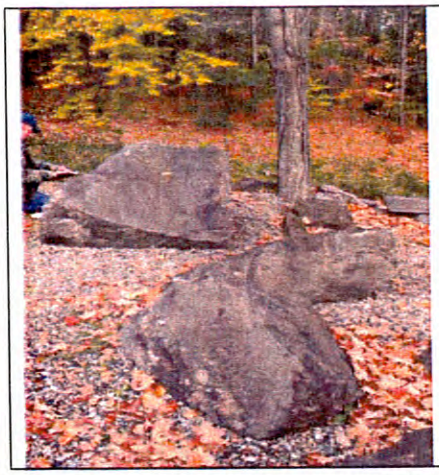
Rock Type(s):	**Rocks like this form when:**
Sedimentary Clastic	When Mud dries out the rock gets cracks and then sand might get into the cracks or something else then it rains and it shrinks with the stuff still in it and this repeats its self until it gets really hard or "turns" to stone.
How old is this rock?	**What is it made of?**
Jurassic period (208,000,000 to 144,000,000 million years ago)	This rock has Quartz sandstone, and some feldspar

ROCKS ARE PIECES OF THE PAST

What can this rock tell us about the geologic history of the Connecticut River Valley?

There was thick layer mud in Turners Falls that maybe slide down and or it was raining so there was a mud slide and or it rained and when it hit the bottom of where ever it was falling so when it stop raining or stoped doing whatever to make it damp it dryed up and made mud cracks. Then the same thing happened again to make layers and layers eventually it gets pressed down and smushed with the weight of the layers above. Then some kind of mineral crystialized to cement it together so it does not fall apart. The reason we can still see the mudcracks is because the mud layer hardend and kept the cracks from coming together. Its kind of like a fossil of the weather or climate from the Jurassic period.

The author of this page is: William Age: 13 From: Four Rivers Charter Public School 7th grade 2006



ROCK NAME:
Conglomerate with Armored Mud Balls

PARK SECTION:
North

ORIGIONAL LOCATION:
Turners Falls

WHAT YOU CAN OBSERVE TO LEARN ABOUT THIS ROCK:

Look for	Look for large chunks of other rocks embedded in the main rock, which is actually mud. These minerals are for the most part quite large only the mica is not visible at a glance but you can see the mica shimmer.
Touch and Feel	The greater part of the rock is smooth but the embedded rocks make the texture of the rock as a whole quite rough.
Look closely at	Look closely at the embedded rocks but especially the mica. The color of mica in this rock is a silver/gold mixture. Mica comes in very thin sheets and in this rock it is only found in small amounts.

Rock Type(s):	**Rocks like this form when:**
Sedimentary Clastic	Hard mud falls into a stream bed and starts to travel down the stream continuing to soften as it gets wet. Once the mud, though still hard and in a ball, is sticky it will start to pick up the pebbles along the stream bed creating the "armor" in the name.
How old is this rock?	**What is it made of?**
Jurassic Period 200 million years ago	Mica, Quartz, Feldspar & Mud

ROCKS ARE PIECES OF THE PAST

What can this rock tell us about the geologic history of the Connecticut River Valley?

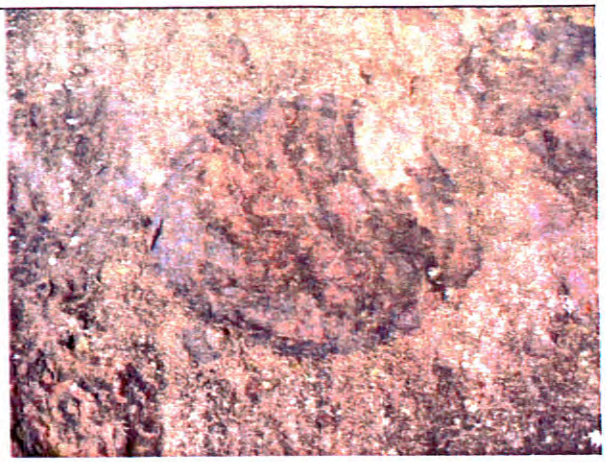
My rock tells us that there was a stream with muddy banks that at one point went through where this rock was found. This particular stream had the sediments of mica, quartz, feldspar and of course mud.

The author of this page is: Carin Age: 12 From Four Rivers Charter Public School 7th grade 2006

ROCK NAME:
Armored Mud ball

PARK SECTION:
North

ORIGIONAL LOCATION:
Cheapside Quarry, East Deerfield



WHAT YOU CAN OBSERVE TO LEARN ABOUT THIS ROCK:

Look for	You should be looking for the large brown circles all over it they are trapped rocks (find out more under "Look Closely at") They were stuck there when it was mud rolling along in a river.
Touch and Feel	This rock doesn't have much of a special texture it is very bumpy and rough like most rocks.
Look closely at	If you look very closely at this rock you will notice it has some brown circles on it they are rocks that were stuck there when the rock was formed. They are kind of like the chocolate chips in a cookie with the rock being the cookie.

Rock Type(s):	**Rocks like this form when:**
Sedimentary	Different rock stick together to make a new rock.
How old is this rock?	**What is it made of?**
From the Jurassic Period	Mud and Rocks

ROCKS ARE PIECES OF THE PAST

What can this rock tell us about the geologic history of the Connecticut River Valley?

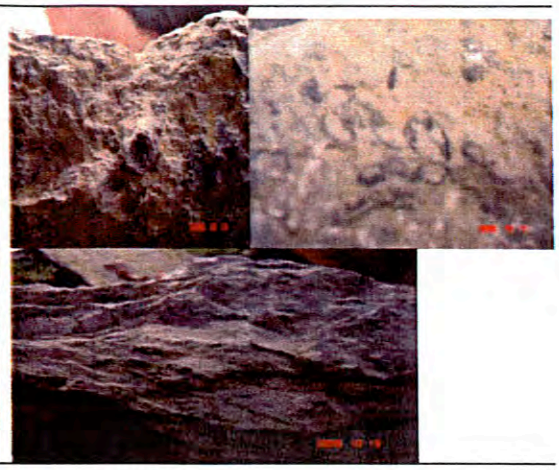
As I said earlier this rock is an armored mud ball. An armored mud ball is a rock that was mud that fell into the water the mud rolled along becoming rounder and rounder as it went and started to get sticky. Soon it started picking up rocks and the rocks stuck to it and then the rock stopped rolling and was burried in mud. Over time the rocks that stuck to the mud fused, wich is a fancy word for stuck, together and made themselves into "armor" and now they are one rock and that is rock is called an armored mud ball and there are many other mud balls through out the park.

The author of this page is: Jake Age: 12 From Four Rivers Charter Public School 7th grade 2006

ROCK NAME:
Limestone

PARK SECTION:
North Park

ORIGIONAL LOCATION:
Helderberg Mountains, NY



WHAT YOU CAN OBSERVE TO LEARN ABOUT THESE ROCKS:

Look for	Look for fossils in the rock and if there is that would tell you that it is sedimentary. Also limestone is usually tan or grey, but can also be white.
Touch and Feel	In my rock you can feel the fossils. You can feel the skeletal structure of the little organism that once lived. You can really feel the texture of most of the rocks, for an example on one of the limestone rocks, its' texture is really bumpy, it has tiny bumps all over it, unfortunately I did not
Look closely at	If you look closely you can see the tiny fossil shells in the upper right corner of the screen. You can also see the layers in the rock right below it. You can also see the fossilized coral colonies in the rock in the lower left corner.

Rock Type(s):	**Rocks like this form when:**
This rock is organic sedimentary.	Remains of living organisms deposited in thick layers, and get compacted.
How old is this rock?	**What is it made of?**
This rock is from the early Paleozoic era. The Paleozoic spanned from roughly 542 MYA to roughly 251 MYA. MYA= Million years ago	This rock is made of the minerals calcite, aragonite, and dolomite. It also may have impurities such as clay, sand, iron oxides, hydroxides, and organic materials.

ROCK ARE PIECES OF THE PAST

What can this rock tell us about the geologic history of the Connecticut River Valley?

The limestone specimens were brought from the Helderberg Mountains, NY because they no longer exist in the Connecticut River Valley. With that I can say that there was a sea in NY or where NY was which was on the shore of Laurentia which was a microcontinent in the Paleozoic era. They formed because shells collected at the bottom of a sea bed after the organisms died, and started getting more compacted by the weight of all the sediment on top of it. I know there were shells in it because there is Calcite which is secreted by the organism to make the shell.I know it's a marine rock because it has sea shells in it.

The author of this page is: Crispin Age: 13 From Four Rivers Charter Public School 7th grade 2006

ROCK NAME:
Limestone with fossils

PARK SECTION:
North

ORIGIONAL LOCATION:
Helderberg mountains, Eastern New York

WHAT YOU CAN OBSERVE TO LEARN ABOUT THIS ROCK:

Look for	Look for a rough bumpy texture. It kind of looks like dinosaur skin. You can also look for look for medium sized shells in the rock.
Touch and Feel	The rock will feel like a lot of bubbles all together, but the bubbles are as hard as rock.
Look closely at	Look closely at all the little shells and sponge-like things.

Rock Type(s):	**Rocks like this form when:**
Sedimentary Organic	A lot of little dead animals/plants die and are compressed together.
How old is this rock?	**What is it made of?**
Ordovician and early Devonian 505mya to 409mya	The rock is made from dead compressed mini shells.

ROCKS ARE PIECES OF THE PAST

What can this rock tell us about the geologic history of the Connecticut River Valley?

This rock can tell us that there was a shallow warm ocean around the CT river valley. If this fact is true, then the ocean must have dried up, or the continents must have shifted. So my rock is evidence of contenental drift.

The author of this page is: Kyle Age: 13 From Four Rivers Charter Public School 7th grade 2006

ROCK NAME:
Mud Cracks

PARK SECTION:
North

ORIGIONAL LOCATION:
New Salem, eastern New York

WHAT YOU CAN OBSERVE TO LEARN ABOUT THIS ROCK:

Look for	Lots of cracks that sink into the rock. A lot of layers are on the rock.
Touch and Feel	You can feel all the cracks on the rock, and you can also feel all the layers. And there are some bumps in some places that you can feel.
Look closely at	Look closely at all the cracks in the rock. These cracks tell us that this rock is made up of dried up mud.

Rock Type(s):	Rocks like this form when:
Sedimentary, Clastic	There was erosion, and then all the mud got deposited. And all of the mud dried up and cracked. Then all the layers got compacted together by the weight of the layers above. All the layers got cemented together by dissolved minerals crystallize and "glue" particles together.
How old is this rock?	**What is it made of?**
Ordovician Period About 400 years ago	Limestone and Calcite

ROCKS ARE PIECES OF THE PAST

What can this rock tell us about the geologic history of the Connecticut River Valley?

This rock tells us that at one point there was mud that dried up and formed into rocks. This rock is one of many rocks that is made up of dried up mud.

The author of this page is: Sierra Age: 12 From Four Rivers Charter Public School 7th grade 2006

ROCK NAME:
Arkose Sandstone
PARK SECTION:
North
ORIGIONAL LOCATION:
Turners falls, MA

WHAT YOU CAN OBSERVE TO LEARN ABOUT THIS ROCK:

Look for	Look for mud cracks, this means this rock is sedimentary.
Touch and Feel	Feel the how the mud cracked when it was dry. Then sand fell in to the cracks of the mud of the mud and when it rained more sand went into the crack and when it dried out and was buried deep underground the sand and the cracks both hardened and the rock turned into a sedimentary rock.
Look closely at	Look at the mud cracks and how they are formed on the rock so you can see how they were made this means this rock was once mud and somehow dried, and it means it is sedimentary.

Rock Type(s):	**Rocks like this form when:**
Sedimentary Clastic	When Mud dries out
How old is this rock?	**What is it made of?**
Jurassic	This rock has Quartz sandstone, and some feldspar

ROCKS ARE PIECES OF THE PAST

What can this rock tell us about the geologic history of the Connecticut River Valley?

There was something in Turners Falls that maybe slide down and or it was raining so there was a mud slide and or it rained andwhen it hit the bottom of where ever it was falling so when it stop raining or stoped doing whatever to make it damp it dryed up and made mud cracks then it sat there for the longest time and it hardend and hardend so it was finnaly they made that place the Turners Falls Sandstone area so they took it out and they put it into the GCC Rock Park.

The author of this page is: William – Age: 13 From Four Rivers Charter Public School 7th grade 2006

ROCK NAME:
Dinoprint

PARK SECTION:
North

ORIGIONAL LOCATION:
UNKNOWN

WHAT YOU CAN OBSERVE TO LEARN ABOUT THIS ROCK:

Look for	A flat, grey rock with very fine particles. And low ridges.
Touch and Feel	Feel for three bumps shaped like this; |/ They are the cast of a dinosaur footprint.
Look closely at	Look for layers on the side.

Rock Type(s):	Rocks like this form when:
Sedimentary (Clastic)	Mud layers get compressed by weight of more layers and cemented by ground water that containes minerals.
How old is this rock?	**What is it made of?**
Jurassic period, Mesozoic Era 144mya-208mya	Shale made of clay minerals: calcium carbonate, iron, feldspar silica

ROCKS ARE PIECES OF THE PAST

What can this rock tell us about the geologic history of the Connecticut River Valley?

Dinosaur stepped in mud and left a track on the supercontinent of Pangea. The track then got covered with more layers of sediment and ground water that contains minerals that crystalize out and cement the mud particles together into a rock.

The author of this page is: Gar y (Ski) Age: 14 From Four Rivers Charter Public School 7th grade 2006

ROCK NAME:
Gneiss and Schist

PARK SECTION:
North

ORIGIONAL LOCATION:
New Hampshire

WHAT YOU CAN OBSERVE TO LEARN ABOUT THIS ROCK:

Look for	You should look for a rock with ripples, and odd shapes and dips. It looks like it has layers but it is just foliation. The ripples almost look like book pages. That shape is the one on left side of the rock. The rock also looks very uneven and its shape looks very bumpy but the texture is smooth. There are also very little, shiny minerals
Touch and Feel	The rock is smooth in some parts and bumpy in others. It has many dips so your hand will never run flat over it. Your hand will be going up and down all the time. When you go over the "book pages" area your hand feels like it is going over thick, stone book pages.
Look closely at	If you look at this rock closely you will see little shiny parts in it. Those shiny parts are a mineral called Mica. Mica is very small and can split in sheets.

Rock Type(s):	**Rocks like this form when:**
Metamorphic (regional)	This rock forms when continents collide or ocean crust of continental bed rock are bent and folded.
How old is this rock?	**What is it made of?**
Paleozoic era 240-250 million years ago	Mica, Quartz, Schist, and Gneiss

ROCKS ARE PIECES OF THE PAST

What can this rock tell us about the geologic history of the Connecticut River Valley?

This rock was formed deep under ground and got bent and folded. The rock was bent by the metamorphism the rock went through.
The glaciers were causing erosion to the ground and dug up the rock. The glaciers picked up the rock and carryed it from place to place. This rock was exposed to the cold weather and was moved a lot since then.

The author of this page is: Shannon Marie Age: 13 From Four Rivers Charter Public School 7th grade 2006

WHAT YOU CAN OBSERVE TO LEARN ABOUT THIS ROCK:

ROCK NAME:
Mica Schist

PARK SECTION:
North

ORIGIONAL LOCATION:
Northfield ,MA

Look for	You can look for purplish colored Garnets and lots of specks of Mica. It is gray with a greenish tint in some of the layers. The layers aren't very big but noticeable.
Touch and Feel	This rock is very rough and very hard, but only in some parts. Some parts are very soft, so soft you can pick it off. You can also feel the small rough layers.
Look closely at	By looking closely you can see the Garnets shape. They look as if they have been shaped. The edges are very angular looking.

Rock Type(s):	Rocks like this form when:
Metamorphic (regional)	Continents collide or ocean crust sub ducts large areas of continental bedrock. This pressure causes the rocks to have a bumpy shape as the original rock gets deformed. The minerals create a metamorphic rock that has them all mixed together.
How old is this rock?	**What is it made of?**
From the Paleozoic era 540-250 MYA,	Muscovite, biotite, chlorite or horn blend

ROCKS ARE PIECES OF THE PAST

What can this rock tell us about the geologic history of the Connecticut River Valley?

This kind of rock could have formed in the Paleozoic time. The earth's heat had created this rock to have a shinny look to it. It's also made this rock become metamorphic.This rock tell us that there were once continents colliding together millions and millions of years ago. Before that some of the sediments were also mixing together, and created the original sedimentary rock that got metamorphosed.

The author of this page is: Meredith Age: 12 From Four Rivers Charter Public School 7th grades 2006

WHAT YOU CAN OBSERVE TO LEARN ABOUT THIS ROCK:

ROCK NAME:
Mica Schist

PARK SECTION:
North

ORIGIONAL LOCATION:
Northfield ,MA

Look for	You can look for purplish colored Garnets and lots of specks of Mica. It is gray with a greenish tint in some of the layers. The layers aren't very big but noticeable.
Touch and Feel	This rock is very rough and very hard, but only in some parts. Some parts are very soft, so soft you can pick it off. You can also feel the small rough layers.
Look closely at	By looking closely you can see the Garnets shape. They look as if they have been shaped. The edges are very angular looking.

Rock Type(s):	Rocks like this form when:
Metamorphic (regional)	Continents collide or ocean crust sub ducts large areas of continental bedrock. This pressure causes the rocks to have a bumpy shape as the original rock gets deformed. The minerals create a metamorphic rock that has them all mixed together.
How old is this rock?	**What is it made of?**
From the Paleozoic era 540-250 MYA,	Muscovite, biotite, chlorite or horn blend

ROCKS ARE PIECES OF THE PAST

What can this rock tell us about the geologic history of the Connecticut River Valley?

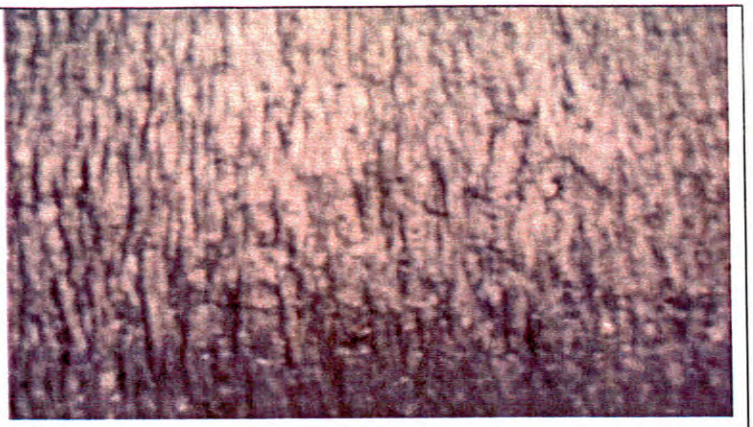
This kind of rock could have formed in the Paleozoic time. The earth's heat had created this rock to have a shinny look to it. It's also made this rock become metamorphic.This rock tell us that there were once continents colliding together millions and millions of years ago. Before that some of the sediments were also mixing together, and created the original sedimentary rock that got metamorphosed.

The author of this page is: Meredith Age: 12 From Four Rivers Charter Public School 7th grades 2006

ROCK NAME:
Mica Schist a.k.a. "Goshen Stone"

PARK SECTION:
North

ORIGIONAL LOCATION:
Goshen, MA



WHAT YOU CAN OBSERVE TO LEARN ABOUT THIS ROCK:

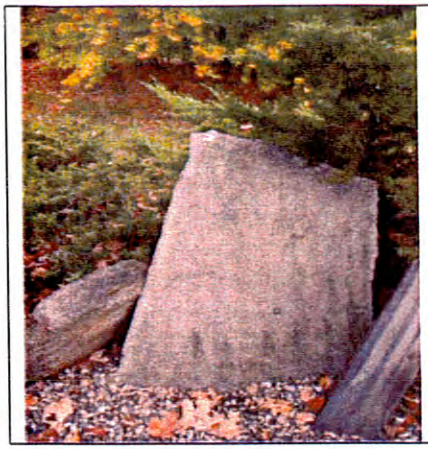
Look for	Look for layers in the post which is caused by metamorphism also in the processes of metamorphism Garnet {a mineral}is pushed together into a layer.
Touch and Feel	Touch and feel the waviness on the surface and the rough texture on the edges.
Look closely at	Look closely at the shape of the silver rough crystal, notice the irregular shapes of minerals

Rock Type(s):	**Rocks like this form when:**
Metamorphism(Regional)	They form when magma injects minerals into muddy ocean sediment.
How old is this rock?	**What is it made of?**
Devonian Period	Mica, garnet

ROCKS ARE PIECES OF THE PAST

What can this rock tell us about the geologic history of the Connecticut River Valley?

Because we know this rock was once muddy ocean sediment we can infer that the Connecticut River Valley was once a ocean. Then an event occurred that put the rock under extreme heat and pressure and made it metamorphose into schist.



ROCK NAME:
Mica schist with hornblende
A.K.A. "Crystal Crowsfoot"

PARK SECTION:
North

ORIGIONAL LOCATION:
Ashfield, Massachusetts

WHAT YOU CAN OBSERVE TO LEARN ABOUT THIS ROCK:

Look for	Distinct crows foot design. These are dark and are made of hornblende. The small shiny points are made of mica.
Touch and Feel	You can feel the smooth side although it was cut by a saw so you won't find it naturally like this. So the sides are the rough naturally and feel a bit like sand paper.
Look closely at	Look at the small bits of mica (it will shine). Look at the crystals that make the crow's feet pattern which many people mistake for fossils.

Rock Type(s):	**Rocks like this form when:**
Metamorphic regional Previously a sedimentary mud stone	Continental plates collide and the rocks are put under pressure and heat for millions of years
How old is this rock?	**What is it made of?**
Ordovician Period 505- 438 mya	quartz, feldspar, Mica, Hornblende

ROCKS ARE PIECES OF THE PAST

What can this rock tell us about the geologic history of the Connecticut River Valley?

This rock needed to be in a ancient lakebed and to be exposed to tons of pressure for millions of years inside the Connecticut River Valley. I know this has happened because this paticular rock needs to be heated and pressured to form hornblende crowfeet. This tells me at one point the Connecticut River Valley was under pressure and heat for several million years. This happened when the muddy ocean floor was crushed between the Bronson Hill Plate and Laurentia (close to western Massachusetts). During this time the floor was subducted and put under heat and strain for millions of years.

The author of this page is: Kevin Age: 13 From Four Rivers Charter Public School 7th grade 2006

ROCK NAME:
Anvil stone

PARK SECTION:
North park

ORIGIONAL LOCATION:
Unknown

WHAT YOU CAN OBSERVE TO LEARN ABOUT THIS ROCK:

Look for	Look for the little shiny specks of mica on the rock
Touch and Feel	Feel the rough, bumpy edges of the rock that is made of schist that formed where the marble wore out
Look closely at	Look closely at the shape of the rock. Can you see where wind rain and water weathered the softer rock? Witch parts of the rock were too hard to get washed away?

Rock Type(s):	Rocks like this form when:
Metamorphic, regional	Rock like this forms when there is a magma pocket under ground so the rock holding it in changes from heat and pressure.
How old is this rock?	**What is it made of?**
Devonian period Paleozoic Era	The minerals that makes up my rock are quartz and mica impure marble and schist. Schist stayed when the marble wore out because schist is harder than marble.

ROCKS ARE PIECES OF THE PAST

What can this rock tell us about the geologic history of the Connecticut River Valley?

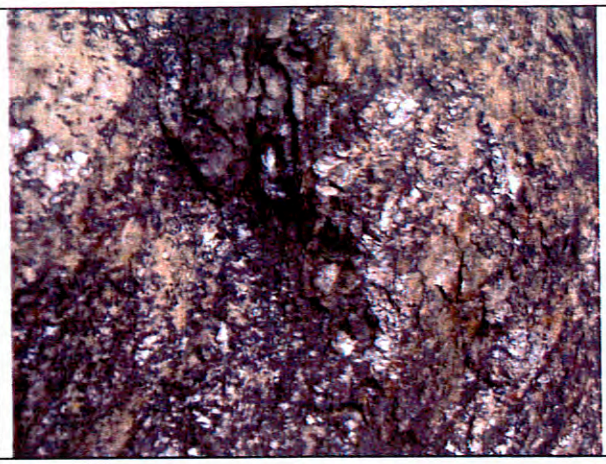
When the marble wore out the shist stayed because schist is harder than marble. That is why the center wore out and the top and bottom stayed. The location where this rock was found is unknown but I think it must have been in a swift river water somewhere because of the way the center was wearing out.

The author of this page is: Lucas Age: 12 From Four Rivers Charter Public School 7th grade 2006

ROCK NAME:
Pegmatite

PARK SECTION:
Central

ORIGIONAL LOCATION:
Gilsum NH and Goshen MA



WHAT YOU CAN OBSERVE TO LEARN ABOUT THIS ROCK:

Look for	Look for one solid color with many different colored specks all over and fairly large crystals.
Touch and Feel	If you rub your hand or finger over the rock, you'll feel very bumpy parts, but parts that are less bumpy on the larger crystals. Or you could take your fingernail or a dull knife, and poke at the small shiny rocks, if it chips into flakes, it is muscovite mica.
Look closely at	If you look closely, you will see that there are black specks on the rock that stand out from the white.

Rock Type(s):	**Rocks like this form when:**
Intrusive Igneous Rock	They cool underground formed very hot magma (lava that's underground)
How old is this rock?	**What is it made of?**
This rock is from the Devonian age (360 to 400 million years ago)	This rock is made of Quartz, Feldspar and muscovite mica

ROCKS ARE PIECES OF THE PAST

What can this rock tell us about the geologic history of the Connecticut River Valley?

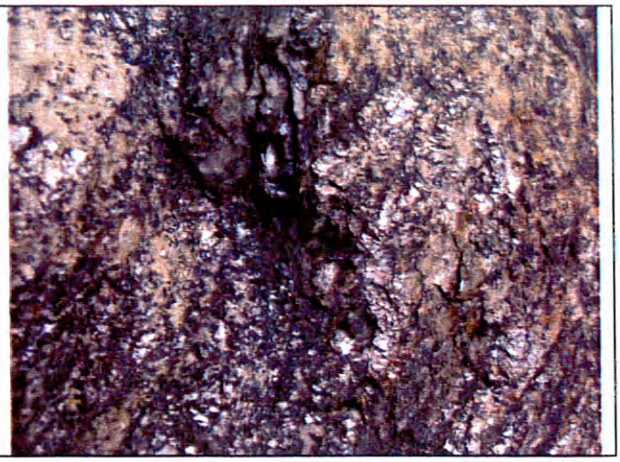
I can tell that my rock must have been underground from magma and also must have cooled slowly because it has large crystals. During the devonian there were continents colliding, so the magma chamber might have been under great pressure.

The author of this page is: Simon Age: 12 From Four Rivers Charter Public School 7th grade 2006

ROCK NAME:
Pegmatite

PARK SECTION:
Central

ORIGIONAL LOCATION:
Gilsum NH and Goshen MA



WHAT YOU CAN OBSERVE TO LEARN ABOUT THIS ROCK:

Look for	Look for one solid color with many different colored specks all over and fairly large crystals.
Touch and Feel	If you rub your hand or finger over the rock, you'll feel very bumpy parts, but parts that are less bumpy on the larger crystals. Or you could take your fingernail or a dull knife, and poke at the small shiny rocks, if it chips into flakes, it is muscovite mica.
Look closely at	If you look closely, you will see that there are black specks on the rock that stand out from the white.

Rock Type(s):	**Rocks like this form when:**
Intrusive Igneous Rock	They cool underground formed very hot magma (lava that's underground)
How old is this rock?	**What is it made of?**
This rock is from the Devonian age (360 to 400 million years ago)	This rock is made of Quartz, Feldspar and muscovite mica

ROCKS ARE PIECES OF THE PAST

What can this rock tell us about the geologic history of the Connecticut River Valley?

I can tell that my rock must have been underground from magma and also must have cooled slowly because it has large crystals. During the devonian there were continents colliding, so the magma chamber might have been under great pressure.

The author of this page is: Simon Age: 12 From Four Rivers Charter Public School 7th grade 2006

ROCK NAME:
Pegmatite intruding gneiss

PARK SECTION:
Central

ORIGIONAL LOCATION:
Orange, MA

WHAT YOU CAN OBSERVE TO LEARN ABOUT THIS ROCK:

Look for	2 different colors on opposite sides of the rock.
Touch and Feel	2 different textures on the different sides of my rock.
Look closely at	The differently sized and colored crystals that make up my rock.

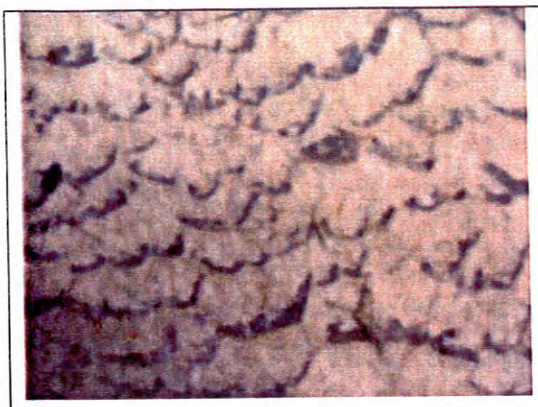
Rock Type(s):	**Rocks like this form when:**
Pegmatite intruding gneiss	There was a lot of heat and pressure.
How old is this rock?	**What is it made of?**
Late Ordovician Period (440-450 million years ago)	Pegmatite: quartz, feldspar, and mica Gneiss: mica, or black hornblende

ROCKS ARE PIECES OF THE PAST

What can this rock tell us about the geologic history of the Connecticut River Valley?

The metamorphic rock formed when two tectonic plates on Earths crust collided and heat and pressure melted and deformed older rock. Later an intrusion of magma came through the metamorphic rock and it then it hardened.

The author of this page is: Sam Age: 12 From Four Rivers Charter Public School 7th grades 2006



ROCK NAME:
Graphic granite

PARK SECTION:
Central

ORIGIONAL LOCATION:
Gilsum New Hampshire

WHAT YOU CAN OBSERVE TO LEARN ABOUT THIS ROCK:

Look for	You should look for ripples of see-through quartz that looks black because of that darkness behind them.
Touch and Feel	You should feel for bumpy texture and smooth parts.
Look closely at	Look closely at the white, soapy crystal. Notice that it is always rectangle shaped no matter where it is in the rock. This shape tells us that it is a mineral called feldspar. Also look for large grains which are tiny pieces that make up minerals.

Rock Type(s):	**Rocks like this form when:**
Igneous, intrusive	Magma cools inside the earth's surface slowly forming larger crystals.
How old is this rock?	**What is it made of?**
Devonian period, 367-408.5 million years ago	Feldspar and quartz

ROCKS ARE PIECES OF THE PAST

What can this rock tell us about the geologic history of the Connecticut River Valley?

It shows that there must have been magma under the surface that cooled very slowly forming larger crystals. This may have happened as 3 islands, Merrimack, Nashoba and Avalonia collided with Laurentia (the continent that eventually became North America.

The author of this page is: Kai Age:12 From Four Rivers Charter Public School 7th grade 2006

ROCK NAME:
Granite Porphyry

PARK SECTION:
Central

ORIGIONAL LOCATION:
Worcester County, MA

WHAT YOU CAN OBSERVE TO LEARN ABOUT THIS ROCK:

Look for	It is grey, black and white, with long lines called "mineral banding" made of feldspar. Quartz is a white stone that is translucent. All around that is a grayish blackish mixture of rock and some dark red crystals.
Touch and Feel	It feels rough and scratchy on the grey and black parts. On the quartz it feels glassy but bumpy. The garnet feels almost the same as the quartz, but is hard to touch because it's so small.
Look closely at	If you look really close at some parts of the rock you can see a dark red crystal called Garnet. On other parts you can look really, really closely and see a little, little bit of shiny silver stuff on the rock. That is Mica, and it is very delicate in such small quantities.

Rock Type(s):	**Rocks like this form when:**
First, it was intrusive igneous then a regional metamorphic rock	Intrusive means that the Igneous rock was formed beneath the surface of the earth. Then through regional metamorphism it was slightly metamorphosed into a metamorphic rock. That means that tectonic plates collided and created heat to metamorphose the rock.
How old is this rock?	**What is it made of?**
The Devonian period, 360-400 million years ago.	Garnet, feldspar, quartz, Mica, and Hornblende

ROCKS ARE PIECES OF THE PAST

What can this rock tell us about the geologic history of the Connecticut River Valley?

That there was hot magma here at one point in history during the Devonian period (360-400 million years ago). At that point there were three continents colliding and forming the acadian mountains: Merrimack, Nashoha, and Avalonia. There is no evidence supporting the idea that the magma ever came above the surface of the earth. I believe that it stayed below the earth because my rock is intrusive which means it formed below the surface. Because it was partially metamorphosed beneath the earth. (regional metamorphic)

The author of this page is: Zoë Age: **12** years old From Four Rivers Charter Public School 7th grade, 2006

ROCK NAME:
Granite (number 6)

PARK SECTION:
Central Park section

ORIGIONAL LOCATION:
Hatfield pluton, Hatfield, Massachusetts

WHAT YOU CAN OBSERVE TO LEARN ABOUT THIS ROCK:

Look for	The things you should look for in this rock are the purple minerals that are fluorite and the clear ones are quartz. You should also look at the crack in the rock that is filled with crystals.
Touch and Feel	The feel of this rock is rough and scratchy because of the crystals.
Look closely at	The things to look real closely at are the colors you see in the fluorite which are purple. You can especially see the purple on the rock that is right next to it that actually got broken off of it.

Rock Type(s):	**Rocks like this form when:**
Rock number 6 is igneous and intrusive which means it formed underneath the surface.	Rocks like this form when magma cools slowly under the surface. The slower the magma cools the bigger the crystals form.
How old is this rock?	**What is it made of?**
Rock number 6 is from the Devonian period 408mya to360mya(mya is millions years ago)	Granite is made of quartz, feldspar, and mica.

ROCKS ARE PIECES OF THE PAST

What can this rock tell us about the geologic history of the Connecticut River Valley?

This rock must have been formed by magma under ground because Granite is an intrusive rock which means it was formed under ground by magma that has been forced into chambers in the bedrock. This probably happened when the micro continents Merrimark, Nashaba and Avalonia crashed into Laurentia which provide the material that was melted by the mantle and that forced magma into the bedrock.

The author of this page is: Ben Age: 12 From Four Rivers Charter Public School 7th grades 2006

ROCK NAME
Calcite vein in Quartzite

PARK SECTION
Central

ORIGIONAL LOCATION:
West Northfield

WHAT YOU CAN OBSERVE TO LEARN ABOUT THIS ROCK:

Look for	This shiny black rock has large white crystals inside the parent rock. Look at how the white rock is above the parent rock. That means that there must have been some calcium carbonate inside the rock. The tan-like patches in the rock are actually calcite discolorations from when the rock was at the fault of an earthquake that deposited lava that eventually cooled and formed this magnificent rock.
Touch and Feel	Feel how smooth the white crystals of calcite are compared to the dark, rougher rock below it. This tells us they must be made of different rocks. The white crystal feels glassy and prickly. The white might look like salt but don't lick the rock because it isn't salt and it might taste nasty.
Look closely at	Look closely at the shape of the white soapy crystal; notice that it is always rectangle-shaped no matter where it is in the rock. This shape tells us that it is a mineral called calcite. If you look at the side facing the door and all the way across the rock you will see a light white band that goes around the whole rock. The white band is made of calcite.

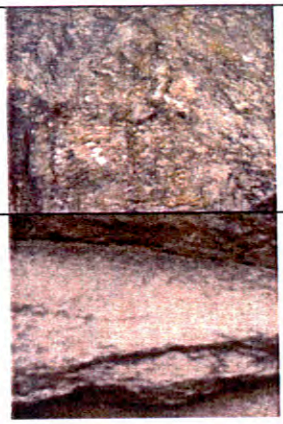
Rock Type(s):	**Rocks like this form when:**
Calcite, quartzite, tourmaline,	Crack in metamorphic rock got filled in by calcium carbonate deposited by groundwater
When was this rock formed?	**What is it made of?**
Paleozoic times: 530-540 mya to 250-mya	calcium carbonate

ROCKS ARE PIECES OF THE PAST

What can this rock tell us about the geologic history of the Connecticut River Valley?

Since this is an metamorphic rock, there must have been heat and pressure in the Earth's surface. The rock itself must have cracked as it cooled, and then those cracks were filled in with calcium carbonate that settled out of ground water.

The author of this page is: Bryan Willard Kernan Age: 14 Four Rivers Charter Public School 7th grade 2006



ROCK NAME:
Big Peg

PARK SECTION
Central

ORIGIONAL LOCATION:
Goshen

WHAT YOU CAN OBSERVE TO LEARN ABOUT THIS ROCK:

Look for	On metamorphic side you should look for Garnet crystal in schist with a sheeny look. But on the Igneous side you should look for shiny chips in the granite called mica and look at the granite.
Touch and Feel	Feel the large crystals in the granite and mica. Also feel the small crystals in the schist called garnet.
Look closely at	Look at the shape of the garnet crystals.

Rock Type(s):	Rocks like this form when:
Metamorphic contact and Igneous intrusive	The slow cooling Granite intruded on the Garnet schist and stuck together
How old is this rock?	**What is it made of?**
Devonian Period from 408 to 360 mya.	For the garnet schist, mica, pyrope, almandine, and for the granite mica fieldspar, quartz

ROCKS ARE PIECES OF THE PAST

What can this rock tell us about the geologic history of the Connecticut River Valley?

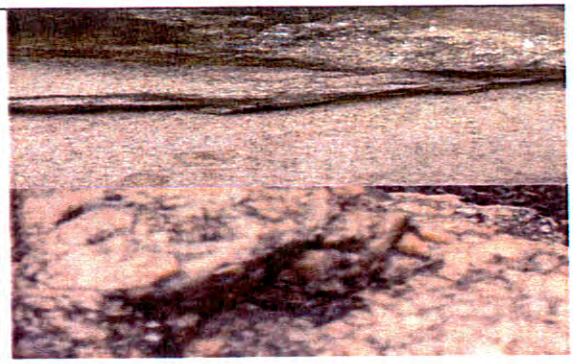
My rock shows us that there were under ground magma pools which cooled and intruded on some garnet schist under ground. What could have happened was at the time there were three micro-continents called Merrimack, Nashoba, Avalonia that hit North America as the continents shifted around the globe, the new magma melted from the collision intruded on the schist.

The author of this page is: Dan Age:13 From Four Rivers Charter Public School 7th grade 2006

ROCK NAME:
Granite intrusion into gneiss

PARK SECTION:
Central

ORIGIONAL LOCATION:
Unknown



WHAT YOU CAN OBSERVE TO LEARN ABOUT THIS ROCK:

Look for	Look for the large crystals on the upper left side of the rock. They tell us that this rock was formed underground by magma.
Touch and Feel	Feel the salt and pepper colored side of the rock. It feels rough, and you can tell this rock has large crystals.
Look closely at	Look closely at the bands in the lower right half of the rock. They are small and thin, so make sure you notice. The bands tell you that this rock is metamorphic.

Rock Type(s):	Rocks like this form when:
Metamorphic (regional) and Igneous (intrusive)	The rock formed underground with magma. The regional part was formed when two rocks collided.
How old is this rock?	**What is it made of?**
Unknown	Feldspar, hornblende, quartz, and mica = Granite Feldspar, hornblende, quartz, and mica = Gneiss

ROCKS ARE PIECES OF THE PAST

What can this rock tell us about the geologic history of the Connecticut River Valley?

The gneiss and the granite are both stuck together, so from that you can tell they were put together through regional Metamorphism because if it was contact, then both rock types would be more mixed together. But they don't, so the must have cooled slowly together since they are both clearly separated. Because gneiss is metamorphic, it must have once been another rock.

The author of this page is: Gabby Age: 13 From Four Rivers Charter Public School 7th grade 2006

ROCK NAME:
Granite

PARK SECTION:
Central

ORIGIONAL LOCATION:
Winchester, NH

WHAT YOU CAN OBSERVE TO LEARN ABOUT THIS ROCK:

Look for	Light colored crystals that have a rectangular shape, this is feldspar. Dark parts scattered around the rock, this is called hornblende. Tiny sparkles all over the rock, this is mica. Purplish crystals in a little indent in the rock, this is quartz.
Touch and Feel	Feel how smooth the white crystals of calcite are compared to the dark, rougher rock below it. The dark part of the rock is bumpy. And the smooth purple crystals with points on the end, quartz.
Look closely at	Look closely at the shape of the white soapy crystal, notice that it is always rectangle shaped no matter where it is in the rock. This shape tells us that it is a mineral, called feldspar. The dried glue covering the cracks protects the rock from the effects of weathering.

Rock Type(s):	**Rocks like this form when:**
Igneous, intrusive	Magma cools underground. It is called intrusive
How old is this rock?	**What is it made of?**
Devonian period 360,000,000 - 408,000,000	It is made of minerals called feldspar, mica, quarts, and hornblende

ROCKS ARE PIECES OF THE PAST

What can this rock tell us about the geologic history of the Connecticut River Valley?

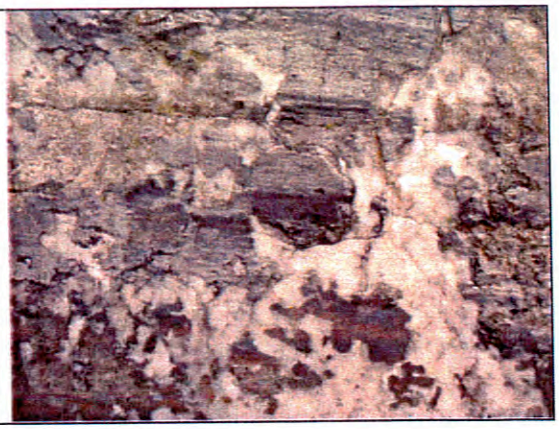
This rock tells us there is magma underground that slowly cooled to form granite. Since it slowly cooled, it formed big crystals. During the Devonian period, three tiny continents called Merrimack, Nashoba, and Avalonia collided with another continent called Laurentia, maybe forcing magma into the bedrock, then the magma cooled slowly into granite.

The author of this page is: Jessica Age: 12 From Four Rivers Charter Public School 7th grade 2006

ROCK NAME:
Slickenside

PARK SECTION:
South

ORIGIONAL LOCATION:
East Deerfield



WHAT YOU CAN OBSERVE TO LEARN ABOUT THIS ROCK:

Look for	Look for square off-white crystals. This particular mineral is calcite. Also look at the smooth shiny rock this is called basalt.
Touch and Feel	Notice that the calcite is rough and in crystals but the basalt is smooth, flat and shiny
Look closely at	Look closely at the basalt notice that it's shiny and slick, this is the melted part of the rock the rest was the part that did not undergo the intense friction

Rock Type(s):	**Rocks like this form when:**
My rock is an igneous and intrusive	They form when the plates or moving rock shift and the friction causes the rock to melt and the basalt is momentarily melted forming a smooth flat rock
How old is this rock?	**What is it made of?**
It formed in the Early Jurassic It is about 200,000,000 years old	Calcium-sodium, feldspar, and iron-magnesium

ROCKS ARE PIECES OF THE PAST

What can this rock tell us about the geological history of the Connecticut River Valley

As I found out this type of rock forms when large amounts of rock move and the friction melts the rock and forms it in basalt sheets. In order for this to happen I can infer that there must have been some kind of event the shifted large amounts of rock like a earthquake. This rock probably formed as Pangaea pulled apart.

The author of this page is: Troy Harrington Age: 13 From Four Rivers Charter Public School 7th grade 2006

ROCK NAME:
Flow Top

PARK SECTION:
South

ORIGIONAL LOCATION:
Cheapside Quarry

WHAT YOU CAN OBSERVE TO LEARN ABOUT THIS ROCK:

Look for	Look for the air bubbles that can be seen in stripes on the top. The bubbles tell us that it had parts open to cool fast and some enclosed parts cooled slower.
Touch and Feel	You can feel the rough places with bubbles and the smoother places that were under more pressure.
Look closely at	Look at the flat side and you may see small mica crystals. The very small mica says that it may have cooled slower than the rest.

Rock Type(s):	**Rocks like this form when:**
Igneous and extrusive	Lava comes out of earth and cools fast.
How old is this rock?	**What is it made of?**
The Mesozoic era. 200,000,000 years ago. Jurassic Period.	Plagioclase Feldspar and Pyroxene.

ROCKS ARE PIECES OF THE PAST

What can this rock tell us about the geologic history of the Connecticut River Valley?

This rock formed when a lava flow opened as Pangea was cracking apart, and this rock was in a flow. Igneous rocks are all over the Connecticut River Valley. This tells us that lava covered the valley.

The author of this page is: Travis Age: 13 From Four Rivers Charter Public Schools 7th grade 2006

ROCK NAME:
Breccias

PARK SECTION:
South

ORIGIONAL LOCATION:
Unknown

WHAT YOU CAN OBSERVE TO LEARN ABOUT THIS ROCK:

Look for	Look for light colored crystals called calcite. These crystals show it must have had minerals from water precipitate and form into cracks in the rock.
Touch and Feel	Feel the large cracks all the way through it which shows it must have been through an earthquake, or eruption.
Look closely at	Look closely at the grayish rock this is basalt but it has been tinted by the crystal calcite, the calcite turned it more green than normal.

Rock Type(s):	Rocks like this form when:
Igneous, extrusive	Lava flows from a volcano or when it reaches the surface somehow and then cools.
How old is this rock?	**What is it made of?**
Jurassic age 206-144 million years ago.	Mainly consists of calcite, and basalt includes quartz, feldspar, hematite, olivine, apatite, pyroxene, biotite, magnetite, amphibole, and ilmenite.

ROCKS ARE PIECES OF THE PAST

What can this rock tell us about the geologic history of the Connecticut River Valley?

It tells us that there might have been some way for lava to flow out and cool. As the rock traveled it got damaged. As you can see it has many cracks so there must have been an earthquake that would have damaged the volcanic rock. The earthquake would have cracked the rock which is why it is cracked right now. This all could have happened in the Jurassic period from the continents pulling farther apart, earthquakes, and fissures or lava flows coming up through the ground and covering the land in up to 700 feet of molten rock.

The author of this page is: Sebstien Age: 13 From Four Rivers Charter Public School 7th grade 2006

ROCK NAME:
Basalt

PARK SECTION:
South park

ORIGIONAL LOCATION:
The ridges of Holyoke range, or Pocumtuck Range in Greenfield and Deerfield

WHAT YOU CAN OBSERVE TO LEARN ABOUT THIS ROCK:

Look for	Look for the orange color on the top, this shows that it may be rust which means that it has iron in it. Also its shape is sort of cool. It is shaped kind of like a straight hexagonal thing. This means that a column basalt. If you're just taking a quick glance at it you will notice is has a grayish color.
Touch and Feel	My rock has a fairly interesting feel to it. On the top it feels smooth and a little oily. On the sides it is rough and on the corners sort of pointy. Only in some places it will feel smooth on the sides. It may be smooth because some pieces have fallen off.
Look closely at	When looking closely at my rock you may see many things. You can get a clear view of the interesting texture on it. If you are lucky you might see some of the shrinkage cracks. These are where the rock had to crack because of rapid cooling.

Rock Type(s):	Rocks like this form when:
My rock is Igneous extrusive. I know this because it does not have air bubbles trapped in it like some extrusive rocks. Also you can see the grains fairly easy. Also lots of extrusive rocks are sort of light, but my igneous rock is heavy.	Lava oozes out of the cracks in the earth, forms deep pools of lava covering the land and cools into hexagonal shapes are formed like this one.
How old is this rock?	**What is it made of?**
Around 200,000,000 years old Probably during the Pennsylvanian period	Hardened Lava

ROCKS ARE PIECES OF THE PAST

What can this rock tell us about the geologic history of the Connecticut River Valley?

This rock tells us that cracks opened up in the earth from conteneintal plates colliding, then lava ozzed out of them. When it reached the surface the lava immediately started to cool. When it is fully cooled hardened and has had some presure the lava started to crack into a sort of hexagonal shape which formes the collumns.

The author of this page is: Calvin — Age: 13 — From Four Rivers Charter Public School 7th grade 2006

ROCK NAME:
Columnar basalt

PARK SECTION:
South Park

ORIGIONAL LOCATION:
Deerfield, Mass

WHAT YOU CAN OBSERVE TO LEARN ABOUT THIS ROCK:

Look for	Gray color Look for tiny crystals Little sparkles (those are the crystals) Spots of lichen Overall rectangular prism shape
Touch and Feel	Jagged edges Rough surfaces Smooth crystals
Look closely at	Grain size, coarse or fine? The sheeny-shinyness of the rock It's glued together so freezing ice doesn't crack it.

Rock Type(s):	**Rocks like this form when:**
Igneous (extrusive)	Lava cools above the surface quickly. The columns are from shrinkage cracks developed as the lava cooled.
How old is this rock?	**What is it made of?**
Mesozoic-era, 200,000,000 years ago	Iron, magnesium, sodium, calcium

ROCKS ARE PIECES OF THE PAST

What can this rock tell us about the geologic history of the Connecticut River Valley?

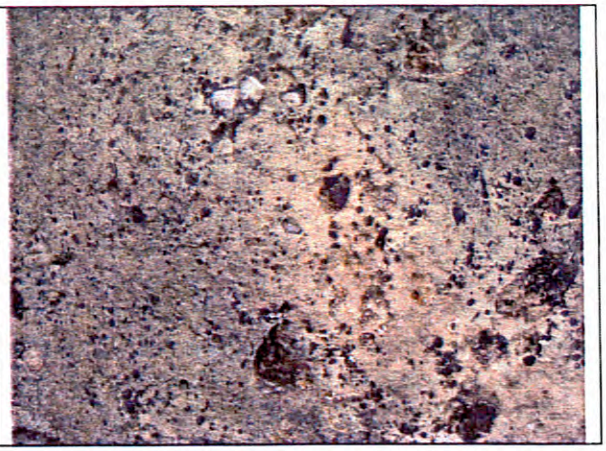
At this time the Eastern Border fault was opening up a rift valley. There was lava coming out of the ground in the Connecticut River valley during the splitting of Pangea. This lava cooled into basalt. That means that rocks from millions of years ago are still here.

The author of this page is: Jeremy Age: 13 From Four Rivers Charter Public School 7th grade 2006

ROCK NAME:
Basalt

PARK SECTION:
South

ORIGIONAL LOCATION:
The Connecticut River Valley



WHAT YOU CAN OBSERVE TO LEARN ABOUT THIS ROCK:

Look for	The rock has minerals in it that have faded into a soft green color. Because it's an Igneous rock, it has air pockets where gas escaped from the rock in its half cooled form. Also on the side facing away from the building it had medium sized white crystals.
Touch and Feel	Notice the rock has a bumpy texture. It feels rough and has an almost waxy feel to it.
Look closely at	If you look closely on the rock, on the side facing away from the building it has medium sized dark crystals. If you look under the rock, you'll see the rock is a rusty red brown color. The medium sized white crystals are calcite.

Rock Type(s):	**Rocks like this form when:**
Igneous (extrusive)	Lava erupts from the surface (from along fissure cracks) and is cooled very quickly.
How old is this rock?	**What is it made of?**
From the Jurassic period, 201,000,000 years ago, during the time Pangaea was pulling apart.	Calcium-sodium feldspars, iron-magnesium silicates, and no quartz.

ROCKS ARE PIECES OF THE PAST

What can this rock tell us about the geologic history of the Connecticut River Valley?

Lava must have flowed to the surface, then cooled at an extrememly fast rate in order for this rock to form. The lava came up through large fissures must of occurred when Pangaea began pulling apart. Hot lava flowed out into a nearby river or lake and cooled quickly in the water.

The author of this page is: Israel Age: 13 From Four Rivers Charter Public School 7th grade 2006

ROCK NAME:
Slickenside

PARK SECTION:
South.

ORIGIONAL LOCATION:
Cheapside Quarry, East Deerfield

WHAT YOU CAN OBSERVE TO LEARN ABOUT THIS ROCK:

Look for	Look for white bumps and shiny, smooth layers that look glassy. This is a SlickenSide. The white bumps are calcite. Why do you think these two minerals are on the same side?
Touch and Feel	Touch and feel how the calcite and shiny surfaces are different in texture. Feel the gray part of the rock. The texture is always a good way to tell that they are different minerals.
Look closely at	Look closely at the shiny surfaces and the Calcite. They are a good thing to look closely at because it tells us how the rock formed. Notice the way the Calcite is on top of the Slicken Side. This happens in really hot temperatures. This is another way to tell how the rock formed.

Rock Type(s):	**Rocks like this form when:**
Igneous (Extrusive) My rock has had a metamorphic process on a side, and has a sedimentary mineral, but the rock itself is Igneous.	When an earthquake slides two rocks (or 2 halves of the same rock in this case) and the time and pressure is so much that shiny surfaces and Calcite form.
How old is this rock?	**What is it made of?**
The Jurassic period. 144-208 MYA	My rock is made of Calcite and Basalt. The Basalt minerals were probably: Feldspar, Pyroxene, Olivine, Biotite, Amphibole, ilmenite, hematite, apatite, and quartz.

ROCKS ARE PIECES OF THE PAST

What can this rock tell us about the geologic history of the Connecticut River Valley?

There was a lava flow. I know this because my rock is extrusive, meaning it was formed on the surface of the earth. I know there was a an earthquake because of the glassy texture and the argular white bumps (Calcite). I also know that Calcite flowed into my rock showing that there must have been really hot temperatures. In the Jurassic period, Pangea is breaking apart which means there was earthquakes and lava flows down at the Eastern Border Fault. Fissure eruptions cause lava to flow through the valley covering it with up to several hundred feet of molten rock.

The author of this page is: Corey Age: 12 From Four Rivers Charter Public School 7th grade 2006

ROCK NAME:
Pillow lava "toes"

PARK SECTION:
South

ORIGIONAL LOCATION:
Cheapside Quarry, East Deerfield

WHAT YOU CAN OBSERVE TO LEARN ABOUT THIS ROCK:

Look for	There are bubbles in some of the rocks. That means they cooled quickly.
Touch and Feel	The rocks are rough in some spots and smooth in others.
Look closely at	When you look closely at the rock you can't see the grains/minerals at all because they're so tiny. Look at all the different colors.

Rock Type(s):	**Rocks like this form when:**
Igneous (extrusive)	Lava cools quickly under water.
How old is this rock?	**What is it made of?**
The time period is the early Jurassic 201-144 million years ago	Plagioclase feldspar, pyroxene, and olivine.

ROCKS ARE PIECES OF THE PAST

What can this rock tell us about the geologic history of the Connecticut River Valley?

There would have been an eruption of lava when Pangea, a supercontinent, broke apart. The lava would then flow into a shallow lake near were the eruption happened and cool quikly under water.

The author of this page is: Ashley Age: 12 From Four Rivers Charter Public School 7th grade 2006

ROCK NAME:
Glacially scratched basalt

PARK SECTION:
South

ORIGIONAL LOCATION:
Cheapside Quarry East Deerfield

WHAT YOU CAN OBSERVE TO LEARN ABOUT THIS ROCK:

Look for	If you are looking at this rock, look for scratches on the flat top of this rock there is one big scratch on it in the shape of a y on the surface of the rock.
Touch and Feel	This rock is relatively smooth on the surface but it has some scratches. On the sides it is rough and bumpy.
Look closely at	If you look real closely at the rock there is a piece on the side that is broken off. If you look closely at it there are some little tiny crystals in it. There is a scratch that is shaped like a y. That scratch was made by a bulldozer when they were cleaning the rock off. If you look real close at the rock you will notice a lot of scratches going a bunch of different ways. Some go side to side others go up and down and some other ones go dangle, these scratches were made by glaciers going up and down and pushing and sliding all sorts of different ways.

Rock Type(s):	**Rocks like this form when:**
This rock is an igneous rock, it is called basalt	This rock is formed by the really hot lava then cooling but not that fast because there is not a lot of little hole from the gases. it would have a lot if there were a lot of bubbles
How old is this rock?	**What is it made of?**
This rock is 200,000,000 years old but the scratches on it are probably about 20,000 years old because that is about the time of the ice age and glaciers.	This rock is made of some crystals and some sort of lava activity. It also has no quartz in it, it has dark color and its grain size is fine. It is an igneous rock called basalt.

ROCKS ARE PIECES OF THE PAST

What can this rock tell us about the geologic history of the Connecticut River Valley?

What this rock can tell us about the geologic hisory of the Connecticut River Vally is that it was near some sort of lava activity and is partly made out of it. I think there was some sort of lava activity because there is some crystals in the rock and it has some holes from the gases and from cooling. There also must have been some glaciers here because of the scraches on it that go a whole bunch of different ways. Some of the scratches were caused by glaciers and some were caused by a bulldozer!

The author of this page is: Cody Age: 13 From Four Rivers Charter Public School 7th grades 2006

Each year, seventh graders at Four Rivers Charter Public School study the geology of the Connecticut River Valley by learning to "read the rocks" and use evidence from our landscape to figure out what forces must have shaped the region in which we live. For the last three years, the rock park at Greenfield Community College has been an essential part of our studies. Once they hiked up to the top of the hill, past the north wing and stepped behind the main building on the GCC campus, students often commented that they "had no idea this was up here." For students of geology, this collection of rock samples from the whole Connecticut River Valley region is as valuable as any library.

There is a wonderful pamphlet guide available for visitors at the rock park, but my students often struggled to find and understand the information that is more geared toward college students and adults. That is when the idea of having my students interpret the park for other kids in their own words was born. In the fall of 2006, I suggested the idea to 36 enthusiastic science students who dove right into the project. With the expert help of Paul Fontaine and Richard Little, they visited the rock park again and again, testing their ideas and interpretations of the rock to which they were assigned. They each revised and reworked their ideas until one side of their rock card was clear and inviting to small children who might want to explore the rock park, and the other side was more detailed for families and older children to learn more about interpreting rocks. Each card is the product of one student's hard work. I am so proud of their scientific work, photography, teamwork, writing and their wonderful product. This is a really cool book guys!

I am grateful to work at a school where we are encouraged to walk out of the classroom and into the community to find ways for our students to make real products for real audiences. We hope you will bring a hand lens, some curiosity and a friend when you come out to the rock park and explore it using our guide. If you would like to give us some feedback on our Kids Guide To The Rock Park, please e-mail us at alocke@fourriverscharter.org.

Amanda
7th grade science and math teacher
Four Rivers Charter Public School

ABOUT THE AUTHORS

Simon
Corey
Sebastien
William
Israel
Daniel
Amelia
Zoë Cavanaugh
Calvin
Crispin Driver
Sawyer Driver
Kai
Meredith
Henri Hardina
Troy Harrington
Kyle
Cody
Martin

Bryan Kernan
Gary
Kevin
Jessica
Ben Lawton
Sam
Alex
Shannon
Brittany
Lucas
Jeremy
Gabrielle
Ashley
Sierra
Carin
Zachary Wallenius
Travis
Jake

This book was made by Four Rivers Charter Public school seventh grade in fall of 2006 when we were studying geology. We are an expeditionary learning school which means we learn by doing projects that serve the community. For more info go to www.fourriverscharter.org.

About the Authors Page author: Kai Front Cover art by Zoë Cavanaugh