TIMPANOGOS CAVE NATIONAL MONUMENT

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Note: The Scratch Lab is a service that our park offers in classrooms. Feel free to contact the monument and set up a time for a Ranger to come and present this lab to and with your students. 80-756-5239 ext 301 and speak with Karissa.

Teacher Example

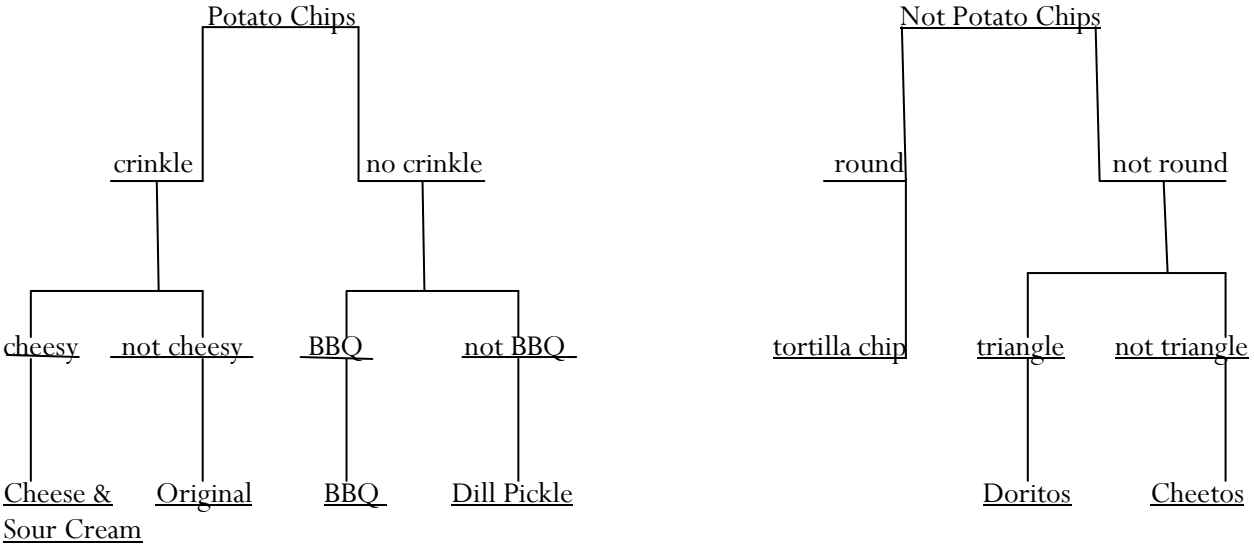
Chip Lab

Rocks are formed by smaller rocks breaking off of larger rock. Rocks are sorted into 3 different types sedimentary, metamorphic, and igneous. Rocks come in many shapes, sizes, colors, particles and textures. Today we will practice sorting chips by what they look like, what they are made of, and what they taste like. This will help us when we sort rocks later.

You will need:
6-8 different kinds of Chips
Worksheet
Pencil

Steps:

1. Wash your hands before we begin
2. Get 1 of each kind of chip
3. Use the worksheet to sort the rest of the chips



Let's make rocks!

There are three different types of rocks sedimentary, metamorphic, and igneous. They are all formed in different ways and create rocks that are made of different materials and look different. Today we will see how each different kind of rock is made.

You will need

- small hot plate or stove
- saucepan
- old crayons
- tub of cold water
- pie tin
- bread
- peanut butter
- jelly
- baggie
- saltwater taffy

Steps

Igneous: When a rock gets really hot, it melts. It turns to a liquid called magma which is found deep inside the earth. When it cools, it forms an igneous rock. Melt crayons in saucepan. This will represent molten rock. Pour some of the crayon into the tub of cool water. Note how fast it hardens into a rock. Pour the rest into the pie tin. Let cool. Later, compare the one that rapidly cooled and the one that cooled slowly.

Sedimentary: Talk about sizes of rocks. Some are very small, but can be compressed into a new layer of rock. Tell the students this can sometimes look like a sandwich of rock. Make a peanut butter and jelly sandwich. You may add other things such as M&Ms or marshmallows to represent a layer of gravel. After adding the top layer of bread, put it into a baggie and pile several heavy books, such as dictionaries or encyclopedias, on top. Emphasize to students that mere layers are not enough to make a sedimentary rock. Those layers must be under extreme pressure for a long time.

Granite

Color: black, white, gray
Hardness: Penny
Texture: Rough
Grain Size: Medium
No Streak or Layers

Igneous
Station 1

Sandstone

Color: Red
Hardness: Nail
Texture: Rough
Layers: Yes
Grain Size: Medium
Steak: No

Sedimentary
Station 1

Obsidian

Color: Black
Hardness: Glass
Texture: Smooth
Streak: White
No Grains or Layers

Igneous
Station 2

Shale

Color: Gray
Hardness: Nail
Texture: Smooth
Layers: Yes
Grain Size: Very Small
Streak: White

Sedimentary
Station 3

Pumice

Color: Light Gray
Hardness: Nail
Texture: Rough
Layers: No
Grain Size: Medium
Streak: White

Igneous
Station 3

Conglomerate

Color: Gray, brown, pink
Hardness: Nail
Texture: Rough
Grain Size: Large
No Layers or Streak

Metamorphic
Station 3

Basalt

Color: Gray
Hardness: Penny
Texture: Rough
Streak: Brown
No Layers or Grains

Igneous
Station 1

Marble

Color: White, Pink, Gray
Hardness: Nail
Texture: Rough
Grain Size: Small
Streak: White
No Layers

Metamorphic
Station 3

Limestone Color: Gray, pink Hardness: Penny Texture: Smooth Layers: Yes Grain Size: Medium Streak: White **Sedimentary** **Station 2**	**Diamond** Color: White/ Brown Hardness: Glass Texture: Smooth Layers: No Crystal Size: Large Streak: White **Igneous** **Station 2**
Schist Color: Gray, White Hardness: Penny Texture: Smooth Layers: Yes Grain Size: Medium Streak: White **Sedimentary** **Station 2**	**Talc** Color: Gray Hardness: Glass Texture: Smooth Streak: White No Grains or Layers **Mineral** **Station 1**
Gneiss Color: Dark Gray Hardness: Penny Texture: Smooth Layers: Yes Grains: Medium No Streak **Metamorphic** **Station 1**	**Graphite** Color: Gray Hardness: Nail Texture: Smooth Layers: Yes Grain Size: Very Small Streak: Gray **Mineral** **Station 3**
Slate Color: Dark Gray Hardness: Penny Texture: Smooth Layers: Yes Grain Size: Very Small Streak: Gray **Metamorphic** **Station**	**Magnetite** Color: Gray, brown, white Hardness: Penny Texture: Rough Layers: No Grain Size: Small Streak: Brown **Mineral** **Station 2**

Pyrite	Quartz
Color: Gold Hardness: Glass Texture: Smooth Streak: Brown, gray No Layers or Grains	Color: White Hardness: Glass Texture: Rough Crystal Size: Large No Layers or Streak
Mineral **Station 2**	**Mineral** **Station 3**

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Scratch Lab Instructions

Introduction: You (the students) have practiced sorting chips into different groups and identifying what they are based on what they look like and taste like. You have also learned about the rock cycle and the different types of rocks. Today we will be looking at rocks and figuring out which rock or mineral they by looking at things like how hard they are, their color, and if they leave a streak.

Materials:

- Scratch Kits (penny, glass plate, streak plates, magnet, small magnifying glasses)
- Rocks and Minerals (List provided on answer key)
- Worksheets

Procedure:

Step 1: Show the students the chart that they will be filling out. Show them what they will be writing in each column (i.e. hardness: glass, penny, nail). Then make sure that they see where to write the name of the rock or mineral (at the bottom of the 2nd page of the worksheet.)

Step 2: Split the students into partnerships and then put the partnerships into groups of 3. There will be 6 rocks at each station.

Step 3: Demonstrate each of the tests to the students, showing the how to identify color, how to test the hardness of each rock by scratching, looking at layers and texture, testing streak with streak plates, and using the magnifying glass to identify grains and crystals.

Step 4: After demonstrating how to test the rocks and fill out the worksheet table show the students the rock and mineral flash cards at each station. These cards will list what features each rock or mineral has and they can match the card with their table to find out what the name of the rock or mineral is.

Step 5: Let students finish the rest of the lab with their partner. Once the entire group is finished with a station have every group rotate to the next table until the students have identified every rock.

Step 6: Go over the answers with the students and discuss the conclusions that the students came to.

Rock Investigators (Master Sheet)

Station 1:

	Color	Hardness	Texture	Layers	Grain/Crystal Size	Streak	Type
#1 Granite	Gray/Black	Penny	Rough	No	Medium	No	Igneous
#2 Sandstone	Red	Nail	Rough	Yes	Small	No	Sedimentary
#3 Talc	Light Gray	Glass	Smooth	No	No	White	Mineral
#4 Basalt	Gray	Penny	Rough	No	No	Brown	Igneous
#5 Gneiss	Black and White	Nail	Rough	Yes	Medium	No	Metamorphic
#6 Slate	Dark Gray	Penny	Smooth	Yes	No	Gray	Metamorphic

Station 2:

	Color	Hardness	Texture	Layers	Grain/Crystal Size	Streak	Type
#7 Diamond	White/Brown	Glass	Smooth	No	Large	None	Igneous
#8 Schist	Gray/White	Penny	Rough	Yes	Small	White	Metamorphic
#9 Limestone	Pink/Gray/ White	Penny	Smooth	Yes	Medium	White	Sedimentary
#10 Pyrite	Gold	Glass	Smooth	None	None	Brown/ Gray	Mineral
#11 Obsidian	Black	Glass	Smooth	None	None	White	Igneous
#12 Magnetite	Gary/Brown/ White	Penny	Rough	None	Small	Brown	Mineral

Station 3:

	Color	Hardness	Texture	Layers	Grain/Crystal Size	Streak	Type
#13 Quartz	White	Glass	Rough	None	Large	None	Mineral
#14 Pumice	Light Gray	Nail	Rough	None	Medium	White	Igneous
#15 Conglomerate	Orange/Red/ Brown/Gray	Nail	Rough	None	Large	None	Metamorphic
#16 Shale	Gray	Nail	Smooth	Yes	Small	White	Sedimentary
#17 Marble	White	Nail	Rough	None	Small	White	Metamorphic
#18 Graphite	Dark Gray	Nail	Smooth	Yes	Small	Gray	Mineral

What is it?

#1 Granite

#2 Sandstone

#3 Talc

#4 Basalt

#5 Gneiss

#6 Slate

#7 Diamond

#8 Schist

#9 Limestone

#10 Pyrite

#11 Obsidian

#12 Magnetite

#13 Quartz

#14 Pumice

#15 Conglomerate

#16 Shale

#17 Marble

#18 Graphite

Name _____ Date _____

Rock Investigators

Station 1:

	Color	Hardness	Texture	Layers	Grain/Crystal Size	Streak	Type
#1							
#2							
#3							
#4							
#5							
#6							

Station 2:

	Color	Hardness	Texture	Layers	Grain/Crystal Size	Streak	Type
#7							
#8							
#9							
#10							
#11							
#12							

Station 3:

	Color	Hardness	Texture	Layers	Grain/Crystal Size	Streak	Type
#13							
#14							
#15							
#16							
#17							
#18							

What is it?

#1_____

#2_____

#3_____

#4_____

#5_____

#6_____

#7_____

#8_____

#9_____

#10_____

#11_____

#12_____

#13_____

#14 _____

#15_____

#16_____

#17_____

#18_____

Name _____ Date _____

Chip Lab

_____ _____ _____ _____ _____ _____ _____ _____ _____ _____ _____ _____ _____ _____ _____ _____ _____ _____ _____ _____