

Rocks and Minerals Scavenger Hunt

Welcome to your online scavenger hunt! This scavenger hunt is going to introduce us to terms that we are going to learn more about throughout this unit. The following websites are going to help you along your way to the answers. Enjoy your scavenger hunt!

<http://www.ducksters.com/science/rocks.php>

1. What is a rock?

2. What are the names of the three different types of rocks?

http://www.ducksters.com/science/earth_science/minerals.php

3. What is a mineral?

<http://kidsgeo.com/geology-for-kids/0026-igneous-rocks.php>

(look at the left side of the website for the names of the rocks)

4. How are igneous rocks formed?



5. How are sedimentary rocks formed?

6. How are metamorphic rocks formed?

<http://www.mineralogy4kids.org/>

Click on Mineral Properties image and choose 5 physical properties listed on the right side

7. What are 5 physical properties of minerals?

- a. _____
- b. _____
- c. _____
- d. _____
- e. _____

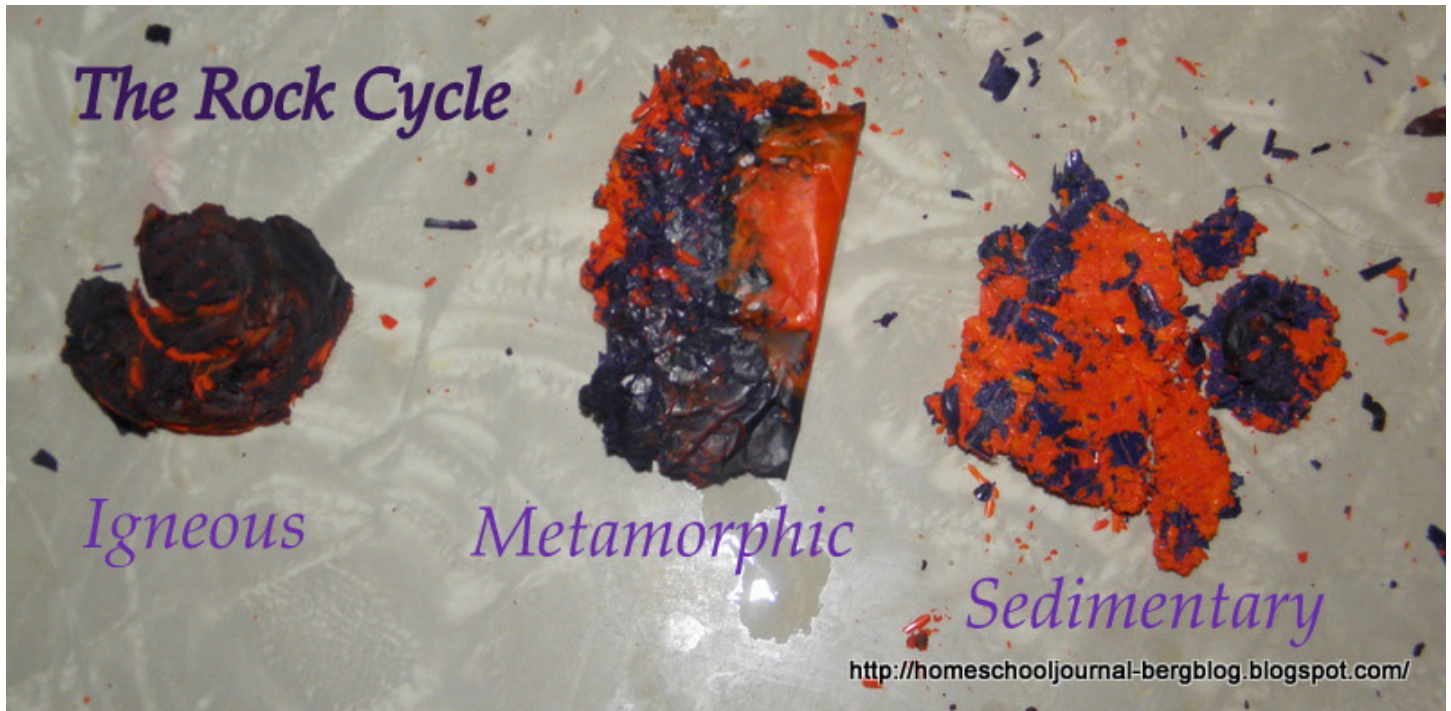
Read about the physical properties of a mineral and choose one

8. What is something you found interesting about this physical property?



Lesson Two - Teacher Directions for Completing

**challenge your students and read them the instructions without telling the students the names of the rocks.
Check their knowledge at the end of the challenge.



Igneous rocks are formed deep within the Earth and are formed by heat. Move the iron just a little close to the crayon shavings. They slowly start to melt. Discuss how they form crystals that are either long, coarse grains or short, fine grains based on the length of time it takes.

Sedimentary rocks. Cut a small piece of the wax paper and place it over the top of the second pile of crayon shavings. Add the textbook to the top and apply lots of pressure. Take the book off and see what happened to the crayon wax. Show students the results and together, discuss just how it would look after years, and years of even more pressure.

Metamorphic rock. Take the third pile and place a piece of wax paper over it. Then apply the iron down on the wax paper – applying both pressure and heat. Just a quick 10 seconds or so does the trick. Discuss what happened.



Teacher Resources about Indigenous Perspectives on Mining:

Activity for resources- read out loud and listen to the different perspectives, class decides together if this information would be considered a “pro” or “con” for the community

1. <http://www.abc.net.au/radio/programs/pm/indigenous-groups-debate-pros-and-cons-of-mining/4242958>
Pros and Cons of mining- Indigenous groups debate pros and cons of mining- PM- ABC Radio
-talks about lands, communities- money, job opportunities= perspectives from both sides (4:47 long)

2. <http://caid.ca/JAICH2005v3n1p115.pdf>
Canada’s Resilient North: The Impact of Mining on Aboriginal Communities
Pimatisiwin: A Journal of Aboriginal and Indigenous Community Health by University of British Columbia and University of Alberta

-teachers could look at subheadings and skim for important information to lead their class in a discussion

3. <http://beta.fpic.info/en/about/>
Free Prior and Informed Consent (FPIC) is the inherent right Indigenous communities have to decide “yes” or “no” to mining, forestry, oil, gas, water, or other proposed external activities that would affect their lands, territories, and/or natural resources.

-teachers could search this website for resources that they want to share with their class about different Indigenous groups around the world and different extractions that effect their communities.

4. <https://miningwatch.ca/news/2017/10/27/canada-has-second-worst-mining-record-world-un>

MiningWatch Canada is a pan-Canadian initiative supported by environmental, social justice, Indigenous and labour organizations from across the country. It addresses the urgent need for a coordinated public interest response to the threats to public health, water and air quality, fish and wildlife habitat, and community interests posed by irresponsible mineral policies and practices in Canada and around the world.

Article: Canada Has Second-Worst Mining Record in World: UN

-article focuses on tailings spills



Lesson 3

Definitions and Testing Stations

Colour:

Often you can identify a mineral by its colour. Some rocks have multiple colours, it is up to the student to decide what colour the rock is. The student can look at a rock and mineral book as a reference if they need to compare.

Streak:

This is a test that can help identify minerals by examining the colour of the streak when a mineral is rubbed across a flat surface.

Students will:

1. Rub the mineral across the back of an unglazed/ porcelain tile
2. Examine the colour of the streak under sunlight
3. If the mineral is harder than the tile and leaves no streak, carefully scratch the mineral with a nail
4. Look at the streak or scratch and agree on a colour
5. Record findings

Hardness: (The Scratch Test)

The hardness scale was established by the German mineralogist, Friedrich Mohs. The Mohs' hardness scale places ten common or well-known minerals on a scale from one to ten. One is the softest mineral and ten is the hardest.

Here are some common objects and their hardness values:

Common Objects and Their Hardness Values

1	2	3	4	5	7	8-10
Finger	Fingernail	Penny	Butter knife	Steel Nail	Glass	Not effected by scratch test

If an unknown sample cannot be scratched by your fingernail (2) but it can be scratched by a penny (3), then it's hardness is between 2 and 3. The hardness of this mineral would be 2.5.

Find out how hard your rock is by testing it and see where it falls on the hardness scale. Record your answer on your lab sheet.



Lustre

Another mineral property that geologists use to identify minerals is luster. Luster is the way in which the surface of a mineral reflects light.

There are two main types of luster: **metallic and nonmetallic**. A metallic luster is shiny and similar to the reflection from a metal object, such as a faucet. A mineral that does not shine like metal has a nonmetallic luster.

Examples:

The wall has a nonmetallic luster.

A glassy luster is bright and reflects light like a piece of glass.

A greasy luster has an oily appearance.

An earthy luster is a very dull and looks like dirt.

Waxy luster looks like the shininess of a crayon.

Transparency:

The degree of transparency is the ability of the mineral to allow light to pass through it. This may also depend on the thickness of the mineral. Students can use a lamp at this station to test the transparency of their rocks.

Record findings on lab sheet.

Depending on a number of things, rocks & minerals can also transmit light. Many rocks that are opaque when in a chunk, are translucent when cut into very thin slices.

Acid Test:

Pour some vinegar into a bowl. Drop rock samples into the vinegar. If gas bubbles form, then the rock contains minerals called carbonates (such as calcite).

Alternatively, you can put a few drops of vinegar on each rock sample. Watch them carefully to see if there is a reaction. Chalk, marble and limestone make vinegar fizz.

Magnetism

Hold a small magnet next to your mineral. Is the mineral magnetic? Try different rocks and keep notes.

Lab Sheet

Name: _____ Date: _____

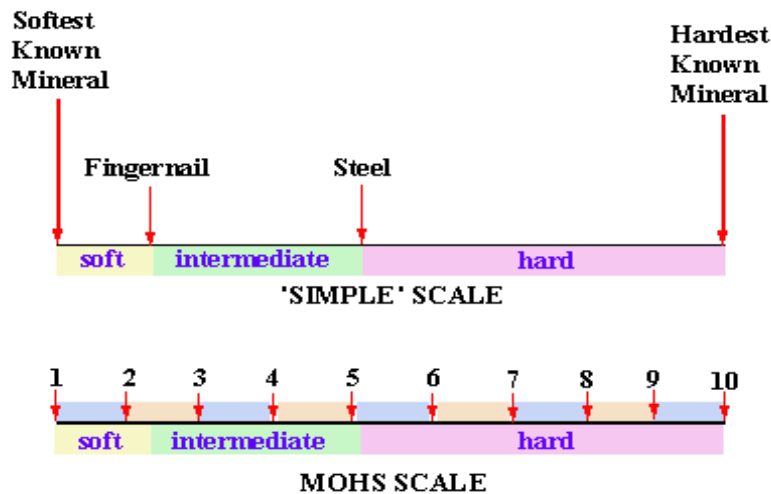
Test 1: Colour

Look at each rock carefully. Look at the colour, the crystals and any other features that you see. Draw your rock as detailed as you can below. There is a textbook provided to help decide on what colour your rock is.

Test 2: Streak

At this station you will find an unglazed porcelain tile. You will take each rock and scratch your rock on the piece of tile. Record the colour of the streak mark and draw a picture of it below.

Test 3: Hardness



Below are the minerals that Mohs used to determine his hardness scale:

Talc	1	Orthoclase (Feldspar)	6
Gypsum	2	Quartz	7
Calcite	3	Topaz	8
Fluorite	4	Corundum	9
Aptite	5	Diamond	10

Find out how hard your rock is by trying these tests below.

If your rock...	Give it a hardness number...
Can be rubbed off on your fingers	1
Can be scratched with a fingernail	2
Can be scratched with a penny	3
Can be scratched easily with a butter knife	4
Is too hard to scratch with a butter knife	5
Can be scratched with a steel nail but not glass	6
Can be used to scratch glass	7
Too hard to be tested in this scale	8-10

Scale number: _____

Which mineral from Mohs scale does your rock match up with the most? Look at the chart above.

Test 4: Lustre

Place your rock under the lamp and describe what you see. What does your rock look like? Does it reflect the light? There are examples provided if you need some ideas.

Test 5: Transparency

Place your rock under the lamp. Can you see light coming through the rock? Is your rock transparent or opaque? Record your findings below.

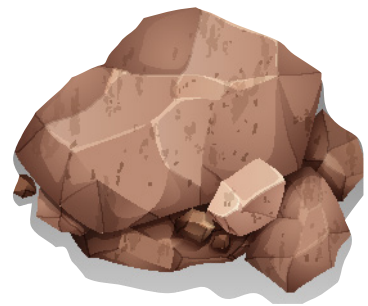


Test 6: Acid (Vinegar)

Put your rock in the bowl of vinegar. Let it sit for a while and watch carefully. Describe what happened below.

Test 7: Magnetism

There is a magnet at this station. You are to use the magnet to test if your rock contains magnetic materials. Describe what happened below.





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The Hunting of the Great Bear

This particular story is definitely a Haudenosaunee legend, as one can tell from the name [Nyah-gwaheh](#), which means "Great Bear" in Cayuga.

There were four hunters who were brothers. No hunters were as good as they at following a trail. They never gave up once they began tracking their quarry.

One day, in the moon when the cold nights return, an urgent message came to the village of the four hunters. A great bear, one so large and powerful that many thought it must be some kind of monster, had appeared. The people of the village whose hunting grounds the monster had invaded were afraid. The children no longer went out to play in the woods. The long houses of the village were guarded each night by men with weapons who stood by the entrances. Each morning, when the people went outside, they found the huge tracks of the bear in the midst of their village. They knew that soon it would become even more bold.

Picking up their spears and calling to their small dog, the four hunters set forth for that village, which was not far away. As they came closer they noticed how quiet the woods were. There were no signs of rabbits or deer and even the birds were silent. On a great pine tree they found the scars where the great bear had reared up on hind legs and made deep scratches to mark its territory. The tallest of the brothers tried to touch the highest of the scratch marks with the tip of his spear. "It is as the people feared," the first brother said. "This one we are to hunt is Nyah-gwaheh, a monster bear."

"But what about the magic that the Nyah-gwaheh has?" said the second brother.

The first brother shook his head. "That magic will do it no good if we find its track."

"That's so," said the third brother. "I have always heard that from the old people. Those creatures can only chase a hunter who has not yet found its trail. When you find the track of the Nyah-gwaheh and begin to chase it, then it must run from you."

"Brothers," said the fourth hunter who was the fattest and laziest, "did we bring along enough food to eat? It may take a long time to catch this big bear. I'm feeling hungry."

Before long, the four hunters and their small dog reached the village. It was a sad sight to see. There was no fire burning in the centre of the village and the doors of all the long houses were closed. Grim men stood on guard with clubs and spears and there was no game hung from the racks or skins stretched for tanning. The people looked hungry.

The elder sachem of the village came out and the tallest of the four hunters spoke to him.

"Uncle," the hunter said, "we have come to help you get rid of the monster."

Then the fattest and laziest of the four brothers spoke. "Uncle," he said, "is there some food we can eat? Can we find a place to rest before we start chasing this big bear? I'm tired."



The first hunter shook his head and smiled. “My brother is only joking, Uncle,” he said. “We are going now to pick up the monster bear’s trail.”

“I am not sure you can do that, Nephews,” the elder sachem said. “Though we find tracks closer and closer to the doors of our lodges each morning, whenever we try to follow those tracks they disappear.”

The second hunter knelt down and patted the head of their small dog. “Uncle,” he said, that is because they do not have a dog such as ours.” He pointed to the two black circles above the eyes of the small dog. “Four-Eyes can see any tracks, even those many days old.”

“May Creator’s protection be with you,” said the elder sachem.

“Do not worry. Uncle,” said the third hunter. “Once we are on a trail we never stop following until we’ve finished our hunt.” “That’s why I think we should have something to eat first,” said the fourth hunter, but his brothers did not listen. They nodded to the elder sachem and began to leave. Sighing, the fattest and laziest of the brothers lifted up his long spear and trudged after them.

They walked, following their little dog. It kept lifting up its head, as if to look around with its four eyes. The trail was not easy to find.

“Brothers,” the fattest and laziest hunter complained, “don’t you think we should rest. We’ve been walking a long time.” But his brothers paid no attention to him. Though they could see no tracks, they could feel the presence of the Nyah-gwaheh. They knew that if they did not soon find its trail, it would make its way behind them. Then they would be the hunted ones.

The fattest and laziest brother took out his pemmican pouch. At least he could eat while they walked along. He opened the pouch and shook out the food he had prepared so carefully by pounding together strips of meat and berries with maple sugar and then drying them in the sun. But instead of pemmican, pale squirming things fell out into his hands. The magic of the Nyah-gwaheh had changed the food into worms.

“Brothers,” the fattest and laziest of the hunters shouted, “let’s hurry up and catch that big bear! Look what it did to my pemmican. Now I’m getting angry.”

Meanwhile, like a pale giant shadow, the Nyah-gwaheh was moving through the trees close to the hunters. Its mouth was open as it watched them and its huge teeth shone, its eyes flashed red. Soon it would be behind them and on their trail.

Just then, though, the little dog lifted its head and yelped. “Eh-heh!” the first brother called.

“Four-Eyes has found the trail,” shouted the second brother.

“We have the track of the Nyah-gwaheh,” said the third brother.



“Big Bear,” the fattest and laziest one yelled, “we are after you, now!”

Fear filled the heart of the great bear for the first time and it began to run. As it broke from the cover of the pines, the four hunters saw it, a gigantic white shape, so pale as to appear almost naked. With loud hunting cries, they began to run after it. The great bear’s strides were long and it ran more swiftly than a deer. The four hunters and their little dog were swift also though and they did not fall behind. The trail led through the swamps and the thickets. It was easy to read, for the bear pushed everything aside as it ran, even knocking down big trees. On and on they ran, over hills and through valleys. They came to the slope of a mountain and followed the trail higher and higher, every now and then catching a glimpse of their quarry over the next rise.

Now though the lazy hunter was getting tired of running. He pretended to fall and twist his ankle.

“Brothers,” he called, “I have sprained my ankle. You must carry me.”

So his three brothers did as he asked, two of them carrying him by turns while the third hunter carried his spear. They ran more slowly now because of their heavy load, but they were not falling any further behind. The day had turned now into night, yet they could still see the white shape of the great bear ahead of them. They were at the top of the mountain now and the ground beneath them was very dark as they ran across it. The bear was tiring, but so were they. It was not easy to carry their fat and lazy brother. The little dog, Four-Eyes, was close behind the great bear, nipping at its tail as it ran.

“Brothers,” said the fattest and laziest one, “put me down now. I think my leg has gotten better.”

The brothers did as he asked. Fresh and rested, the fattest and laziest one grabbed his spear and dashed ahead of the others. Just as the great bear turned to bite at the little dog, the fattest and laziest hunter levelled his spear and thrust it into the heart of the Nyah-Gwaheh. The monster bear fell dead.

By the time the other brothers caught up, the fattest and laziest hunter had already built a fire and was cutting up the big bear.

“Come on, brothers,” he said. “Let’s eat. All this running has made me hungry!”

So they cooked the meat of the great bear and its fat sizzled as it dripped from their fire. They ate until even the fattest and laziest one was satisfied and leaned back in contentment. Just then, though, the first hunter looked down at his feet.

“Brothers,” he exclaimed, “look below us!”

The four hunters looked down. Below them were thousands of small sparkling lights in the darkness which, they realized, was all around them.



“We aren’t on a mountain top at all,” said the third brother. “We are up in the sky.” And it was so. The great bear had indeed been magical. Its feet had taken it high above the earth as it tried to escape the four hunters. However, their determination not to give up the chase had carried them up that strange trail.

Just then their little dog yipped twice.

“The great bear!” said the second hunter. “Look!”

The hunters looked. There, where they had piled the bones of their feast the Great Bear was coming back to life and rising to its feet. As they watched, it began to run again, the small dog close on its heels.

“Follow me,” shouted the first brother. Grabbing up their spears, the four hunters again began to chase the great bear across the skies.

So it was, the old people say, and so it still is. Each autumn the hunters chase the great bear across the skies and kill it. Then, as they cut it up for their meal, the blood falls down from the heavens and colours the leaves of the maple trees scarlet. They cook the bear and the fat dripping from their fires turns the grass white.

If you look carefully into the skies as the seasons change, you can read that story. The great bear is the square shape some call the bowl of the Big Dipper. The hunters and their small dog (which you can just barely see) are close behind, the dipper’s handle. When autumn comes and that constellation turns upside down, the old people say. “Ah, the lazy hunter has killed the bear.” But as the moons pass and the sky moves once more towards spring, the bear slowly rises back on its feet and the chase begins again.



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Lesson Four- Cultural Connections

Resource Books to engage students:

The Enormous Rock (Adams, 2009)

Skipping Rocks (Adams, Skipping Rocks, 2009)

Website Resources Students can use:

Rock Cycle- Rocks

https://www.msnucleus.org/membership/html/k-6/rc/rocks/4/rcr4_3a.html

Rockology

<https://www.rockology.net/10-rocks-and-minerals-of-the-american-indians/>

The Office of State Archaeologist

<https://archaeology.uiowa.edu/ground-stone-artifacts-0>

Stone Tools

<https://www.warpaths2peacepipes.com/native-indian-weapons-tools/stone-tools.htm>

Native American Tools

<https://www.warpaths2peacepipes.com/native-indian-weapons-tools/native-american-tools.htm>

Native American Indian Rock Art

<http://www.artsology.com/rockart.php>

Rock Art

<https://www.warpaths2peacepipes.com/native-indian-art/rock-art.htm>

Beads

<http://indians.org/articles/beads.html>

Native American Rings

<http://indians.org/articles/native-american-rings.html>

Native American Jewelry Facts

<https://www.warpaths2peacepipes.com/native-american-clothing/native-american-jewelry.htm>

Native American Indian Facts- Jewelry

<http://native-american-indian-facts.com/Native-American-Indian-Art-Facts/Native-American-Indian-Jewelry-Facts.html>



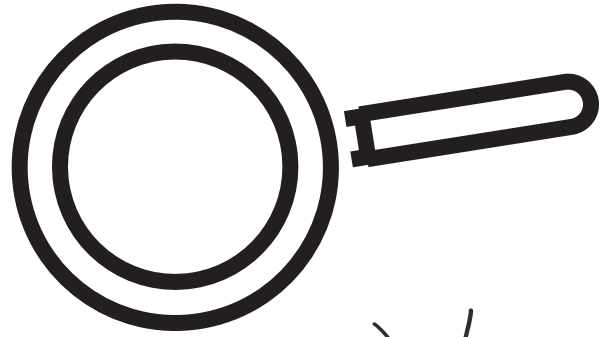
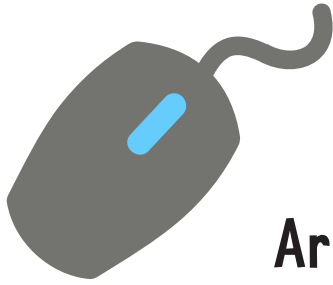
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Pros of Mining

Cons of Mining

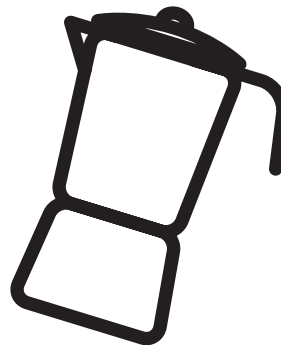
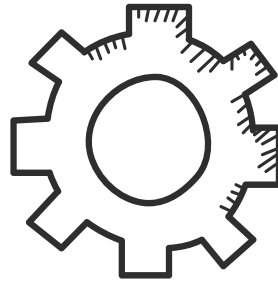


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Are these items made from rocks
and minerals?

bricks
tiles
cement
nuts
bolts
nails
screws
windows
cutlery
drinking glasses
pots
pans
salt
cans
animals
cleaning supplies
light bulbs



batteries
cars
airplanes
computers
IPads
laundry soap
toothpaste
trees
thermometers
kitchen counters
plaster cast
sidewalk chalk
pens
pencils
paint
plants
cell phone





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Rocks and Minerals

NOT Rocks and Minerals