

ROCKS, GEMS, AND MINERALS



A RMSEL FIELD GUIDE

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ROCKY MOUNTAIN SCHOOL OF EXPEDITIONARY LEARNING
2016-2017

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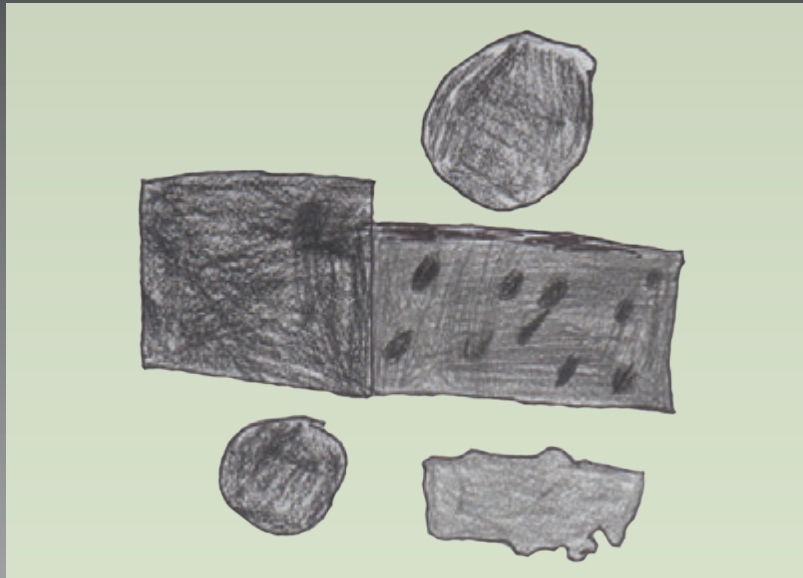
INTRODUCTION

This year David's crew is studying rocks and minerals in the fall. Each student made a rock field guide for the rocky mountains. They have gone on rocking crew trips and found fossils and rocks. David's crew has been to a library to learn more about their rocks. They have put a lot of effort to finish them. They made lots of drafts of water colors of their rocks. Each student worked really hard to study and write about there rock so when you read or look at a rock please note how hard they worked to tell you and show you about there rock.

IGNEOUS ROCKS



BASALT



Basalt is a type of rock that is used for the pavement at Rmsel. And other places.

What is dark color on rock? What is a hot heavy rock made of lava? Basalt! Basalt is the most common rock on the planet. Basalt is made of hot heavy lava that quickly cools, it forms basalt. Basalt can be on a road and at Rmsel for the pavement. Basalt is a hot heavy rock it is black and other dark colors. Basalt can be

Very hot and very brown. Basalt can be found in almost the entire planet. Basalt can be found in the western United States. The western United States has quite a bit of both types. Basalt can also be found in the Rocky Mountains. Basalt is as dark as the darkest thing on Earth. Basalt is amazing. Basalt has quite a bit of darkness on its color.

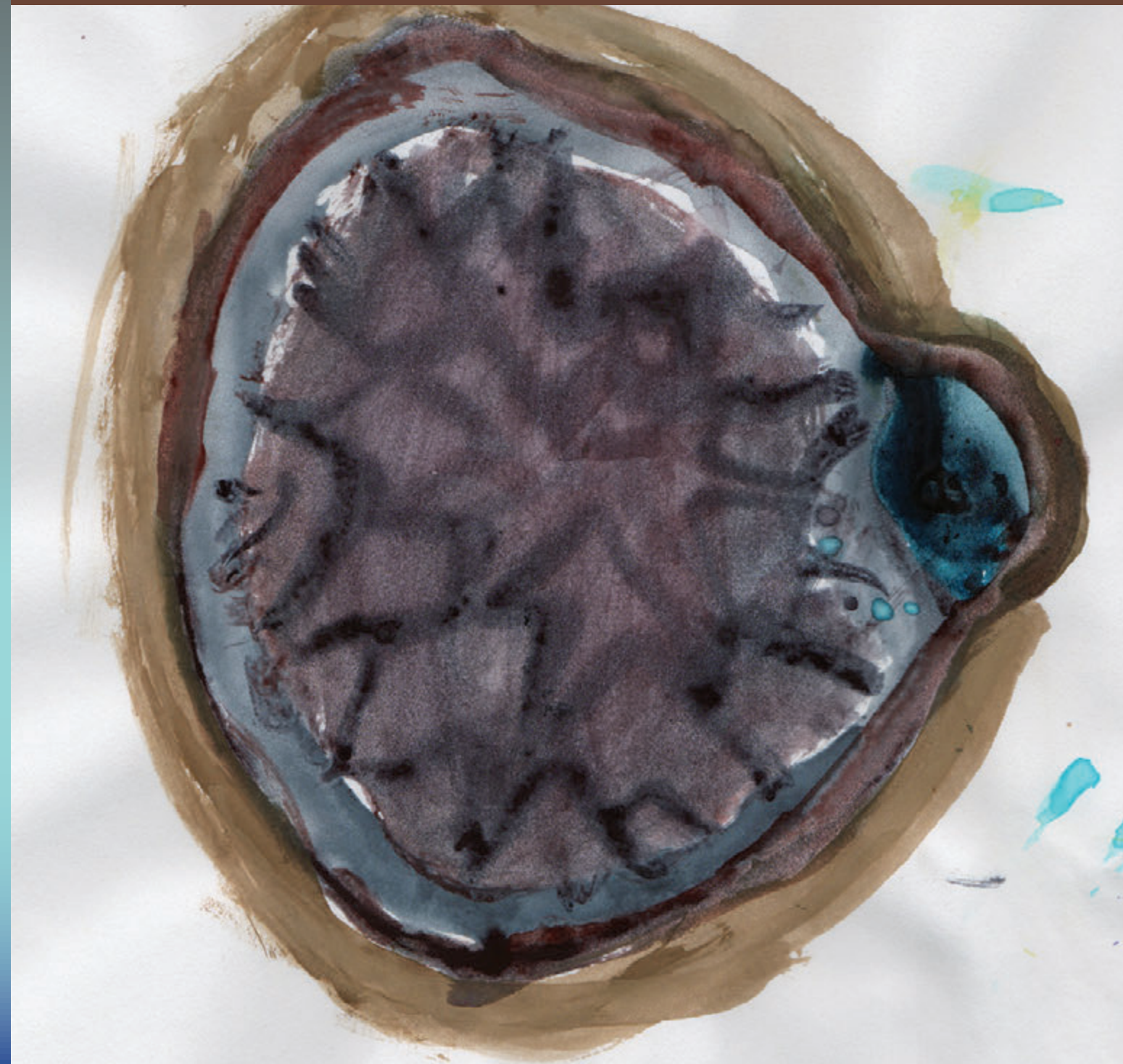


GEODES



Try it!
Go to the
state look for
shops. You can
buy a geode and
they will break it
open if you have
luck you might get
a crystal!

Gorgeous Geodes!! Geodes
are sometimes found in limestone.
Bands form agate as minerals and other
impurities seep into the water-filled cavities
inside igneous rocks. The result is a huge range
of colors forming interesting patterns across
the gem. Geodes are an igneous rock.
The color is white, yellow, gray, brown blue,
red; banded. Hardness is 6.5-7. Streak is
white. There are so many G words
to describe Geodes like gorges, good and
great I hope you learned something from
this field guide see you next year!



GRANITE



Facts about Granite
Did you know
that Granite
contains lots
of things including
Gold, Quartz, and
Mica. During the
gold rush, people
mined for Granite

Is your brain so full of Granite facts it could POP! Mine is! Here's some facts. Granite is formed deep under Earth's crust in large chambers of molten magma called batholiths. The magma cools very slowly and makes Granite. Granite is a hard, rough, and bumpy rock, it usually has moss or grass on it. Granite can be found by lakes and ponds, and if you're lucky, you can see Mount Rushmore (which is made out of Granite). Now that you know about Granite, you can go see some by lakes, and if you look at Granite under a magnifying glass or a microscope it looks really awesome



OBSIDIAN



did you know
Native American
used to use
Obsidian for spears
and knives and they
still do it to this
day

Obsidian is formed when magma and hot molten rock found deep inside Earth, it cools and hardens into rock. Obsidian is found along the edge of a lava flow and volcanoes. Obsidian is very sharp and smooth, it is pitch black and an igneous rock, and if you go to Hawaii and go to a volcano and see it for your self



SULPHUR



You can find sulphur somewhere by or not by the volcanoes it will be smelly too. Goodbye!

Sulphur is often found close to volcanoes because it is made out of lava when the volcanoes exploded and the sulphur is on or in the rock. I think it has a honey or mustard yellow color because it is what I think I think it is found by the volcanoes or somewhere else and not by the volcanoes and when you find sulphur it is smelly like rotten egg. I like sulphur even though it smells like rotten egg.





METAMORPHIC
ROCKS

AMETHYST



Amethyst can also be a kind of blue green or even translucent.

What is shiny, pointy, rough, found in geodes, and quartz? Amethyst of course. Amethyst got its color from small amounts of iron and manganese mineral. Amethyst is a kind of quartz. Amethyst is very very shiny, it is purple, and a beautiful mineral. Amethyst, is mainly found in geodes like tiger's eye. I like Amethyst myself I would say if you like Amethyst look in geodes for the beautiful purple of Amethyst!



GREENSTONE



Did you know
greenstone
can also be
found on beach
es between
Tofte Grand
marais on the
Coo Lake
county line?

What is shiny, smooth, green, and a beautiful rock? Greenstone of course! Greenstone is a metamorphic rock containing actinolite, epidote, and albite. Greenstones are formed metamorphism of basic igneous rocks. Different types of greenstone are found in different places such as south island of New Zealand, northern Minnesota, Michigan, and lots more. So if you want greenstone look in one of these places!



MICA

Mica alone | Mica with Granite



It is easy to find Mica on another rock. Mica is a metamorphic rock.

Hey Mica lovers! Mica is as reflective as a mirror or a diamond earring. You can find it on the street or on a dirt road. Mica is silver, white and sparkely. It is still under scientific study for how it is formed. Maybe you should go on the street or go to mountains and look for even bigger pieces of mica.

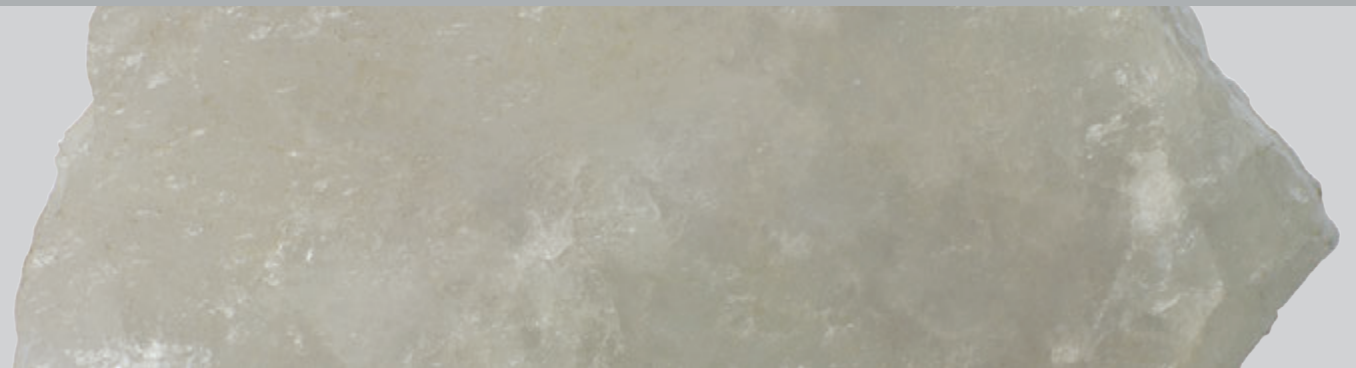
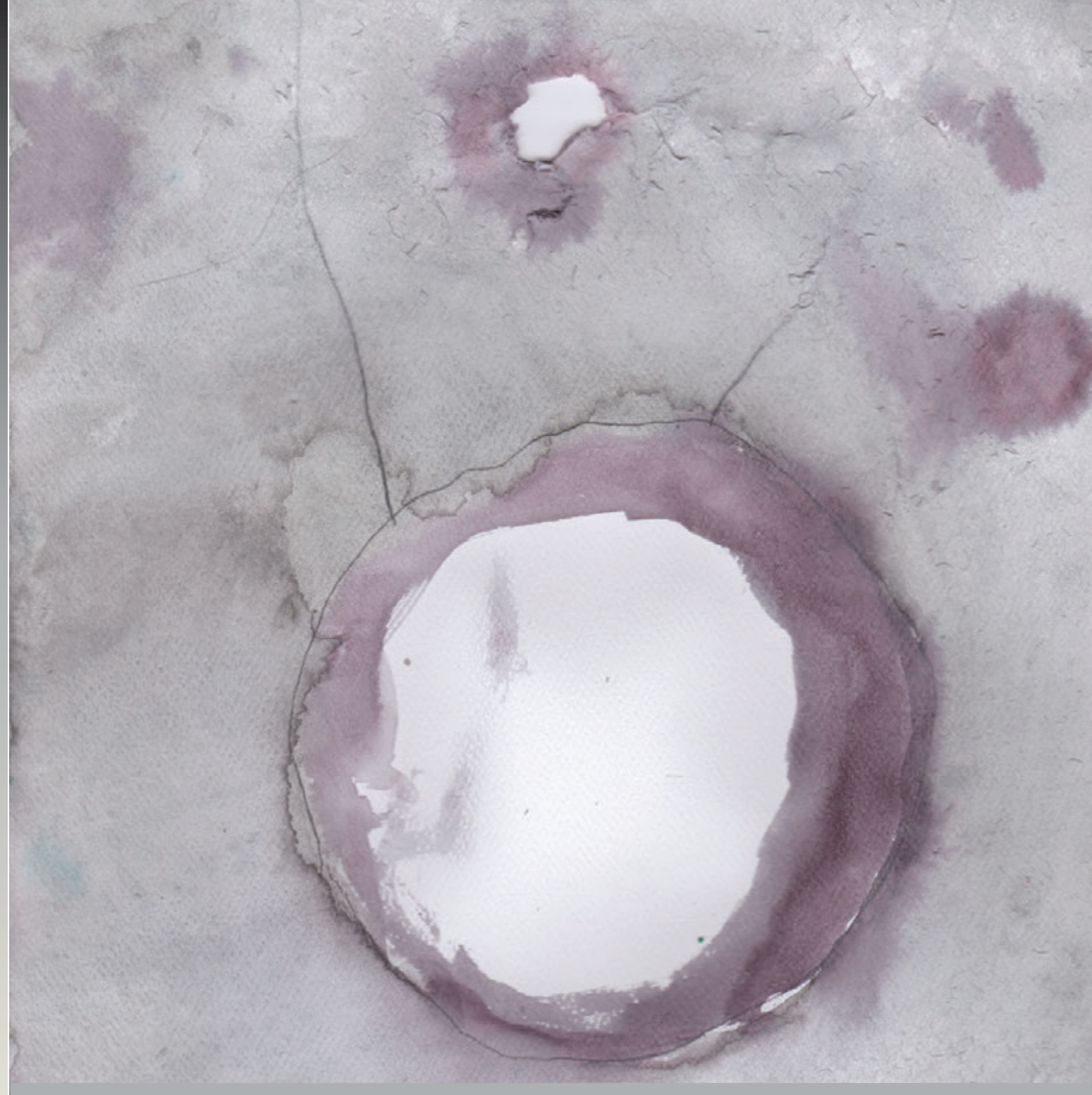


MILKY QUARTZ

Milky quartz
Cdn be
found in
BRAZIL. If
you live in
BRIL you
can find it
to ve if not.
ASK EARLY P. 2000



Milky quartz is a
crystal. It forms through
heat and pressure. The
heat and pressure make the quartz
out of rock. The sides are, feel
like a butter knife. It can look
and feel like a piece of white
ice. It can be smooth and hard.
The top can be very sharp.
If you are interested in
milky quartz. Perhaps you
might want to find a piece
to touch and feel like a kernel of popcorn.



ROSE QUARTZ



Did you know
Rose quartz
is the love
of the earth
Some people
make
polished
rose quartz.
It is cool!!

Take one part of silicore and two
quarts of oxygen. That is how rose
quartz is formed. Rose quartz looks like glass
but it is harder. It is massive or it is
small. All quartz are colorful. It is
pink. It is rough. Rose quartz is found in
massive Colorado granite. It can be
found in Colorado. Rose quartz is like
the pink rose.

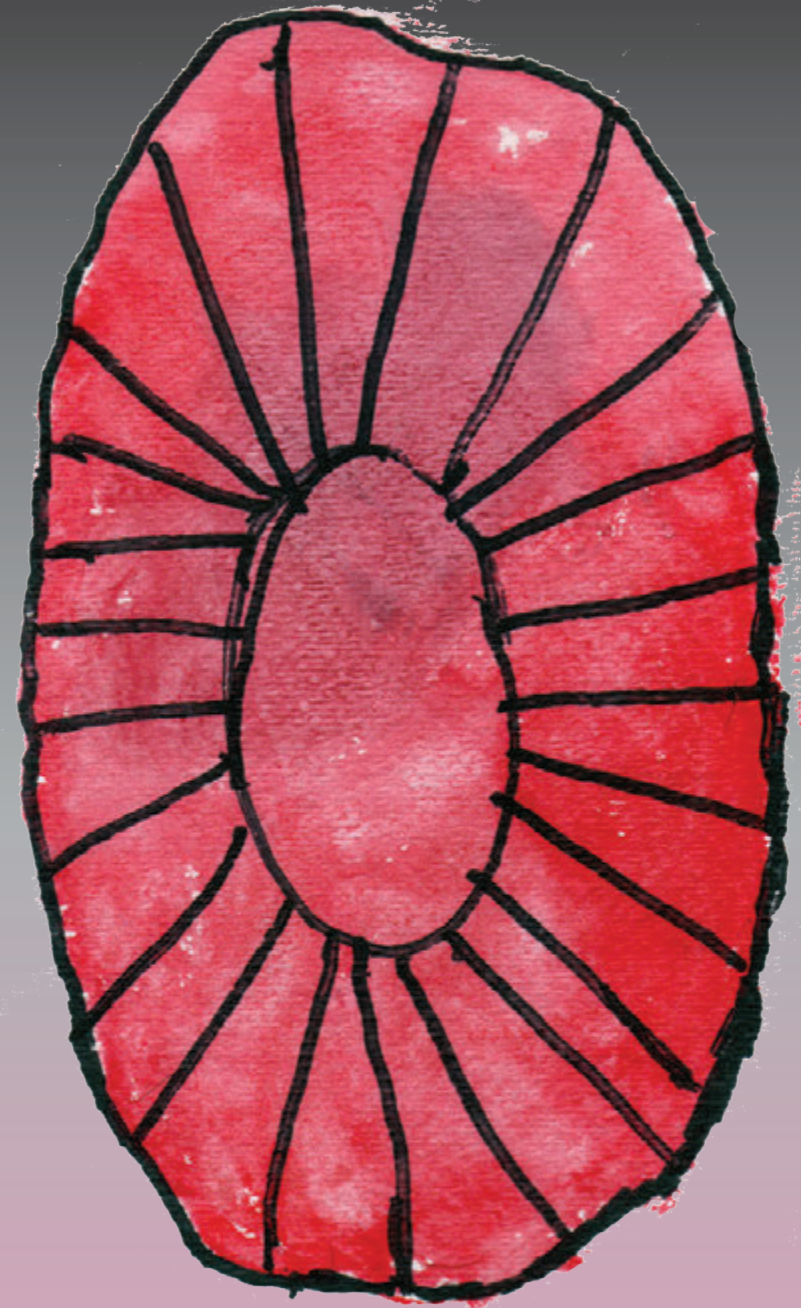


RUBY



There are two kinds of ruby. Raw ruby and ruby. Raw ruby is flat, ruby is bumpy.

It's the King of Precious Stones! Do you know what it is? It's ruby! Formed in igneous and metamorphic rock because of its hardness and density it takes a long time for a ruby to form. Ruby also occurs in river gravels. Reddish pink. They were found alongside topaz and moonstone minerals that are also igneous. Ruby is awesome! Ruby yah!



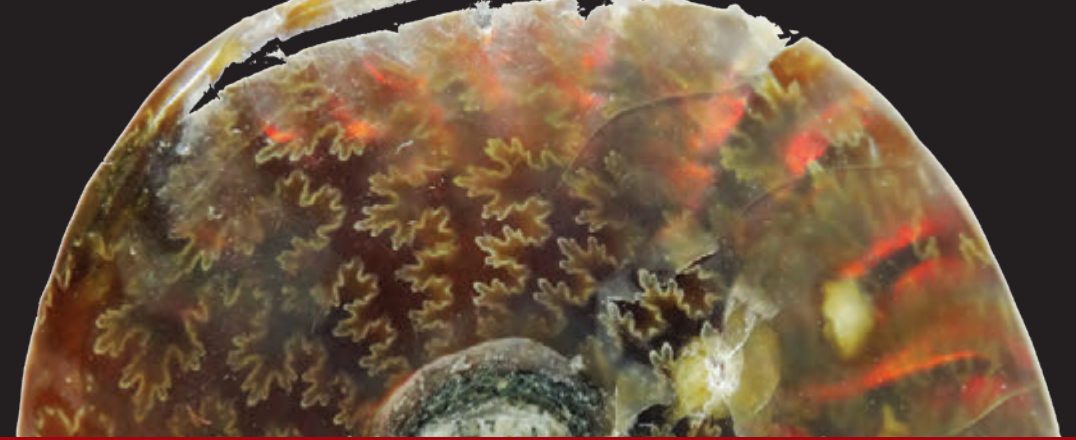


SEDIMENTARY
ROCKS

AMMOLITE



Did you know
that Ammolite
could be
dragon skin!



Did you know that
Ammolite could be dragon
skin? It is so
shiny? It would hurt
my eyes when the
light gets on Ammolite.
The sun reflects on
Ammolite. it gets
shiny you can find
it in the park
mountains I mean
you can find a lot of
this rock there. If you
are interested in this
rock maybe you will
look for it in the rock
mountain

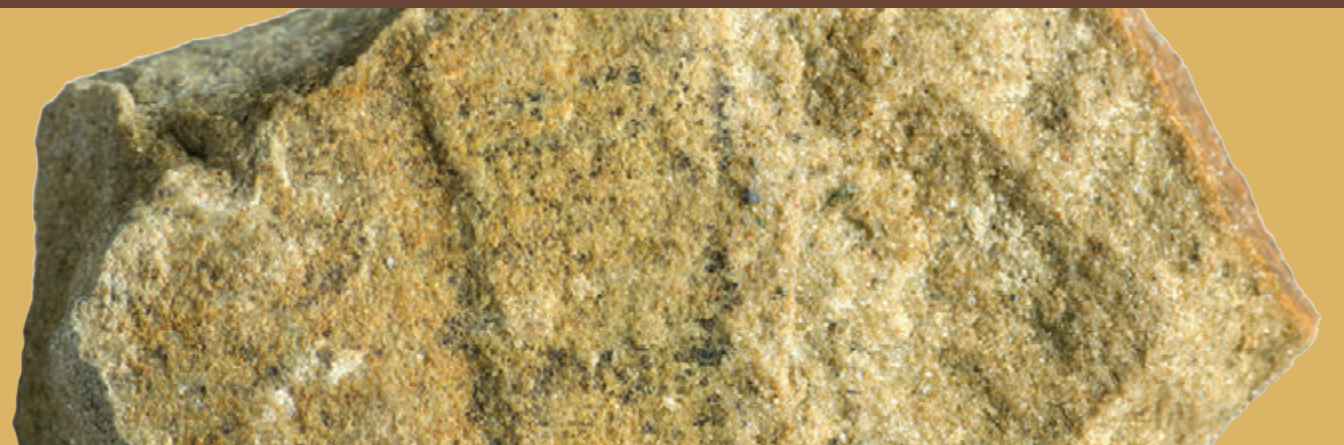


SANDSTONE



Did you know
that sandstone
can be black
most sandstone
is dark brown
to tan but some
is black?

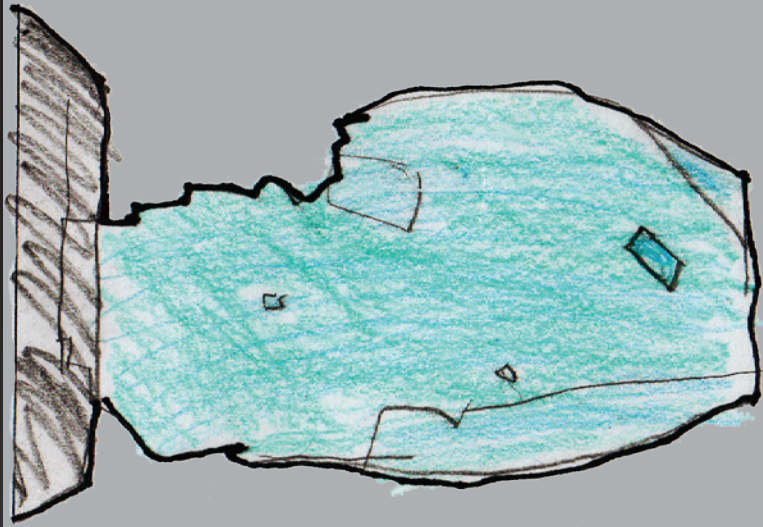
Did you know that sandstone is a common rock to have dinosaur bones in it? Sandstone is formed when sand is compacted and cemented by other sediments. Characteristics of sandstone are rough, layered and it comes in a range of colors. Sandstone can be found anywhere where there was once an ocean or desert. There was once an ocean here. If you want to feel sandstone or see dinosaur bones in it go to Dinosaur Ridge. The fossils at Dinosaur Ridge are as explained as the abc's!



GEMS AND MINERALS

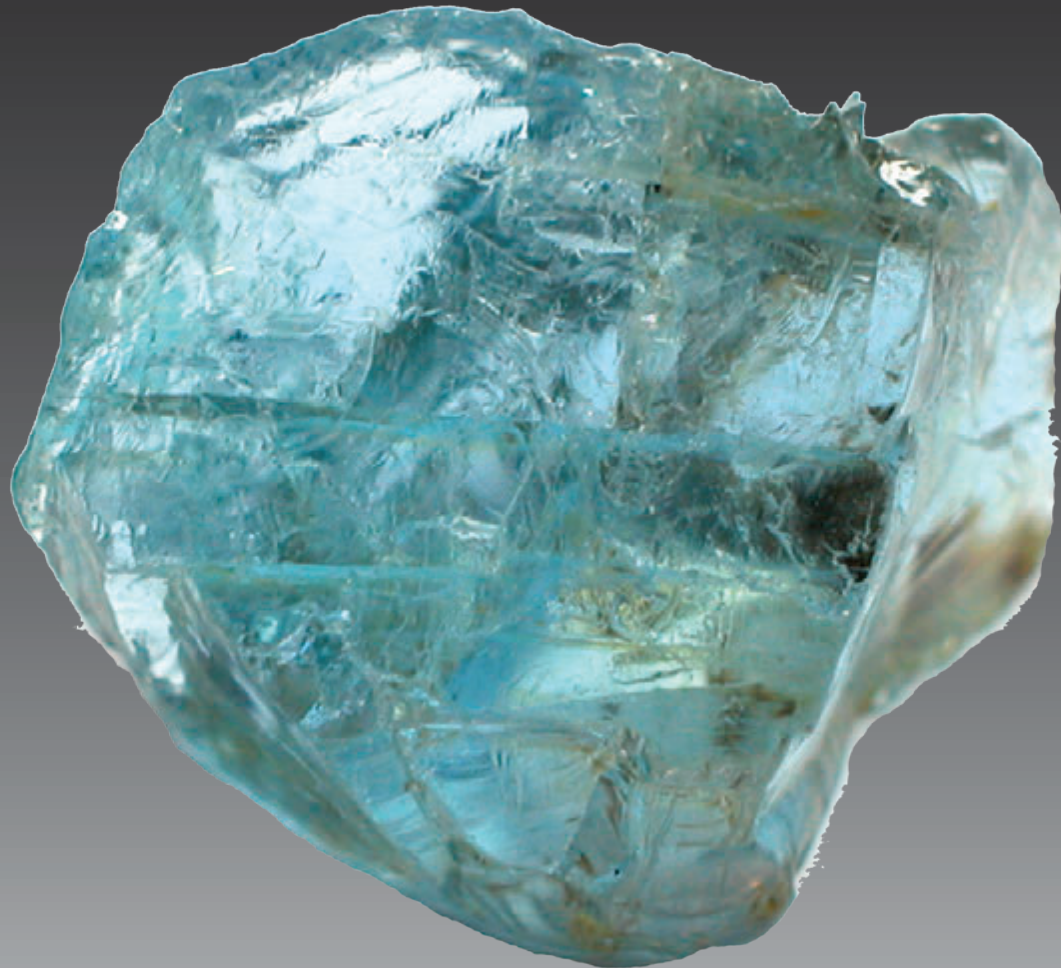


AQUAMARINE



Try it!

See if you can find aquamarine at a museum. Make a chart and check how many times you see aquamarine!



What's hard to find? What has been found weighing over 500,000 carats? What's the Colorado gem? And what's part of the Beryl family? **ASE SOME AQUAMARINE!!** Almost all aquamarines are formed in pegamites. Aquamarine is a type of mineral called beryl. Beryl can be many color, but when it's blue or blue-green, It's called aquamarine. While similar to many other crystals, the process of forming aquamarine is almost entirely dependent on the process of two components: beryl and iron. It is indeed rare to find high quality aquamarine suitable for jewelry and because of this flawless aquamarine stone can

be worth as much as \$2,500 for a single carat. You might be surprised to learn that the largest nearly flawless aquamarine gemstone ever found weighing over 500,000 carats. That's a lot of Money. As magma works its way to the surface or tectonic plates shift, many stones are forced together. Those that are softer are slowly squeezed together forming large deposits. Some of these deposits undergo lengthier amounts of pressure, resulting in beryl gemstones with many impurities. Those that are pushed to the surface or discovered in mines earlier in the process are far more likely to have pure, gem aquamarine crystals. It is suspected that the perlife amounts of gem quality stones found in Brazil are the results of the specific composition of earth found in the area. Many of the stones are softer nature allowing geological pressures to push pegmatite deposits nearer to the surface without forcing significant inclusions in aquamarine deposits. Aquamarine is mostly found in Brazil in mines or surface. It's like emerald, heliodor, red beryl and more. It's blue and green and when deep striking blue. Aquamarine is really cool and it's my birth stone! I lllllooooove aquamarine I hope you like it too and thanks for reading!!

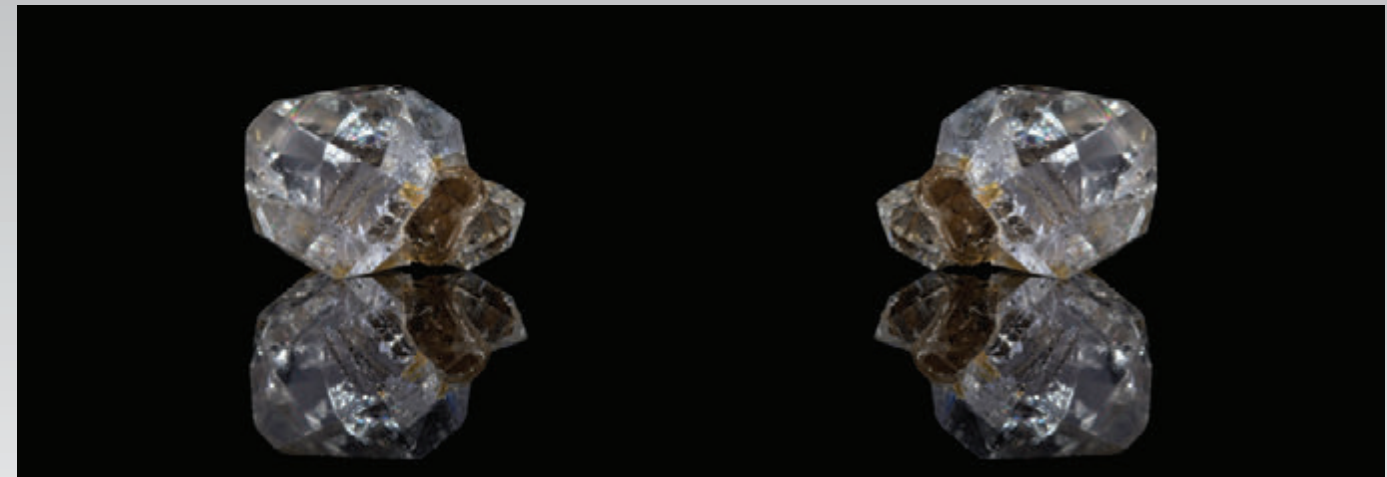


DIAMOND

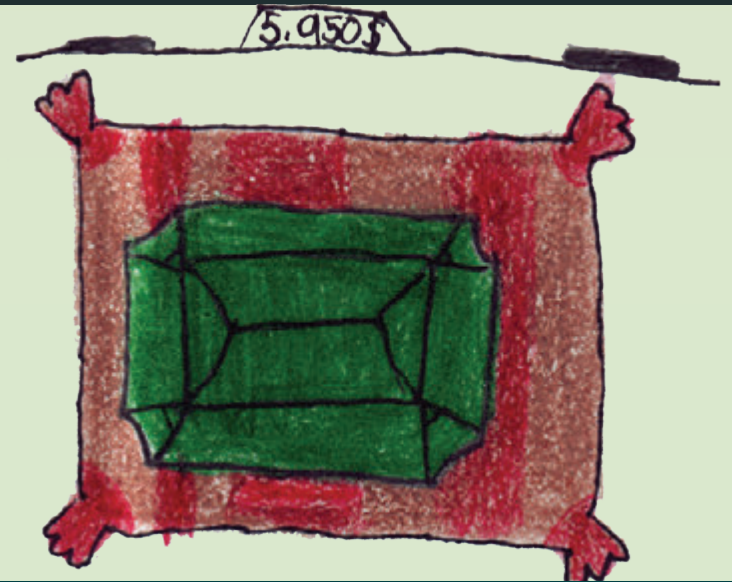


It's a fact
that diamond
only crystallize
at depths of
three-hundred
It's a fact
that the biggest
diamond in
the world weighed
over
one
pound

What is shiney? What is
valuable? What is as white as glass?
It's diamond!!! Diamond is the hardest
mineral of all. Diamond can only be
scratched by other diamonds. Diamonds
need really high pressure to form.
Usually most diamonds need more
than seventy-five miles deep in
the ground. Diamonds can be found
in volcanic rocks called kimberlite.
Diamonds have been seen near craters
that were made by meteorites. How about you
go see if you can find a diamond!



EMERALD



Emerald was a symbol to the Egyptians of fertility and life.

Emerald is as green as a garden, it's shiny. Colors are just like the earth. In order for emerald to be a gem-quality mineral, emerald needs time and space. Emerald needs water and heat to form. Emerald is formed molecule by molecule, after time the molecules make emerald. Emerald is bright green, shiny and translucent. Emerald can be found in Columbia and Brazil. I think that emerald is the coolest gem ever and I hope you do too.



GOLD

non polished
or cut.



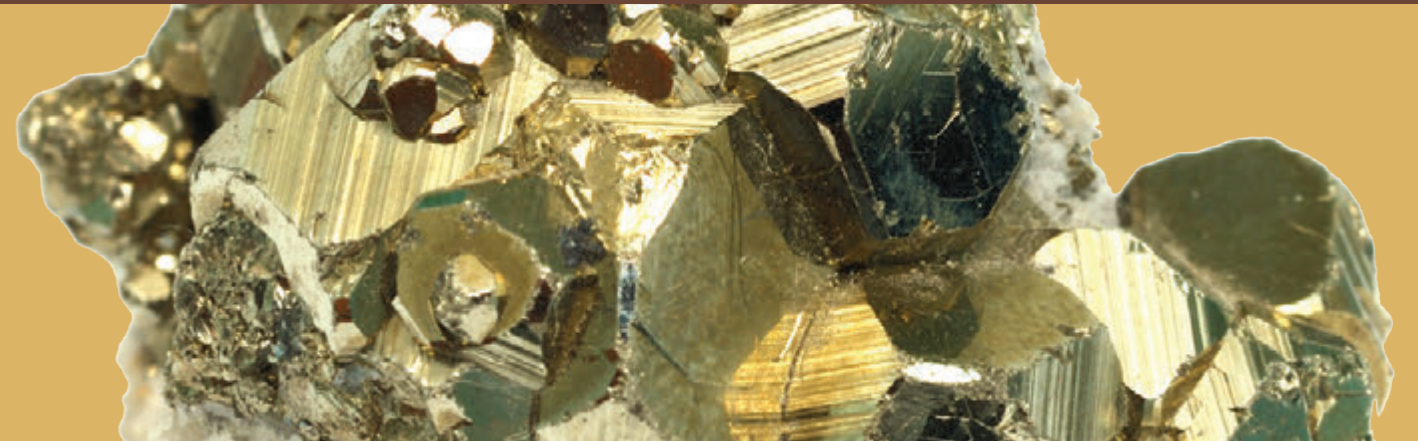
polished
and
cut.



Fun Fact!

Gold is in
soda pop
and only
in little
amounts
though!

What is the most precious rock on Earth? What rock shines as bright as the sun under a shadow? Gold, Gold of course! Gold forms in hydrothermal quartz veins. When the quartz heats up gold is formed. Gold's characteristics are lustrous, fracture surface, bright metallic luster, typically rounded surfaces. Gold can be found at gold mines and in rivers, streams and underground in hydrothermal quartz veins. Now that you know about gold go mine some!



JADE



Jade

Cleavage: good,
perfect

Fracture:
splintery, uneven

Luster: Vitreous,
dull to greasy

Streak: White

Did you know that the Chinese character for jade 玉 (yu), is one of the oldest in the Chinese language? Well, it is! Dark green jade is also called Canada jade, and is found in Western Canada. The best jade stones are found in Burma. Jade is one of the ornamental gems and was used for weapons and is highly prized as a beautiful gem. Jade is formed in metamorphic rocks under pressure and very low temperature conditions. It is green as a wide forest.

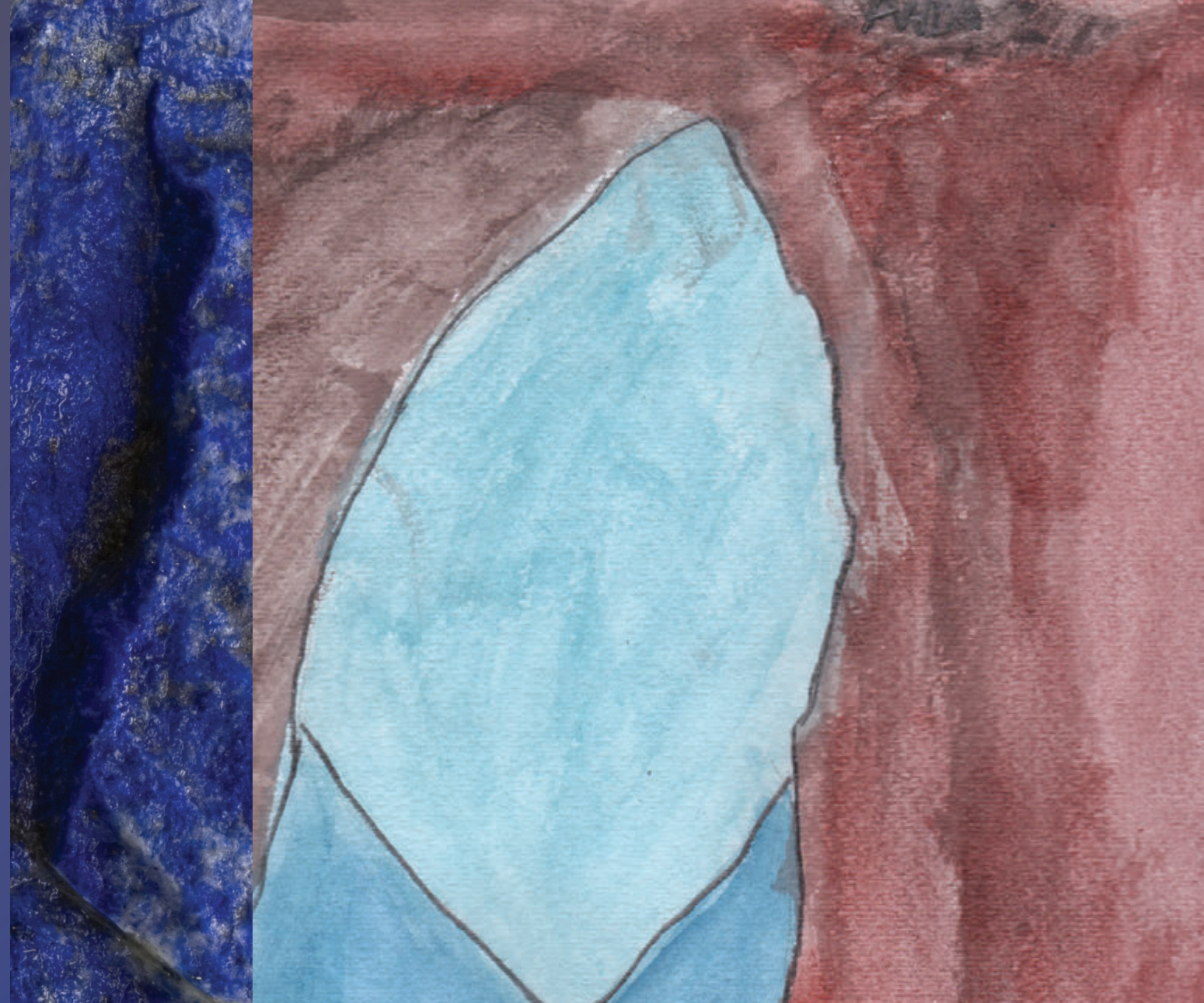


LAPIS LAZULI







Hey Lapis Lazuli
People! Did you know
that Egyptians use
Lapis Lazuli for
decorating their
thrones and for
dramatic eye
make up! I know
it's super weird!

Lapis Lazuli can be found in the northeastern
of Afghanistan. Lapis Lazuli sometimes
has a lot of little specks of pyrite in it.
Lapis Lazuli is smooth and the pyrite on
the Lapis Lazuli is smooth but a little rough.
although lazurite is the main ingredient in Lapis
Lazuli this gemstone also consists of other minerals
such as pyrite and calcite. Because of its pretty blue
color people have been using Lapis Lazuli in jewelry
and other decorative items for thousands of years.
Lapis Lazuli can promote friendship and also
one last thing Lapis Lazuli is pretty rare I know! It's
hard to believe! Lapis Lazuli is very important to



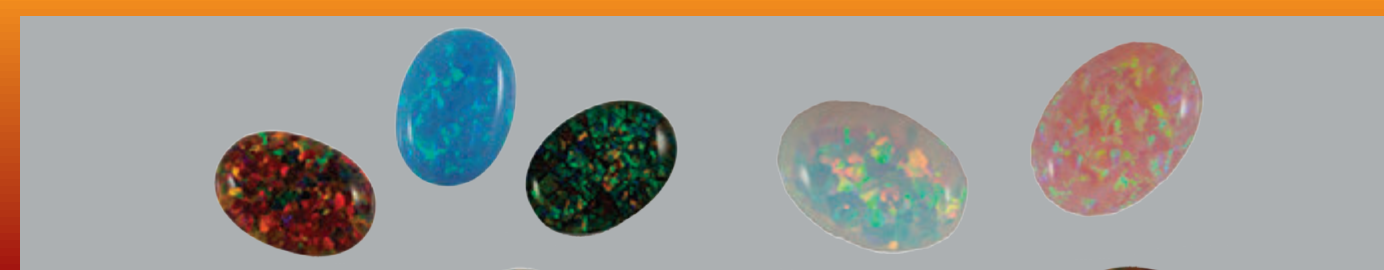
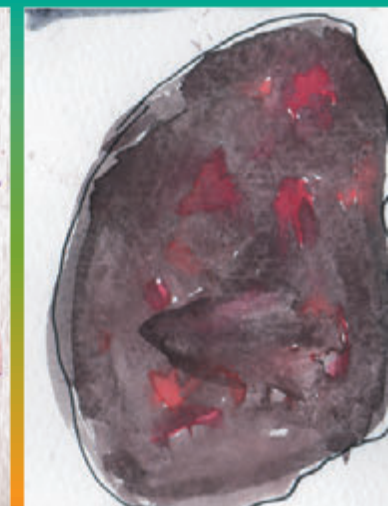
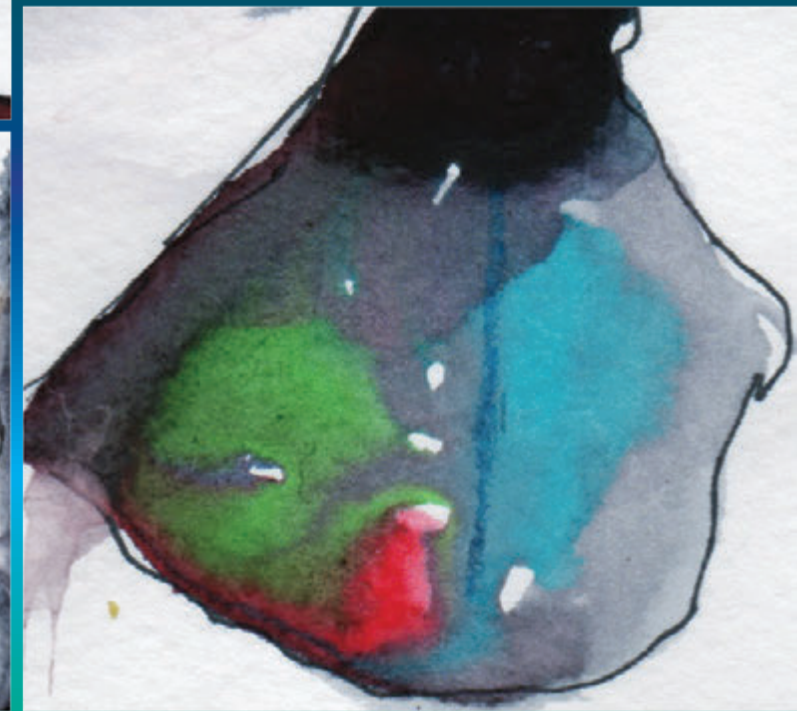
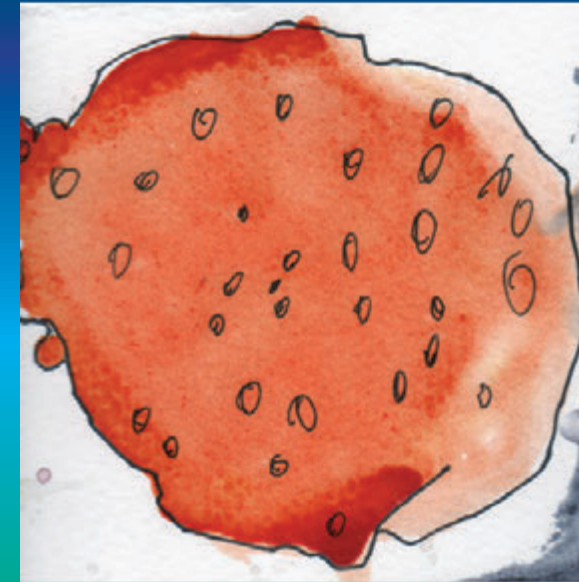
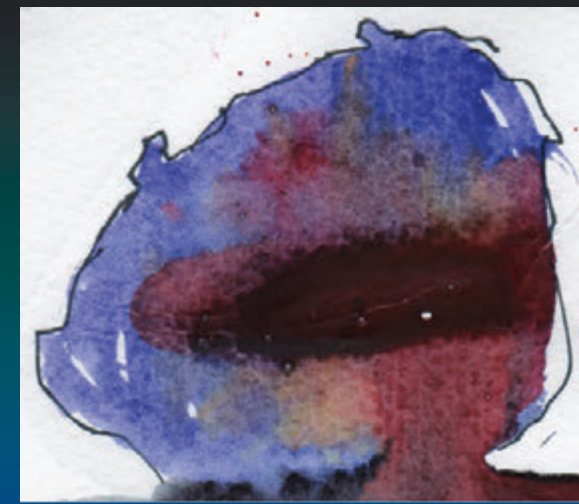
me because it reminds me of my Grandpa
Papa Luoy and he is dead! Lapis Lazuli is as blue as
the sea! Lapis Lazuli is a beautiful rock so
go buy Lapis Lazuli at your local rock and
mineral store!

OPAL

 <p>Precious opal with yellow patch</p>	<p>Honey opal</p> 
<p>Polished fire opal</p> 	<p>Precious opal</p> 

Did you know opal is the October birthstone? and it is super duper colorful! opal is really pretty too.

What is an oxide? What has beautiful colors? What forms in many different places? It's opal of course! There are many different types of opals like fire opals, wood opals and even precious opals. Opals change colors, but some kinds of opals change into more colors than other opals. Did you know that opal is pretty hard to find? Opals are as colorful as a rainbow and pretty like a swan! Opal is often found in hot springs. Some opals have nodules like precious opals others have stuff like resinous lusters like wood opals. I think you should get your own opal!



PHENAKITE



Did you know
phenakite is
a shiny rock?
Did you know
phenakite is
pink?

What is shiny? What
is pink? it's phenakite
high-temperature pigment
its veins and in its mica
schists with quartz, has long
been known from the emerald of
phenakite is special color is usually
or white but can be tinted yellow,
brown and pink. Luster is vitreous
transparency crystals are translucent
to translucent. crystal system: trigonal
hard. if you like this rock you
can go to The Denver Rock Museum.

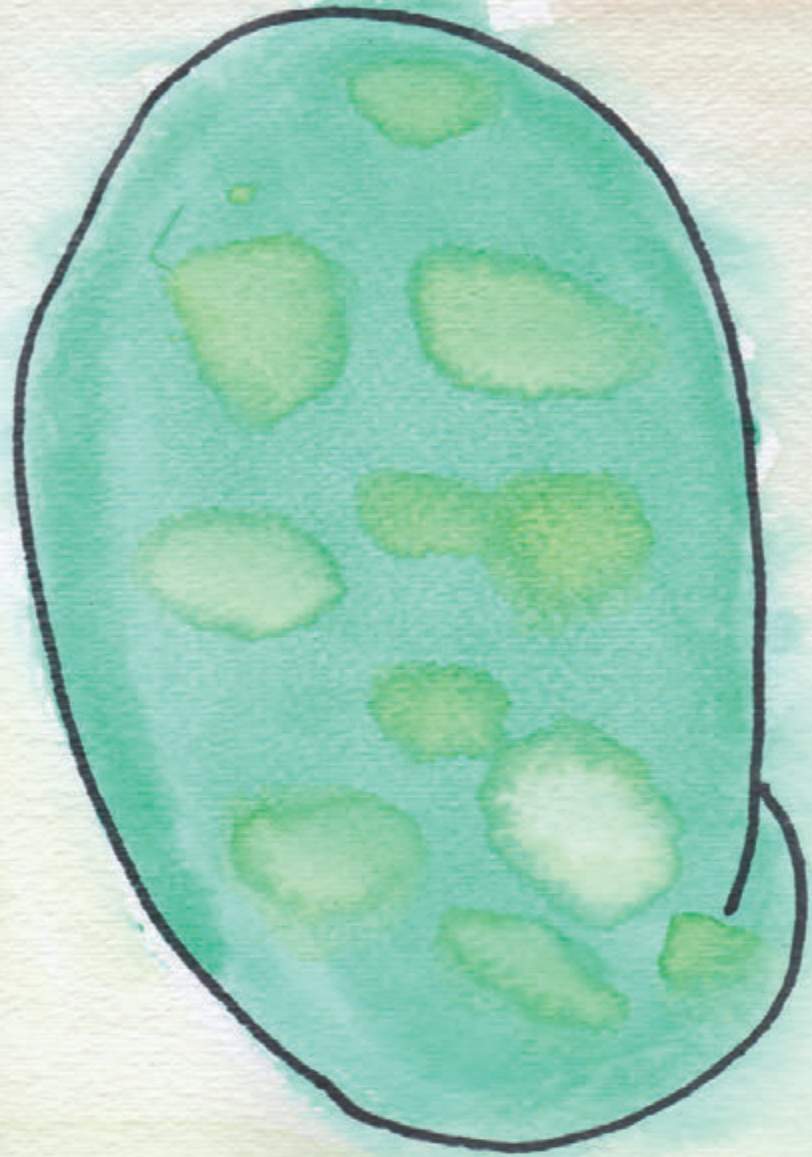


PRECIOUS OPAL



try it
if you want
to find precious
opal go to Florissant
Fossil monument.
Look for sand
stone and open
it and opal may
be there

What is the October Birthstone?
It starts with precious? precious
opal!!!! It forms in low temperatures
around hot spring. Lots of water
helps form precious opal. roads
below the earth. Milky white reds
blue, yellow are the main colors of this
rock. warmed in hand it appears dark
green. Queensland, boulder opal is
actually precious opal. Did you
know? Displaying play of color are
known as precious opal gem form of
this stone. Black opal
with a dark blue dark green or
background. I was lucky to
be able to study this I
love it !!

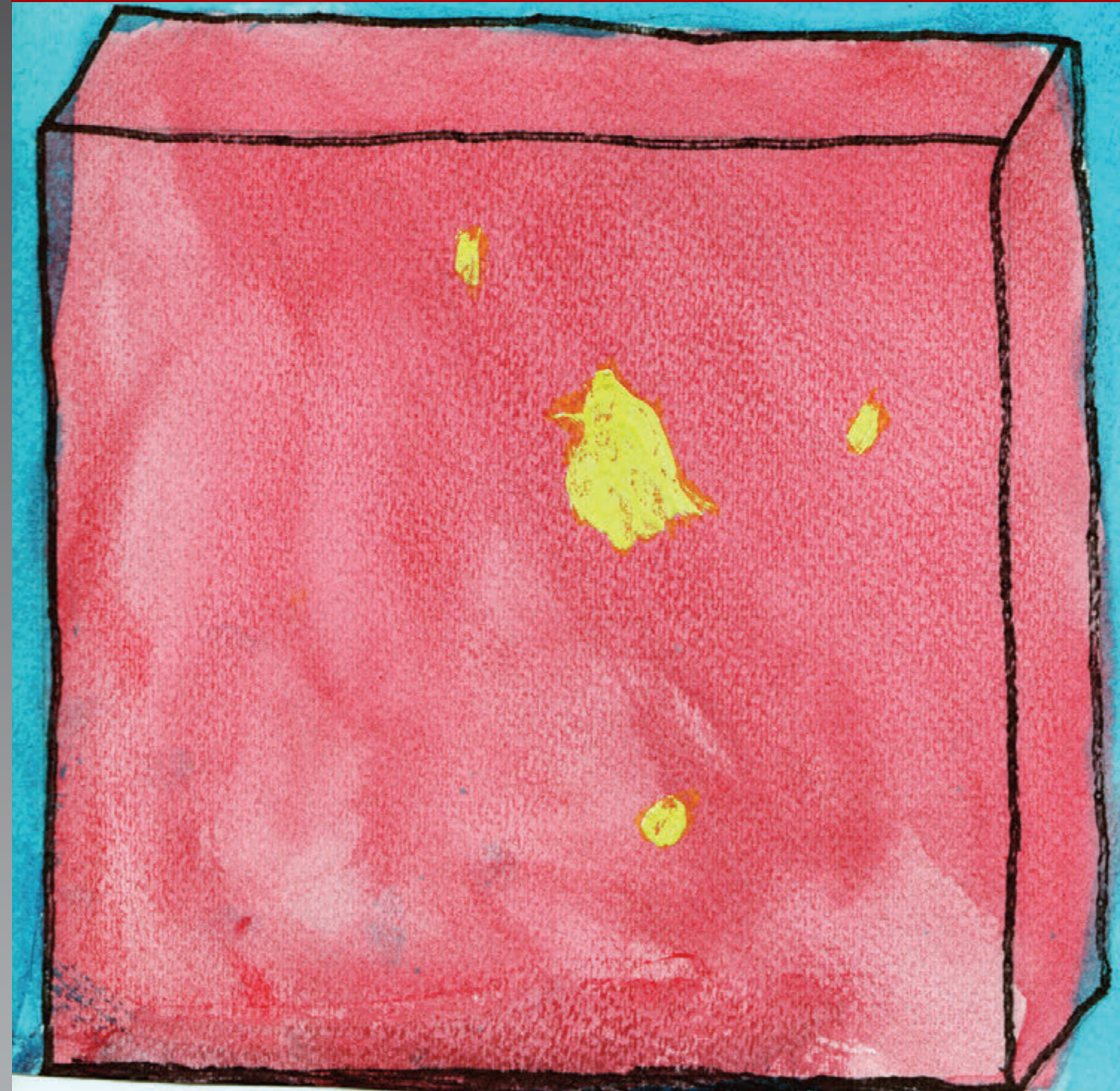


RHODOCHROSITE

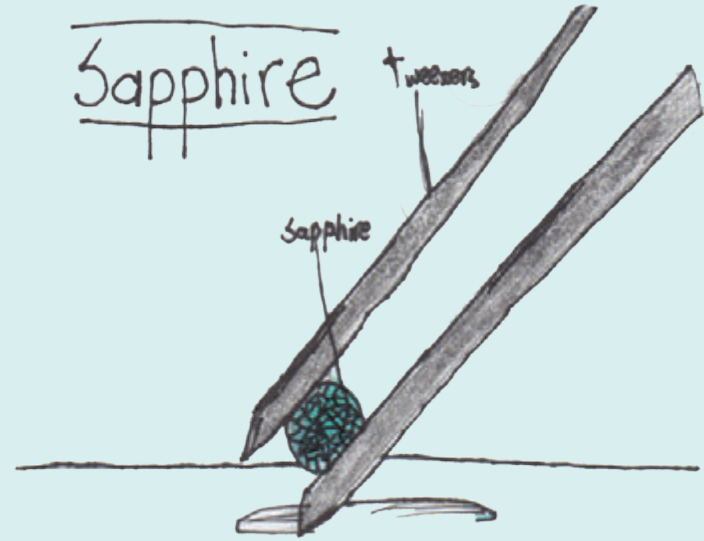


Origin of the name
The name rhodochrosite
comes from the greek
words "rhodon" which
means "rose"!!

What is thought of as the most powerful love stone, attract perfect love and to enable the wearer to achieve self-love..... Rhodochrosite of course. How is it formed? Heat and water dissolves minerals. This mixture forms rhodochrosite in veins of rock. Characteristics. Rhodochrosite is red to pink and sometimes almost white, yellow, and brown. Rhodochrosite is as red as a strawberry. Where it can be found. Romania was where it was first found, and Argentina is where it is usually found.



SAPPHIRE



Aluminum Oxide
 Al_2O_3 Family Oxides
Key test: Hardness
Crystal system:
hexagonal, trigona-
l. Fracture:
Conchoidal to
Uneven

What is shiny? What is blue? What is on jewelry? Sapphire of course! Tiny bits of titanium added to corundum create the blue in sapphire. Sapphire forms on certain igneous and metamorphic rocks. Blue sapphire can be used in ornamental jewelry and is the most precious blue gem. Sapphire is most commonly found in Kashmir, Burma, and Sri Lanka. It is as crystal clear blue as the wide mediterranean sea



SCHEELITE

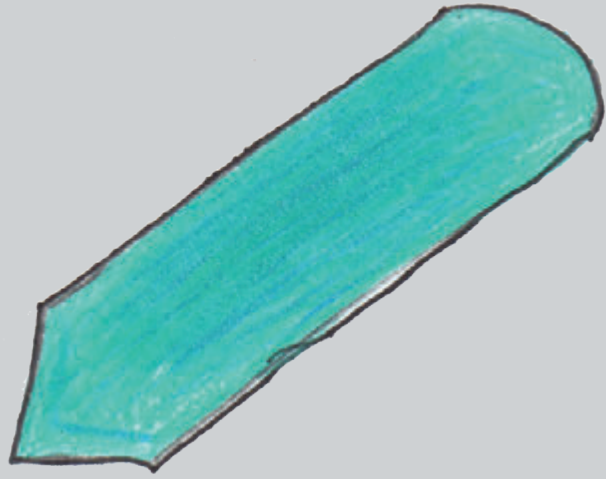


Fun facts
It is easy to tell
if you've found
Scheelite. Rub
it with your
fingers. Does it
feel grainy? Bits
of sand come off
on your fingers? It's Scheelite

What are made out of QUARTZ and mica or other minerals? It feels Bumpy and rough and tough. Scheelite is sedimentary. ▽ It formed BY either rocks, and water and dirt and Sun, all mixed together to make Sandstone. It is bumpy it is a little bit smooth It looks like it is painted. It is fragile it is grey it is a little bit soft. ▽ You can find it BY the rivers and on the mountains and on rocks and on fossils. ▽ You should come to Dinosaur ridge because there are a lot of giant dinosaur foot prints and some other dinosaur stuff that is cool.



SELENITE

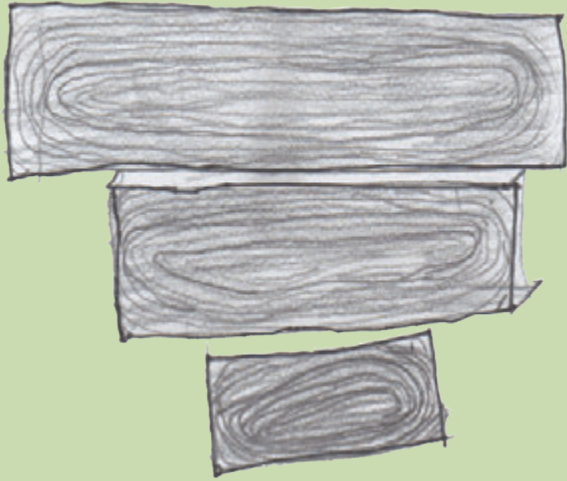


Fire and
brimstone!
I Spew out
Of foul jets
from volcanoes
and hot
springs and
I'm a real
Stinker.

Selenite is a crystallized form of gypsum. Chemically, it is a hydrated calcium sulfate. Selenites are soft in color. They are bright, colorful, and brittle. It can be found around hot springs and in hydrothermal areas. I love how shiny it is. It makes my eyes sparkle.

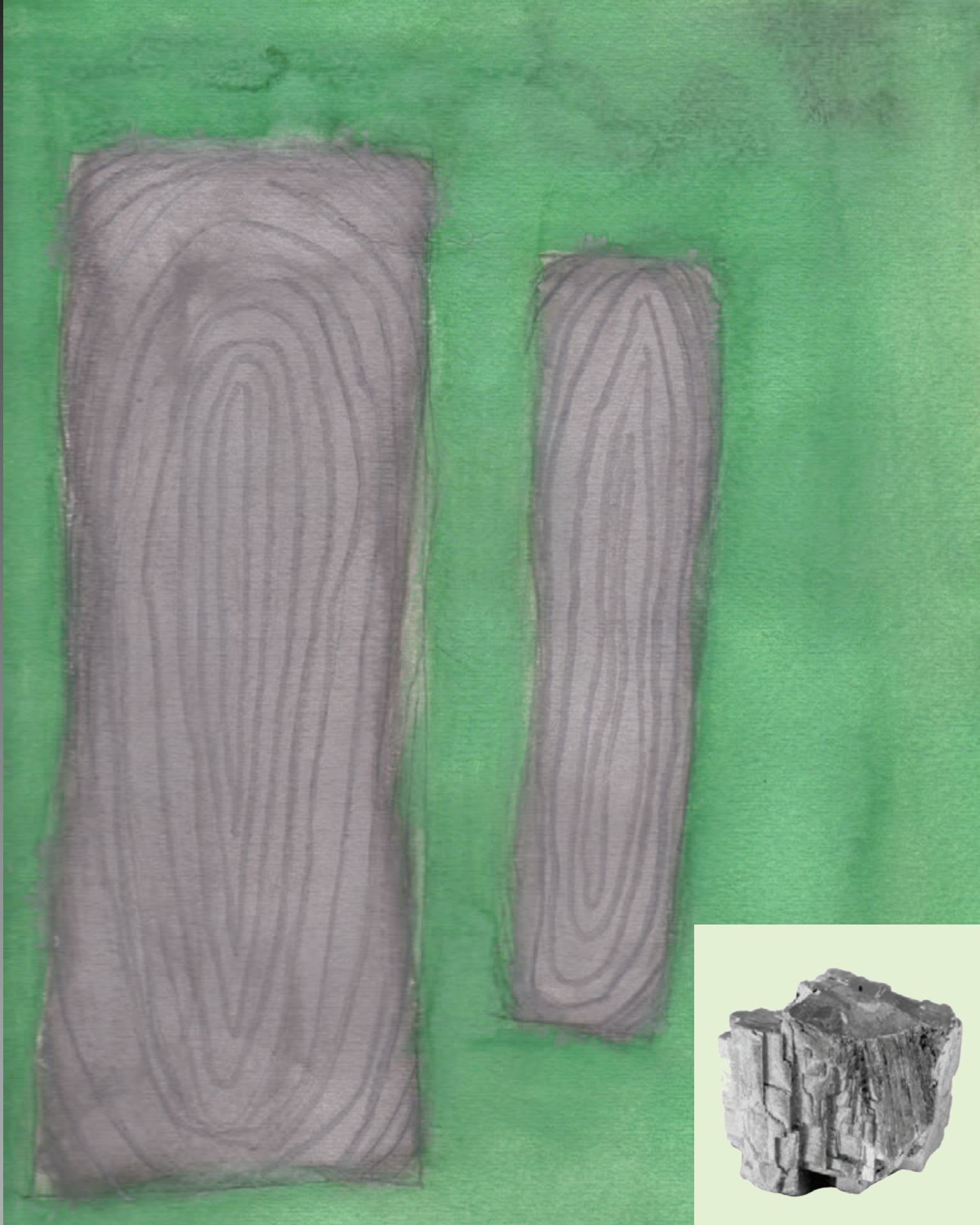


SILVER



Try it !!!!
Feel the rock
Is it soft? Can
you feel bumps?
And is it silver?
If it is than
It is silver.

Did you know silver is silver and it is really precious. It formed in the Earth's crust. Which is really hot. So don't touch it yet. It is soft, silver is white and grey. Silver is really easy to break. It formed in the Earth's crust which is hot. When you are a grown up try to go looking for silver. Silver is as grey as a colored pencil.

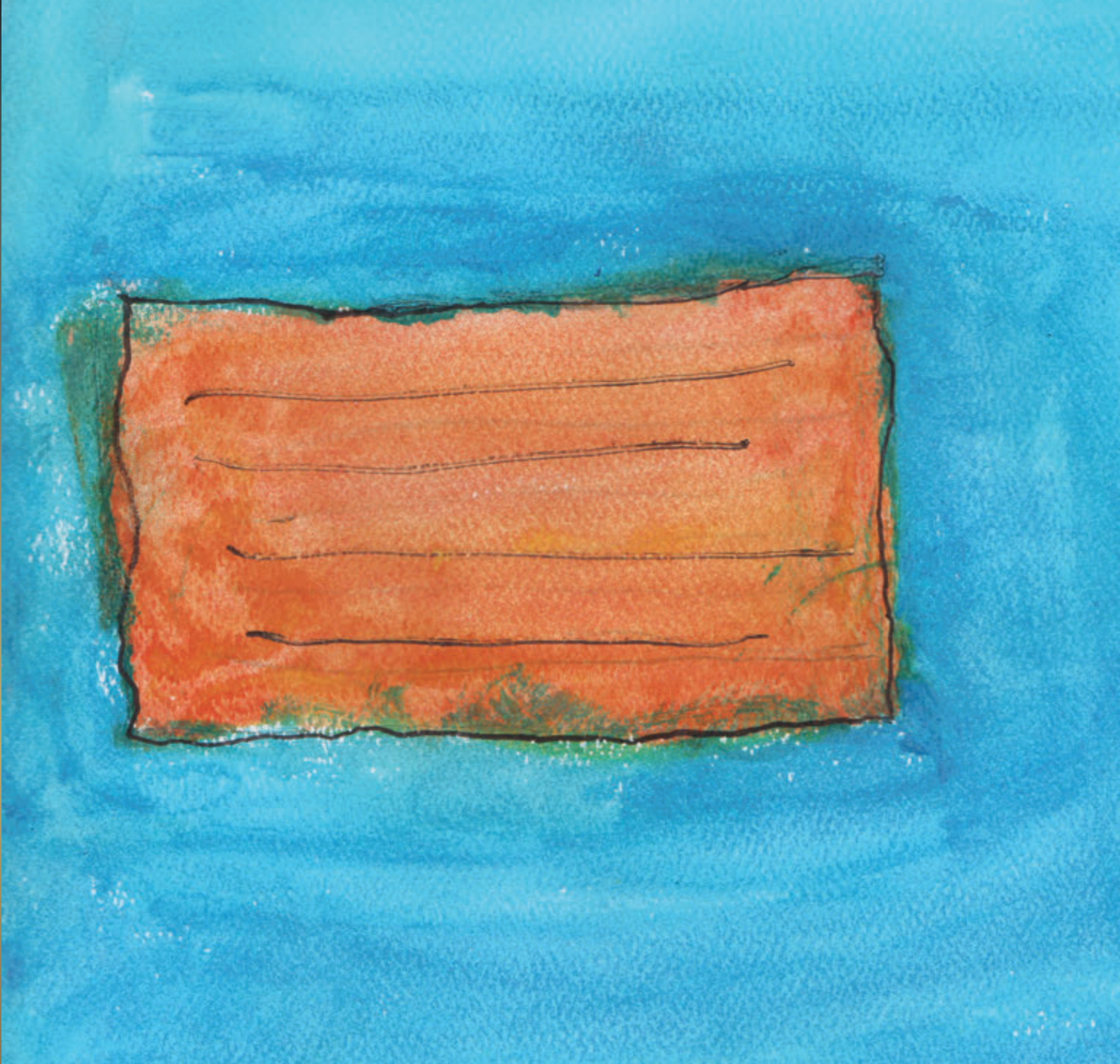


TOPAZ



Topaz is a
shiny rock
it comes in
lots of colors
maybe you
have some.

Topaz often forms in crystals
with rectangular sides. Topaz can
have no color or be white yellow green
red or blue. Topaz can be found in granite
or rhyolite. Topaz can be found at pikes peak.
I like Topaz because it is the November
birthstone! Maybe you can go up to
the mountains and find some.



TURQUOISE



Did you know?
It's very unlikely that you'll find turquoise in crystals, they're often found as a rocky mineral.

Did you know turquoise is a rock? Some believe that processing turquoise may bring you success in your life. It's my birth stone. Turquoise is formed in aluminum-rich igneous or sedimentary rock. It's found mostly by water. Turquoise is blue and green mixed, it has a pale green streak. Turquoise can be found in North and South America, Asia and Africa. This oily mineral is as oily as a buttered pan.



THE GEOLOGISTS AT WORK









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ABOUT THE AUTHORS



David's Crew Rocks
because they're studying rocks.
There many Rocks students are
studying. It's so cool to see
students working on these rocks.
In fact it is awesome!

