

We Will Rock You!

By: Stefanie Louw

#rocks #nature #geology #internationalrockday



Stack of rocks

What did the rock do when it rolled down the road? It ROCKNROLLED. Hahaha... But today's lesson isn't about the type you listen to, but the kind you trip over or skip across a lake. Rocks form the basis of the Earth's structure. The Earth's crust, MANTLE, and even parts of its core are composed of various types of rock. These solid little nuggets have been around for billions of years, just chilling while empires rise and fall. Some are shiny, some are dull, and some are worth more than your house (looking at you, DIAMONDS). Rocks may seem boring at first, but they've got layers, literally, so let's dig in!

What did the rock do when it rolled down the road? ROCKNROLLED

I said that today's lesson isn't about the rock you ...to? LISTEN

We are talking about the type of rock you ...? TRIP OVER / SKIP
ACROSS A LAKE

Rocks form the basis of the... EARTH'S STRUCTURE

Name a part of Earth that is made up of rocks from the paragraph.
CRUST / MANTLE / CORE

These little nuggets have been around for how long? BILLIONS OF
YEARS

What kind of rocks can be worth more than your house? DIAMONDS

Point to the top round rock in the picture above.

So what is a rock, exactly? Rocks are AGGREGATES (structures formed from a mass of fragments) of minerals. Some rocks, like GRANITE, are made of a mix of minerals, while others, like limestone, are made mostly

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of one mineral. There are three main types of rock: IGNEOUS, SEDIMENTARY, and METAMORPHIC. Igneous rocks form from cooled magma or lava (like basalt or OBSIDIAN). Sedimentary rocks like sandstone form from compressed layers of material over time. And metamorphic rocks, think marble, change due to heat and pressure deep underground. Through the rock cycle, rocks constantly transform from one type to another over millions of years. Earth is always reshaping itself!

Rocks are ... of minerals? AGGREGATES

What are aggregates? STRUCTURES FORMED FROM A MASS OF FRAGMENTS

Name the rock that's made up of a mix of minerals mentioned?

GRANITE

Name one main type of rock? IGNEOUS / METAMORPHIC / OBSIDIAN

How are igneous rocks formed? FROM COOLED MAGMA OR LAVA

Give an example of igneous rock from the text. BASALT / OBSIDIAN

Sandstone is what type of rock? SEDIMENTARY

Sedimentary rocks form from what? COMPRESSED LAYERS OF MATERIALS

Give an example from the paragraph of a type of metamorphic rock.

MARBLE

Metamorphic rocks change due to...? HEAT AND PRESSURE DEEP UNDERGROUND

Through the ... rocks constantly transform? ROCK CYCLE

Earth is always ...itself? RESHAPING

Watch this fun parody video on the rock cycle: **WE WILL ROCK YOU!** (The Rock Cycle) (2:14)

https://www.youtube.com/watch?v=0dB9O8A__VA

Beautiful rocks like diamonds and marble, are formed through pressure, how do you think this metaphor can be applied to the human experience?

The science of studying rocks and how they form is called PETROLOGY, a branch of geology, which is the study of Earth itself. Petrologists look at everything from MICROSCOPIC mineral grains to towering mountain ranges, helping us understand how the Earth has changed over time. If you've ever been curious about volcanoes, gemstones, or fossils, you've already been thinking like a GEOLOGIST!

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What is the science of studying rocks and how they form called?

PETROLOGY

What is petrology? THE SCIENCE OF STUDYING ROCKS AND HOW THEY FORM

Petrology is a branch of which study? GEOLOGY

What is geology? THE STUDY OF EARTH ITSELF

Name something petrologists look at? MICROSCOPIC MINERAL GRAINS / TOWERING MOUNTAIN RANGES

You might think like a Geologist if you are curious about ...?

VOLCANOES / GEMSTONES / FOSSILS

Name a famous mountain range in your area. DRakensberg / HIMALAYAS / ANDES etc.

If you could study anything, what would it be and why?



Picture of an ammonite

Humans have been fascinated by rocks since the beginning of time. Early tools were made from flint, obsidian, and QUARTZITE. Ancient people carved jade and turquoise into ornaments and sacred objects. And we can't forget fossils, which are often found in sedimentary rocks and give us a peek into life millions of years ago. Some rocks and minerals appear so unusual that legends and stories have sprung up around them. People once believed in SNAKESTONES, which they

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thought were coiled snakes that had turned into stone. In reality, these were often fossils of ancient marine creatures like AMMONITES (shelled CEPHALOPOD). But the myths show just how much wonder and curiosity rocks have sparked through the ages.

Humans have been ... by rocks since the beginning? FASCINATED

Name something early tools were made of, from the text? FLINT / OBSIDIAN / QUARTZITE

Ancient people carved ... into ornaments and sacred objects? JADE / TURQUOISE

People once believed in ... which they thought were coiled snakes that had turned into stone? SNAKESTONES

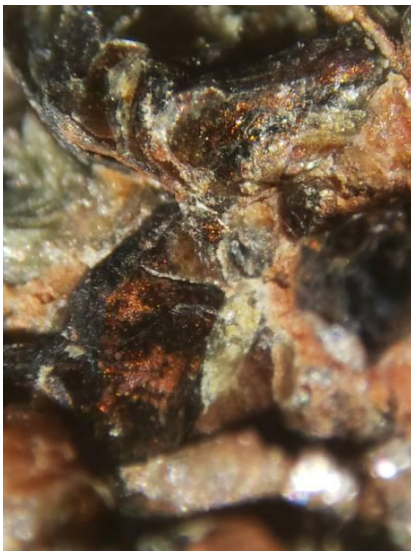
What were snakestones believed to be? COILED SNAKES THAT HAD TURNED INTO STONE

What were snakestones in reality? AMMONITES

What is an ammonite? SHELLED CEPHALOPOD

Name another example of a cephalopod. OCTOPUS / CUTTLEFISH / SQUID / NAUTILUS etc.

Trace the shape of the ammonite with your finger



Painite



Tanzanite

But rocks aren't just old, they're rare, beautiful, and sometimes mysterious. Take PAINITE, for example. It is a reddish-brown to orange-red BORATE mineral made up of calcium, ZIRCONIUM, BORON, aluminium, and oxygen, with traces of iron and other elements.

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Discovered in MYANMAR, it was once considered the rarest mineral in the world, with only two known samples. Then there's TANZANITE, a blue and violet variety of the mineral ZOISITE, known for its vibrant, TRICHROIC (displaying three colours) hues. Found only near Mount Kilimanjaro in Tanzania and nowhere else on Earth.

But rocks aren't just old, they're rare, beautiful, and sometimes...?

MYSTERIOUS

What is the reddish-brown to orange-red borate mineral called?

PAINITE

What colour is painite? REDDISH BROWN TO ORANGE RED

Name one mineral that painite is made up of? CALCIUM / ZIRCONIUM / BORON / ALUMINUM / OXYGEN / TRACES OF IRON / OTHER ELEMENTS

Where was it discovered? MYANMAR

Painite was once considered what? THE RAREST MINERAL IN THE WORLD

What is the blue and violet rock called? TANZANITE

Which mineral does tanzanite come from? ZOISITE

What word means displaying three colours? TRICHROIC

What does trichroic mean? DISPLAYING THREE COLOURS

Where is tanzanite found? ONLY NEAR MOUNT KILIMANJARO IN TANZANIA AND NOWHERE ELSE ON EARTH

What is the name of the safari National Game Park in Tanzania? THE SERENGETI

If you could visit anywhere in the world, where would it be and why?

Point to the picture of the tanzanite.

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Heart of gems

Throughout history, people have believed that rocks hold mystical properties. The Greeks thought QUARTZ was ice, while Native American cultures saw TURQUOISE as a protector. Today, some people use crystals in healing or meditation. LITHOTHERAPY, or crystal healing, is the idea that stones and crystals have their own kind of energy that can help us feel better, physically, emotionally, and even spiritually. The belief is that each type of crystal gives off a unique vibe that can support different parts of our lives in positive ways.

Throughout history, people have believed that rocks hold ... properties?
MYSTICAL

What did the Greeks think ice was? QUARTZ

Native American cultures saw turquoise as a what? PROTECTOR

Today, some people use crystals in what? HEALING / MEDITATION

What is known as crystal healing? LITHOTHERAPY

In crystal healing, the idea is that stones and crystals can help us to feel better ...? PHYSICALLY / EMOTIONALLY / SPIRITUALLY

What is something that you believe can help you feel better or more positive?

Watch: 5-Minute meditation you can do anywhere -Goodful 5:16

<https://www.youtube.com/watch?v=inpok4MKVLM>

Artists have loved rocks, too. The brilliant red colour of CINNABAR, a mineral rock powder, was used from Ancient Greek times to the Middle Ages for painting manuscripts and art. Other minerals like LAPIS LAZULI

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were ground down to create intense blues in RENAISSANCE paintings. South African rock paintings were made using pigments sourced straight from nature. The San people, who painted them, used red and yellow OCHRE, charcoal for black, MANGANESE oxide for browns, and white clay for lighter highlights. To turn these powders into paint, they mixed them with things like egg whites, plant sap, blood, or even urine — whatever was handy in the wild.

Who has loved rocks, too? ARTISTS

Which rock powder was used from Ancient Greek times to the Middle Ages? CINNABAR

What is the colour of cinnabar? BRILLIANT RED

Cinnabar was used for what? PAINTING MANUSCRIPTS AND ART

What mineral was used to create intense blues? LAPIS LAZULI

What paintings were made using pigments sourced straight from nature? SOUTH AFRICAN ROCK

What did the San people use to create the red and yellow colours? OCHRE

What was used to create black? CHARCOAL

What was used to create brown? MANGANESE OXIDE

White clay was used for? LIGHTER HIGHLIGHTS

Name something that was used to turn the powders into paint? EGG WHITES / PLANT SAP / BLOOD / URINE

Some rocks even come from space! METEORITES are chunks of rock or metal that survive their fiery fall through Earth's atmosphere. The famous ALLENDE meteorite is a CARBONACEOUS CHONDRITE that fell in Mexico on 8 February 1969, and is notable for being the largest of its kind ever found. It broke up in the atmosphere, scattering pieces over a large area in the state of CHIHUAHUA, Mexico. CHONDRULES, the defining feature of chondrites, are millimetre-sized, round or elliptical inclusions that formed from molten droplets in the early solar NEBULA. Meteorites often contain rare elements and give scientists insight into how our solar system was formed. Some even break off from asteroids, which orbit the sun between Mars and Jupiter.

Some rocks even come from...? SPACE

What are chunks of rock or metal that survive their fiery fall through Earth's atmosphere called? METEORITES

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What are meteorites? CHUNKS OF ROCK OR METAL THAT SURVIVE THEIR FIERY FALL THROUGH EARTH'S ATMOSPHERE

What is the name of the famous meteorite that fell in Mexico? ALLENDE METEORITE

What type of meteorite is it? CARBONACEOUS CHONDRITE

When did the meteorite fall? 8 FEBRUARY 1969

In which Mexican state did it fall? CHIHUAHUA

Chihuahua is also a breed of what? DOG

What is the defining feature of chondrites called? CHONDRULES

What shape is a condrule? ROUND / ELLIPTICAL

What was the condrule formed from? MOLTEN DROPLETS IN THE EARLY SOLAR NEBULA

What do meteorites give scientists insight into? HOW OUR SOLAR SYSTEM WAS FORMED

Some meteorites even break off from ...? ASTEROIDS

The region between Mars and Jupiter is primarily known as what? THE ASTEROID BELT

Name another planet in our solar system apart from Earth, Mars, or Jupiter? MERCURY / VENUS / SATURN / URANUS / NEPTUNE



Racetrack Playa

In Death Valley's RACETRACK PLAYA, huge rocks, some weighing hundreds of kilograms, MYSTERIOUSLY slide across the dry lakebed,

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Question code key: KNOWN / TIGHT SEMI-OPEN / BROAD SEMI-OPEN / PRIOR KNOWLEDGE / MATH / OPEN / VAKT

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leaving long trails behind them. For years, no one knew how they moved, since no one had ever seen it happen. These "SAILING STONES" puzzled scientists until 2014, when GPS and time-lapse cameras finally cracked the case. The secret? A rare mix of water, ice, and wind. When the playa gets covered in water from rain or snow, it can freeze overnight into thin sheets of ice. As the sun melts the ice during the day, wind pushes the floating ice panels across the surface, gently dragging the rocks with them. It's a slow, quiet process, but one of nature's coolest tricks!

In Death Valley's ... huge rocks slide across the dry lakebed.

RACETRACK PLAYA

OR: *Where can these moving rocks be observed?* DEATH VALLEY'S RACETRACK PLAYA

What are these moving rocks also known as? SAILING STONES

These sailing stones ____ scientists? PUZZLED

Until when has this phenomenon puzzled scientists? 2014

Name one thing the scientists used to crack the case? GPS / TIME LAPSE CAMERAS

Name one of the 'secrets' of the sailing stones that scientists discovered? WATER / ICE / WIND

When the playa gets covered in water from ...? RAIN / SNOW

The rain or snow freezes overnight into ...? THIN SHEETS OF ICE

What is a phenomenon that puzzles you that you would like to know more about, or one that you know about and can tell me more about?

In your own words, summarise what happens to the rocks at Racetrack Playa?

And rocks aren't just scientific; they've helped shape human culture, too. In ancient Jordan, people carved the city of PETRA, known as the Rose City, directly into sandstone cliffs. The rose colour results from the iron oxide in the rock. On Easter Island, giant MOAI statues were carved from volcanic TUFF. Originally believed to be only heads, they are actually full-bodied statues and are believed to represent the deified ancestors of the RAPA NUI people.

Rocks aren't just scientific; they've helped shape ... too? HUMAN CULTURE

In ancient ... people carved the city of Petra? JORDAN

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What was Petra also known as? THE ROSE CITY

Into what was it carved? SANDSTONE CLIFFS

The rose colour resulting from the ... in the rock? IRON OXIDE

On Easter Island, giant ... statues were carved? MOAI

What are the statues carved from? VOLCANIC TUFF

The statues were originally believed to be only a head, they are actually ...? FULL BODIED STATUES

The statues represent the deified ancestor of the ... people? RAPA NUI

OR: *What do they represent?* THE DEIFIED ANCESTORS OF THE RAPA NUI PEOPLE

In which ocean is Easter Island? PACIFIC OCEAN



Oyster with a pearl

Believe it or not, some rocks even show up in our bodies and food. Pearls form when a MOLLUSC coats an irritant, like sand or a parasite, with layers of NACRE or mother-of-pearl over months or years. Oysters and mussels are the best-known pearl makers, but clams, CONCHES, and abalone can produce them too. GALLSTONES are hard, mineralised substances that form in the gallbladder, sometimes as big as golf balls. In India, volcanic stones help ferment DOSA batter (made from rice and lentils), giving it a unique flavour. In Iceland, lava rocks are used to bake bread underground with natural steam. Geology can be beautiful and tasty!

Some rocks even show up where, according to this paragraph? BODIES / FOOD

Pearls form when a ... coats an irritant? MOLLUSC

Name one of the irritants mentioned? SAND / PARASITE

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Molluscs coat the irritant with layers of what? NACRE / MOTHER OF PEARL

Name a mollusc that can make pearls? OYSTERS / MUSSELS / CLAMS / CONCH / ABALONE

What are hard mineralised substances from the gallbladder called? GALLSTONES

Gallstones can sometimes be as big as ...? GOLF BALLS

In India, ... stones help ferment dosa batter? VOLCANIC

Name one thing dosa batter can be made of? RICE / LENTILS

Where are lava rocks used to bake bread? ICELAND

What is an irritant or challenge in your life, and how can you transform it into something more positive or beautiful, like the molluscs do with a pearl?

And here's a fun fact for your ears: some rocks can actually ring like a bell. At Ringing Rocks Park in PENNSYLVANIA, striking certain stones causes a metallic chime. Scientists believe it has to do with their dense, uniform mineral structure. Nature's own rock concert! Rocks even helped people find their way across oceans. The Vikings are believed to have used SUNSTONES, a special type of CALCITE crystal, to navigate cloudy skies. These rocks could polarise light and show the sun's position, even when hidden, an ancient GPS in crystal form!

Some rocks can actually ring like a ...? BELL

Where is Ringing Rocks Park located? PENNSYLVANIA

Striking certain stones causes a ...? METALLIC CHIME

Scientists believe that this metallic chime has to do with their ...?

DENSE UNIFORM MINERAL STRUCTURE

Rocks even helped people find their way across ...? OCEANS

The ... are believed to use rocks for finding their way? VIKINGS

What were these rocks that the Vikings used called? SUNSTONES

Sunstones are a special type of ... crystal? CALCITE

These rocks could ... light and show the sun's position even when hidden? POLARISE

How could these rocks be used even when the sun was hidden? THESE ROCKS COULD POLARISE LIGHT AND SHOW THE SUN'S POSITION EVEN WHEN HIDDEN

VAKT: Watch from 1:57 - 3:18: Ringing Rocks Park | Chuck's Big Adventure in Pennsylvania

<https://www.youtube.com/watch?v=JiLDI2Krv2M&t=174s>

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Painted rocks

Rocks are so cool, they even have their own special day. INTERNATIONAL Rock Day is on the 13th of July each year. So, whether you start a rock collection, paint stones, go fossil hunting, or simply take a walk, look more closely at the ground beneath your feet. The Earth is full of wonders if we take the time to notice. Rocks may seem silent, but they hold epic tales of ancient VOLCANOES, deep oceans, space travel, and human belief. So today, take a moment to pick up a rock, and wonder where it's been.

When is International Rock Day? (day, month) 13TH OF JULY

So *whether you do ... look more closely at the ground beneath your feet?* START A ROCK COLLECTION / PAINT STONES / GO FOSSIL HUNTING / SIMPLY TAKE A WALK

The Earth is full of ... if we take the time to notice? WONDERS

Rocks may seem silent, but they hold epic tales of ancient ...?

VOLCANOES

OR: Rocks may seem silent, but they hold epic tales of...? ANCIENT VOLCANOES / DEEP OCEANS / SPACE TRAVEL / HUMAN BELIEF

How would you like to celebrate International Rock Day?

Touch the pink stone in the picture.

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Creative Writing:

Go outside and find a rock. Let it sit in your hand and look at it. Write a story about the life of this rock, where it comes from, where it has been and what it has seen.

Creative Writing:

Write a rock song about rocks.

Creative Writing:

Write a joke about a rock.

Extended VAKTivity:

Materials needed:

Rocks

Acrylic paints / acrylic markers

Paint brushes

Go out in nature and find a pebble or rock suited for painting. Using acrylic paints, paint to your liking or use one of the ideas in the picture of the painted rocks.

Or look at this website for more creative ideas:

<https://colormadehappy.com/best-painting-rocks-supplies-guide/>

Resources:

<https://www.usgs.gov/media/images/nyc-region-rock-cycle>

<https://geology.com/rocks/>

<https://www.nps.gov/subjects/geology/rocks-and-minerals.htm>

<https://science.nasa.gov/solar-system/meteors-meteorites/>

<https://www.nhm.ac.uk/discover/snakestones-ammonites-myth-magic-science.html>

<https://www.minerals-kingdom.com/stones-virtues/cinnabar-stone/>

<https://www.nps.gov/deva/planyourvisit/the-racetrack.htm>



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<https://www.smithsonianmag.com/smart-news/simulation-suggest-legendary-viking-sunstones-could-have-worked-180968710/>

<https://www.geologyin.com/2023/07/painite-rarest-gem-in-world.html>

<https://theweddingscoop.com/tanzanite/>

<https://www.daysoftheyear.com/days/international-rock-day/>

Pictures:

<https://pixabay.com/photos/ammonite-petrification-fossil-321695/>

<https://www.pexels.com/search/rocks/>