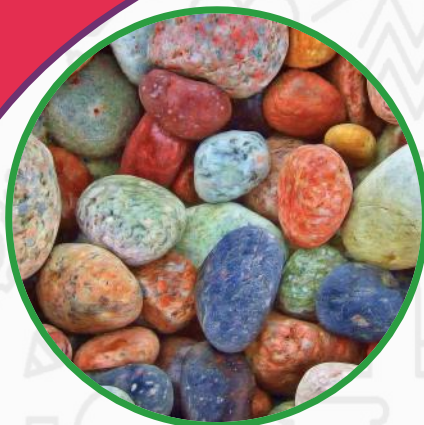


OpenUpScience

Issue 31



Welcome to
OpenUpScience,
the magazine from Cambridge
Science Centre.
In this issue, we're thinking
about rocks.

Find out more with the
fun activities and
puzzles inside!

Rocks Issue

Make the
different types of
rock – out of
starburst!

How high can you
build a rock
tower?

What is a rock's
favourite band?

Welcome to OpenUpScience

from Cambridge Science Centre.

This issue is all about Rocks. There is lots and lots of rock on our planet – in fact, most of our planet is made of rock! There are big rocks, small rocks, smooth rocks, rough rocks and more! Scientists who study rocks are called **geologists**.

If you look closely at sand,
you will see it's made of
loads of tiny, tiny rocks!



With so much rock and so many different kinds of rock, where do geologists even start?! Well, there are 3 main types of rock that are defined by how they were formed...

Marvin the Marble is hidden 9 times among the games, puzzles and experiments in this issue. Can you spot him?



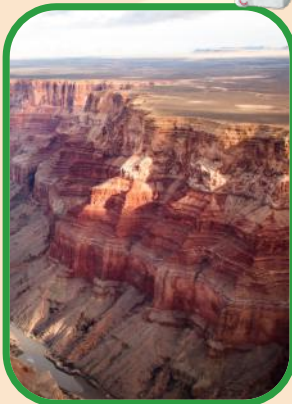
Spark, Ignite, Fuel, Illuminate

Sedimentary Starburst

How are sedimentary rocks formed? Discover by making your own – out of starburst!

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Sedimentary rocks are built up with layers of sediment that fall through the ocean and settle on the seabed. Sediment is made up of small bits of stuff - it can be made of small bits of other rocks, bits of minerals, mud, soil or bits of dead plants or animals. Over time the sediment forms layers on the seabed. As the layers build up, the layers below get squished and pushed down by the layers on top of it and eventually form a solid rock.



You only find fossils in sedimentary rocks because the remains of an animal or plant can get stuck in the layers!

What you'll need

- Starburst sweets
- Scissors

What to do

1. Wash your hands!
2. Pick out a few different colours of starburst and cut them into pieces. These will be the pieces of sediment.
3. Make layers of the different starburst into a tower.
4. Press down on top of the tower until all the starburst have stuck together to make one big sedimentary starburst.
5. Eat your sedimentary rock!



Metamorphic Starburst

But what about metamorphic rocks? How are they formed? Well, we can model that out of starburst too!

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What you'll need

- Starburst
- Scissors
- A sandwich bag



What to do

1. Wash your hands!
2. Pick out a few different colours of starburst and cut them into pieces. These will be the pieces of rock.
3. Put the pieces of starburst rock into the sandwich bag.
4. Squeeze the bag with your hands, applying heat and pressure, until the starburst bits mould into one big metamorphic starburst.



Metamorphic rocks are made of pieces of other rock (even bits of other metamorphic rock) and form deep inside the Earth's crust. The further down you dig into the Earth the hotter it gets, so down here the rock is really hot and has the weight of the Earth above squishing down on it. This means the rock is under very high pressure and temperature. This morphs and changes the bits of rock to make metamorphic rock.

Igneous Starburst

The third type of rock is igneous rock. How are they formed? Well, we can model this too with – you guessed it – more starburst!

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Our Earth is made of layers. Below the crust layer is the mantle layer. The mantle is made of super hot *liquid* rock called magma – or you might know it as lava! If there is a crack in the Earth's crust layer, this liquid rock can spectacularly erupt to the surface as a volcano. The liquid rock lava spews out, is cooled by the chilly surface temperatures, hardens and forms igneous rock.

What to do

1. Pick out a few different colours of starburst and cut them into pieces.
2. Put the pieces of rock into your dish.
Get an adult to help with the next step.
3. Put the dish into the microwave for 30 seconds. The starburst will heat up and melt like the lava.
4. Get an adult to take the dish out of the microwave. As the starburst cool down they will turn solid, forming one igneous starburst.

What you'll need

- Starburst
- Scissors
- An old microwave safe dish
- A helpful adult
- Microwave



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Rock-Star Guess Who

Play this classic game with a rocky twist!

Not all rocks look the same - they are made in different ways and of different things!

What you'll need

- A friend to play with
- A pencil
- Rock-Star Guess Who game board (next page)

What to do

1. Cut out both rock-star guess who game boards and give one to a friend.
2. Without letting your friend see your board, choose a rock in the table and put a star next to it.
3. Look closely at each rock and see what some of them have in common and how they are different. Alternate asking questions, youngest first, to your opponent about the rock they have chosen to try and figure out which one it is.
4. The winner is the person who guesses their opponents rock correctly first.

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Can you be a rock detective?

2 of the rocks are sedimentary, 2 are igneous and 2 are metamorphic. Can you figure out which are which?

CLUES

Sedimentary – Look grainy, are soft and sometimes you can see layers of sediment build up

Igneous – Some have scattered crystals and some have air bubbles from when the lava cooled

Metamorphic – Really strong, sometimes with streaks and lines bending across from when they were squished

Solution on the back page





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Cut me out!



Rockin' Puzzle

Answer the questions below to find out which letter pairs with which number. Use this to find out the answer to the age old question – what is a rock's favourite band?

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What is a rock's favourite band?

7	15	2		8	3	4	4	5	9	1

6	7	3	9	2	6

Its only rock and roll, but they like it!

What is the name of a scientist who studies rocks?

1	2	3	4	3	1	5	6	7

What is the name of the type of rock that is build of layers that fall through the ocean?

6	2	12	4	10	2	9	7	11	8	13

What is the name of the type of rock that forms under high pressure and temperature deep in the Earths crust?

10	2	7	11	10	3	8	14	15	5	16



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Solution on the back page

Rock balancing

How high can you make a tower of rocks?

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What to do

1. Lay out your selection of rocks.
2. See how tall you can stack them. Experiment with different rocks on the bottom and by putting the rocks different ways around – remember, no glue allowed!

What you'll need

- A selection of different sizes and shapes of rock
- An adult to supervise

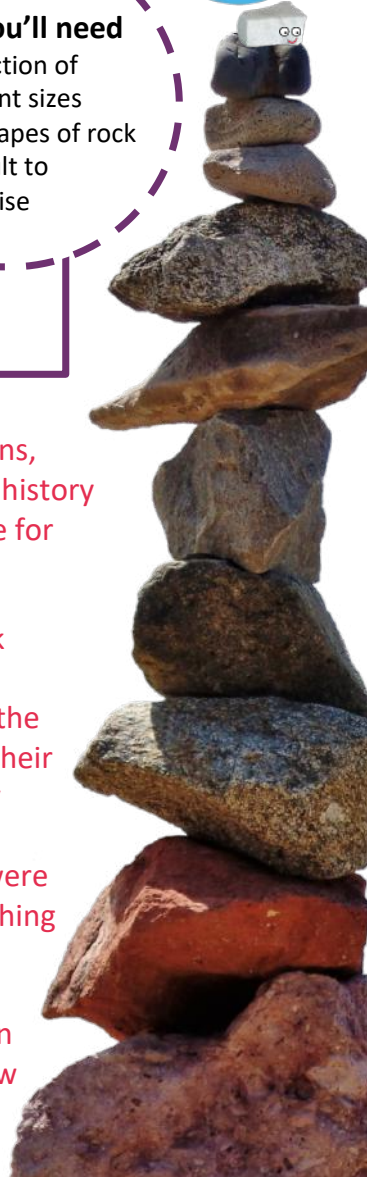


Rock towers, or rock cairns, have been used through history by many different people for lots of different reasons.

Some of the earliest rock towers were made by people, like the Inuit, in the

Arctic region of North America. They called their towers *inukshuk* (say “i-NOOK-shook”). They were used for finding their way in the snow where everything can look the same. They were also used for signposting good hunting or fishing spots and to mark sacred places.

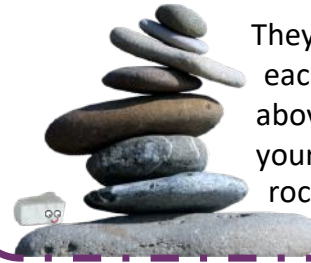
In Inuit tradition, it is forbidden to destroy an inukshuk and they can last for years! See how long your tower can last outside.



Building a rock tower

There is no glue or cement holding the rocks together, so how do they stay up?

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They stay up because they are balanced on each other - each stone supports the one above and below it. How stable, or strong, your tower is depends on the shape of the rock and how good you are at balancing.

How stable something is depends on how wide its base is.



So this will be much easier to stack on top of another rock...



...than this!!

Test this at home...

Stand with your feet wide apart. Get a friend to give you a gentle nudge.

Now try standing on one leg and get your friend to give another gentle nudge. Can you feel the difference?



Puzzle solutions

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What is a rock's favourite band?

T	H	E		R	O	L	L	I	N	G
7	15	2		8	3	4	4	5	9	1

S	T	O	N	E	S
6	7	3	9	2	6



Diorite
IGNEOUS



Slate
METAMORPHIC



Marble
METAMORPHIC



Chalk
SEDIMENTARY



Sandstone
SEDIMENTARY



Pumice
IGNEOUS

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Spark,
Ignite,
Fuel,
Illuminate

Tell us what you think!
We always want to improve, so
let us know what you liked – or
didn't like – about this issue!



Email us your pictures and
questions

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is all about empowering children
and young people to discover
science for themselves through
hands-on activities. While the centre
isn't open as normal at the moment,
we are happy to say that we will be
opening for May half term!
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website for more
information and
to book.



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