



The beauty of maths

for first & second level (ages 6-12)



Notes for the group leader

This resource offers 6 prompts to inspire learning about maths, through art:

- Tessellation*
- Scale*
- Favourite numbers*
- Describing shape
- Symmetry
- Pattern

Resources can be used in school, or in Modern One art gallery in Edinburgh. You can select the tasks that best suit your learners, try them in any order and adapt to suit. Questions and tasks are deliberately open-ended to encourage learners to problem solve and think for themselves.

There is no right or wrong way to see art – we all see things differently. We would encourage learners to make their own associations between the artworks and their own lived experience, people, places and objects familiar to them.

Each activity features

- a picture of an artwork
- information about the artist
- discussion prompts
- a maths/ art related activity

* At the time of writing, the artworks linked to these activities are on display at Modern One.

This resource supports a range of Experiences and Outcomes, in line with the Scottish Curriculum for Excellence

Numeracy and Mathematics

I can explore and discuss how and why different shapes fit together and create a tiling pattern with them. MTH 1-16b

I have explored symmetry in my own and the wider environment and can create and recognise symmetrical pictures, patterns and shapes. MTH 1-19a

I can illustrate the lines of symmetry for a range of 2D shapes and apply my understanding to create and complete symmetrical pictures and patterns. MTH 2-19a

Art and Design

Inspired by a range of stimuli, I can express and communicate my ideas, thoughts and feelings through activities within art and design. EXA 1-05a / EXA 2-05a

I can respond to the work of artists and designers by discussing my thoughts and feelings. I can give and accept constructive comment on my own and others' work. EXA 1-07a / EXA 2-07a

I have the opportunity to choose and explore a range of media and technologies to create images and objects, discovering their effects and suitability for specific tasks. EXA 1-02a

I have the opportunity to choose and explore an extended range of media and technologies to create images and objects, comparing and combining them for specific tasks. EXA 2-02a

I can create and present work using the visual elements of line, shape, form, colour, tone, pattern and texture. EXA 1-03a

I can create and present work that shows developing skill in using the visual elements and concepts. EXA 2-03a



These artworks are from the National Galleries of Scotland collection.

Do you think they are beautiful?
Which one is most / least beautiful? Why?
Does everybody in your group agree?
Is maths beautiful?
Can you find any maths in these artworks?





Tessellation

Jann Haworth,
Old Lady II



Take a good look at this sculpture.

What do you notice?

Does this person remind you of anyone or anything?

What questions would you ask this person if they could speak?

What stories do you think she could tell us?



Look closely at the 2 blankets in the sculpture.

Describe all the shapes.

What kind of shapes fit together (ie tessellate) to make a flat blanket?

Which don't?

Why?

What's the difference between a diamond and a rhombus?

Jann Haworth was born in 1942 and grew up in Hollywood.



Films made in Hollywood at that time rarely showed older women but Jann wanted to celebrate older women in her art.

About the artist...

This sculpture is based on a photograph of her great-grandmother.

Create your own blanket/
textile/ clothing/ pattern
by joining together shapes
you have
found or cut
out.



Now it's
your turn...

Share your art
with the world...
[Click here](#) and follow
the link for 'share
your art'.
You'll find lots of
other inspiration for
art making there too!



Now it's
your turn...

Scale



Rene Magritte,
La Légende
des siècles
[The Legend
of the Centuries]

Look closely at the image on the next slide for 9 seconds only.
Try to remember everything you see...



What do you
remember
about the
picture?

What was
unusual
about it?

Talk
about it...

Now have another look.

What didn't you
remember?



Talk
about it...

What
questions
would
you ask
the artist?

Rene Magritte was a Surrealist artist who painted everyday objects in unexpected ways.

The Surrealists wanted to show things that can't usually be seen. Sometimes they painted their dreams or tried other ways to show thoughts from their unconscious mind.

About the artist...



Magritte changed the scale of objects, and played with perspective to create scenes that wouldn't exist in the real world.

What would it be like to
be tiny like a bee?
Make an artwork to
show your ideas.



Now it's
your turn...

Find out
more about
this Challenge,
set by children at
Greengables
Nursery

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Favourite numbers

Barbara Hepworth,
Conversation
with magic stones



Take a good look at this outdoor sculpture.

What do you notice?

The title of this artwork is 'Conversation with magic stones'. Who do you think is having the conversation with the magic stones?

What magic powers do you think the stones might have?

What do you think they are talking about?

The number 3 often pops up in Barbara Hepworth's work. She gave birth to triplets in 1934.



Each stone is decorated differently, with circles or textures.

Hepworth lived in St Ives, Cornwall, and the prehistoric standing stones in the area may have inspired her.

Compare the prehistoric stones with Barbara's stones. How are they similar / different?

About the artist...

Hepworth called the 3 vertical parts 'figures' and the 3 low parts 'magic stones'.



The magic stones are identical eight-faced polyhedrons, although it is difficult to tell this from the way they are positioned.

About the artist...

Does the artwork remind you of anything you've seen before?



What is a polygon?

What is a polyhedron?

What's an 8-sided polygon called?

What's an 8-faced polyhedron called?

Which part is the face, the edge, the vertex?

Find examples and make your own.

Make something inspired
by the number 3
or
by your favourite
number.



You might start with 3
paint splashes, 3 dots,
or 3 bits of card.

What could
they become?

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your turn...



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Describing shape

Sol Lewitt,
Wall drawing
#1136

We're going to look at a drawing by an American artist called Sol.

Work in pairs A & B.

You'll need paper and colour pencils or crayons.

A: sit with your back to the screen so you can't see the slides.

B: describe the artwork on the next slide.

A: draw what you hear described by your partner.





How is your drawing
different from Sol's
drawing?

What words and
phrases could help
you recreate his
drawing more
accurately?

B, was it easy
to describe?

A, was it easy to
follow the instructions?

**Talk
about it...**



How does the drawing make you feel?

What do you notice in the artwork?

Talk
about it...

Does it remind you of anything?



Sol came up with ideas for lots of wall drawings.

Sol didn't use canvas or paper – his ideas were painted straight onto the wall.

Sol had to write careful instructions so that galleries around the world could recreate his drawings exactly as he wanted them to look on the gallery wall.

About the artist...



Words you might include:
enlarge, rotate,
repeat,
tear, cut, fold.

Words you might include:
curved, straight,
vertical, horizontal,
symmetry.

Try creating instructions for your very own drawing.

Now it's
your turn...

Swap instructions with a partner and have a go at making their drawing. Compare the original and the new creation. Could the instructions be clearer?



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Symmetry

Ron Mueck,
Mask III



Take a good look at this sculpture and chat with a partner...

What do you notice?

What do you think are its measurements?

What's it made of?

Is it symmetrical?

Australian artist Ron Mueck makes sculptures of people. He changes the scale to make people look tiny or huge.

Ron's sculptures are so lifelike it's hard to believe they're made of traditional art materials, usually mixed media. He was inspired by looking at sculptures of Buddha.



About
the artist...



This
sculpture
measures
155 x 132 x
113 cm

Ron once
made a giant baby
that was over 5m
long.

What's the
largest
thing you've
ever made?

About the artist...

What would you look like if your face was exactly symmetrical?

Experiment with mirrors, cameras, photocopies /photoshop to make your face look the same on both sides. What if the line of symmetry was horizontal?



Now it's
your turn...



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making there too!

Pattern

Yinka Shonibare,
Sun, Sea and Sand



Take a good look at the image on the next slide.

What do you notice?

How many different patterns can you see?

What do you think it's made of?

What does it make you think or wonder?



Yinka Shonibare
was born in London to
Nigerian parents.

He makes
art about the
differences between
Nigerian and British
culture.

About
the artist...



This artwork is an installation made of 1000 fabric-covered polystyrene bowls.

This kind of brightly coloured fabric is associated with Africa but it was actually imported to Africa from Europe.

The bowls are empty to represent famine and poverty and they are laid out the way African traders sometimes lay out goods for sale.

The blue floor represents the sea, maybe reminding us of luxurious foreign holidays.

About the artist...



How many different patterns can you find around you, at home or at school?

Try mixing different patterns together to make your own new patterns.

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Image credits

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Barbara Hepworth, *Conversation with magic stones*, 1973 © Bowness for works by Barbara Hepworth

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