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?
Tesselation

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

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

Now it’s your turn...
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!
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...
Talk about it…

What do you remember about the picture?

What was unusual 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.

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

About the artist...
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.
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!
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.

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

Each stone is decorated differently, with circles or textures.

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.
Now it’s your turn…

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?
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...
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.
Talk about it…

A, was it easy to follow the instructions?

B, was it easy to describe?

How is your drawing different from Sol’s drawing?

What words and phrases could help you recreate his drawing more accurately?
How does the drawing make you feel?

What do you notice in the artwork?

Does it remind you of anything?
About the artist…

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.
Now it’s your turn…

Try creating instructions for your very own drawing.

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

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?

Words you might include: enlarge, rotate, repeat, tear, cut, fold.
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!
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?
About the artist...

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?
Now it’s your turn...

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...

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!
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...
Now it's your turn...

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.
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!
Image credits

Jann Haworth, *Old Lady II*, 1967 © Jann Haworth


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


Special thanks to