Notes for the group leader:

The aim of this resource is to start a conversation about maths ideas and art. We hope to ignite an interest and understanding of maths principles that will excite a child to question, experiment and appreciate the relevance of maths in everyday activities and engage in the language of maths and art.

There are 6 activities, each related to a different artwork and aspect of ‘maths in motion’.

At the time of writing, all the artworks are on display at Modern One and Modern Two galleries in Edinburgh. We hope you might make a visit to experience the art for yourselves.

Prompts and activities are deliberately open ended to encourage children to problem solve and use their own experiences and imaginations to play and extend the suggested activities.
Maths in motion
For early level
(Typically 3-6 years)
Moving makes a mark

Look carefully at the picture.

What does it look like to you?
(There are no wrong answers.)
Can you see any shapes or numbers?

How do you think it was made?
Moving makes a mark

This was made by artist Alan Davie. First, he tried to empty his mind, then he let his hand move as it wished over the paper. He liked to dip a stick in ink and use it like a brush.
Now it’s your turn

You will need:
• big paper
• tape
• crayons, pencils, or felt pen dabblers
• or an interactive screen
Hold your crayon over the paper.
Close your eyes and take a deep breath in and out.
Empty your mind.
Keep your eyes closed. Feel the edges of your paper.
Move your crayon anywhere it wants to go on the paper.
Move it fast. Move it slow.
Open your eyes. How many different moves, marks and shapes have you made?
Can you see any numbers or shapes in your picture?
Balance

Take a good look at this picture.

What is the person doing?

What do you think the shapes below them look like? (e.g. roof tops, bridges, numbers, music notes?)
Balance

Paul Klee made this picture called Tightrope Walker.

He lived during a difficult time of war.

He thought living in his world was a bit like walking on a tightrope.

He was interested in gravity. This is a force all around us. It’s like a magic cloak, we can’t see, hear or touch it but it keeps us glued to the earth.
Balance

Imagine you are walking on a tightrope.

How does it feel?
Are you moving fast or slow?

Do you like being up high?

Have you ever been in a plane, rollercoaster or skyscraper?
Now it’s your turn

Activity 1

Make the tallest tower you can by balancing found objects one on top of the other.

How many objects can you balance before it falls down?
Which objects balance best on top of each other? What do you notice about their shape and size?

Are you able to balance something very light (like a feather or a cotton wool ball) at the top of your tower?

Can you change your tower to make it taller? Does your object still balance on the top?
Activity 2

Push or roll 4 objects off the top of your tower.

Guess what will fall slowly and quickly.
Count how many seconds each object takes to fall.

Extend: fill balloons with water and dip them in paint. Drop from different heights. Notice the different marks made.
Travelling

Can you spot the people in this painting?
What do you think the curved shapes are?
How many straight lines can you see? What are they?
Clue: the title of this painting is “Misty Morning”.

NATIONAL GALLERIES OF SCOTLAND LEARN
Travelling

The straight lines could be car headlights, driving up a windy road.

We can see 2 people in the lorry, bottom right.
Travelling

The artist Roger Brown loved going on long road trips across America and looking at the landscape.

What’s the longest trip you’ve been on?

He also loved comic books and patterns. Can you spot any patterns around you?
Now it’s your turn

You will need:
- different objects which can roll (e.g. a ball, cotton reel, ball of string, toy wheel, cylinder)
- a tray lined with paper
- different colours of paint in dipping trays
Dip the objects in paint and roll them around the paper.

How can you make them roll faster and slower?

What do you notice about the patterns they make on the paper?

Do you notice any colours mixing together?
Moving objects

Take a good look at this sculpture.

Can you guess which parts of it move?

What do you think makes them move?
Moving objects

The 2 lines at the top move in the wind.

Do you think the 2 lines could crash into each other when they move?

What do the lines point to?
Moving objects

The artist George Rickey fixed machines and aircraft during World War II.

He was interested in how everyday shapes look different when they move, as if they’re dancing.
Now it’s your turn

Collect natural objects e.g. sticks, leaves, stones.

How can you make them move?

Can you tie sticks together?

Can you thread leaves onto a stick so they move in the wind?
Dance shapes

Henri Matisse was a very famous French painter. He loved colour, shapes, travel and jazz music!

Which one of his pictures do you like best? Which one has the most exciting shapes? Can you draw them?
Dance shapes

Henri was inspired by jazz music to make these pictures.

Listen to some jazz

How would you describe jazz?
Now it’s your turn

Activity 1

Can you dance like the person in this picture?

Choose 3 shapes from the picture. Make the shapes into movements using your body.

Repeat to create your own dance routine.
Activity 2

Pretend you are Henri Matisse by making your own picture while listening to jazz music.

Cut or tear coloured paper to make different shapes.

Can you make the shapes dance?
Slow movement

Slow movement is the title of this painting by Eileen Agar.

Take a good look at it.

What do you see? (eg the sea, a person, butterfly, pattern, circles?)
Slow movement

Eileen was inspired by the sea, nature, dance, movement and circles.

How many curves and circles can you see?
Slow movement

Was the picture the same on both sides?
Slow movement

The picture is not quite the same on both sides.

Can you spot the differences?
Now it’s your turn

You will need:

• paper folded in half, opened out and taped down
• 2 oil pastels or pens of the same colour
Hold one pen in each hand.

Start with both hands at the fold in the middle of your paper.

Move your hands away from each other. Try to make the same shapes with both hands.

Try and use up all the space on the paper.
Is your drawing symmetrical? (Does it look the same on both sides?)

Do the same again but start at the bottom of the page this time.

Add paint or tissue paper, overlap and mix colours.
Image credits:

1. Alan Davie, Untitled [Opus D.616], 1953 © The Estate of Alan Davie. All Rights Reserved. DACS, London 2022

2. Paul Klee, Tightrope walker, 1923 Creative Commons CC by NC

3. Roger Brown, Misty morning, 1975 © The School of the Art Institute of Chicago and the Brown family

4. George Rickey, Two lines up Excentric VI, 1977 © Estate of George Rickey. All rights reserved. Artists' Right Society (ARS), New York and DACS, London 2022.


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

MNU 0-01a I am developing a sense of size and amount by observing, exploring, using and communicating with others about things in the world around me.

MNU 0-03a I use practical materials and can ‘count on’ and ‘back’ to help me to understand addition and subtraction, recording my ideas and solutions in different ways.

MTH 0-13a I have spotted and explored patterns in my own and the wider environment and can copy and continue these and create my own patterns.

MTH 0-16a I enjoy investigating objects and shapes and can sort, describe and be creative with them.

MTH 0-19a I have had fun creating a range of symmetrical pictures and patterns using a range of media.

SCN 0-07a Through everyday experiences and play with a variety of toys and other objects, I can recognise simple types of forces and describe their effects.

EXA 0-02a I have the freedom to discover and choose ways to create images and objects using a variety of materials.

EXA 0-05a Inspired by a range of stimuli, I can express and communicate my ideas, thoughts and feelings through activities within art and design.

EXA 0-07a 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.
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