Teachers’ Learning Resource

Beauty is the First Test: an exhibition exploring Maths & Craft

For the duration of the exhibition ‘Beauty is the First Test’ we are welcoming schools and groups to visit the gallery.

We are delighted to be able to offer:
- exhibition tours
- use of our project room

The Exhibition ‘Beauty is the First Test’ explores craft and mathematics. It shows how important mathematics is to contemporary craft practice. The artists in the exhibition use a range of materials in their work from textiles and wood to ink and bronze. Mathematics underpins the artists' practice as they explore constructed textiles, geometric shapes, sequence, pattern and repetition. Craft practice requires precision with specific sizes, shapes, measurements and percentages.

In this learning pack we have identified key discussion points from a selection of the artworks on display and suggest activities that can be done either at the gallery or in the classroom.

MICHAEL BRENNAND-WOOD
Michael Brennand-Wood uses textiles, wood, drawing and other materials and techniques to make complex collections of shapes that are both two- and three-dimensional. He often uses computerised embroidery to make shapes, just like the embroidered names and logos on school shirts and jerseys.
www.brennand-wood.com

Gallery Activities/ Discussion:

Look at artwork “Wasn’t Born to Follow” (above).

Can you see a pattern in this work?
Can you draw it?

What’s the same and what’s different from one part of the work to another?

Pick one part of the pattern you like and re-draw it by itself. How could you make it continue? Try drawing the continuation in a different colour.

**In the Classroom:**

**Explore symmetry:** Print an image of the work with a line drawn down the middle - play a simple game of spot the difference

**Exploring rotational symmetry:** Draw or cut out a detail of the work - can this be rotated?

**Exploring pattern/repeat pattern:** Draw a pattern or repeat pattern or continue a pattern(s) on the worksheet. Ask the group to make a shape using their bodies and create a repeat pattern (circle, rectangle, square, circle, rectangle, square) / (loop arms, stand like a soldier, crouch down, loop arms, stand like a soldier, crouch down). Use bottle tops, artificial flowers, lollypop sticks, buttons and beads to create group patterns)

This work demonstrates rotational symmetry, but it is not completely symmetrical. Encourage pupils to use different coloured felt pens to explore the shapes and identify repeat patterns. Grid paper may help to explore growth patterns.

An exercise for discussion could be to ask the group “What could you do to make it completely symmetrical? What would change and what would stay the same?”

**LESLEY HALLIWELL**

This artist uses geometric drawing tools known as Spirographs and lots of different coloured inks to draw her works on paper. The shapes in her work are examples of tessellations, but if you look closely you will see that the works are not perfectly symmetrical as
she draws by hand with just a few pencil lines to guide the overall structure. www.lesleyhalliwell.co.uk

Lesley demonstrated her technique in James May’s BBC2 programme “My Sister’s Top Toys” www.youtube.com/watch?v=o3lKhdwoytQ

**Gallery Activities/ Discussion:**

*What kinds of shapes can you see in her work “Beauty is the First Test” (see previous page)?*

Explore tessellation:
Using pre-cut shapes from the resource bag create group tessellations on the floor. Draw around pre-cut shapes to create a group tessellation on paper.

**In the Classroom:**

Make simple templates in card of these shapes - circle, hexagon, pentagon, triangles. Drawing around them, how could they be repeated to make new patterns?

**ANN SUTTON**
Ann Sutton is a textile artist and weaver who is interested in sequences and repetition.

**Gallery Activities/ Discussion:**

*Look at artwork “Four Ways From a Square” (above).*

*Can you describe what happens as you go down each row?*
Could you draw it?

What do you think the next column would look like? Draw it too.

**In the Classroom:**

The activity can be extended in the classroom by exploring colour mixing, measurements and 2D shapes. The work could be further extended through textiles or felt making. It could even become a wall hanging with pockets for storage, counting or numbers.

For discussion: What does this artwork remind you of and why? (The 100-square is a good answer!)

Look at “Spectrums Emerging”, this artist’s work on dark backgrounds (shown opposite). The individual pieces explore colour ratios, in different mixtures of colour through the warp (threads running vertically) and weft (threads running horizontally).

Try to create the same effects using paint on paper.

Watch this short extract from an interview about her career where Ann Sutton describes the moment in her childhood when how she got her early interest in stripes and squares: http://www.youtube.com/watch?v=R0tIRs-XjnY
LAURA THOMAS
This artist is also a weaver but she is interested in making works that are not about the usual squares and rectangles of most weaving, or are presented just as panels of 2D cloth. She explores processes including innovative work cast in acrylic forms, which can be curved into other sculptural shapes.
www.laurathomas.co.uk

Gallery Activities/Discussion:
Look at artwork “Three by Five” (see opposite).

Which way do the lines run in this work?

Can you draw the lines?

What different shapes can you see?

What properties do they have?

In the Classroom:
Can you draw one or more of these shapes and then colour them in to match the artwork? What happens if you take these shapes and try to put them together in a different way? What happens if you use different colours?

For discussion: Why do you think she called it ‘Three by Five’? (The answer is that there are three pale hexagons going down each side, and five across, but the latter are not in a straight line, which may be confusing for some).
Lucy McMullen is a weaver, and a teacher at the University of Ulster. Her work is characterised by the use of completely plain weave, but very complex layers as she weaves two or three layers of cloth simultaneously.

**Gallery Activities/ Discussion:**

Look carefully at Lucy McMullen’s work “Maelstrom” (see above). It is made of lengths of striped cloth woven together.

*Can you identify how many different lengths of cloth she used?* (A clue: each one is in a different group of colours).

*Can you draw this work, with a different colour for each length of cloth?*

**In the Classroom:**

The *standard weave* ‘structure’ used by Lucy McMullen (and by Ann Sutton in some of her work) is ‘tabby’ which is a straightforward alternation of threads in both warp and weft:

The structure can be easily learnt through *experiment* with strips of paper or fabric. Use of two colours makes the structure easier to understand.

Pupils will find it easier to make these experiments if the strips of paper are fastened down at one end,
perhaps with tape or staples; or if, as in the sample, one set of strips is not cut all the way through (this was pre-cut using a guillotine).

Variation from the alternates of 1-2-1-2 will create entirely different effects. If the ‘weft’ strip (in gold) goes under two ‘warp’ threads (in blue) and then over the third, this is known as ‘2/1 Twill’, more commonly recognisable as Denim. The image on the right shows the reverse of the same sample, and this is known as ‘1/2 Twill’. Experiment! Three colours or more will produce different results altogether.

Discussions could be extended in the classroom by exploring the work of Lucy McMullen further with questions such as - what material is it made from? what does it remind you of?

PETER RANDALL PAGE
Peter Randall Page is a sculptor and fine artist who works in a variety of materials such as stone and bronze, as well as drawings and prints. He often creates works that explore the mathematical patterns and geometry that can be seen in natural forms.
www.peterrandall-page.com

Gallery Activities/ Discussion:

Look at sculpture ‘Maquette for Seed’ (pictured above). What shape is it?

The surface is covered in rows of little knobs. Can you describe which ways they go?
How does the size of the knobs relate to the shape of the object?

What would it feel like to touch?

What does it remind you of?

The students could interview the artwork in pairs (one being the artwork and one being the interviewer). They could ask questions such as - what is your favourite colour, how were you made? What are you?

In the Classroom:
The activity could be extended in the classroom by collecting natural materials which can then be measured, weighed and arranged in order of height, length and weight.

Additional Artists:
The other artists in the exhibition are:

Suresh Dutt www.sureshdutt.net
Suresh is a sculptor, working with geometric forms that are often also optical illusions, as he plays with the gaps between the real and imaginary.

Janice Gunner www.janicegunner.co.uk
Janice is a quilter and teacher, renowned for her mastery of Japanese shibori, a complex pleating and dyeing technique. Her work in the exhibition uses fabric she designed and printed herself using images of Fibonacci sequences developed by French mathematician Francesco de Comite of Lyon University.

Janette Matthews www.janettematthews.com
Janette is a textile artist using laser-cutting and folding to create fabric panels that explore optical effect and illusion. She has a background as a software developer and teacher, and is currently based at Loughborough University.

Additional Gallery activities:
Ask students to sit in pairs back to back (one facing the artwork and one facing away). The student facing the artwork should describe it in detail to their partner who should draw based on the description. This will help with literacy and numeracy, especially when describing properties of shapes.

Walk around the exhibition and write which artwork you think is:
• The strangest looking.
• The best looking.
• The object you would most like to take home.

Back in the Classroom:

For discussion - share answers to above prompts and can you say why you gave these answers?

Create your own versions of your favourite artwork (either matching in form, pattern or ideas) and hang an exhibition.

Compare your class’s exhibition with the one that was on at the gallery.

Learning resource developed by Pump House Gallery, Liz Cooper and Kathy Schicker, in partnership with Wandsworth Children’s Services and The National Centre for Craft & Design.