



NATURE'S NUMBERS

OVERVIEW: Math is everywhere in Nature: the pattern of spots on your dog, the delicate symmetry of butterfly wings, the shape of crystals in salt all evidence some of the mathematical properties of nature. "Nature's Numbers" provides opportunities for play with math and nature. The exhibit is divided into four themes: Repeating Patterns explores patterns found in nature, Basic Shapes and Structures offers opportunities for children to discover and become familiar with shapes found in nature. Designs In Nature relates natural formations specifically to math. And finally, by asking visitors to solve nature's puzzles, we create a natural foundation for mathematical inquiry.



INTERACTIVES



Shape Wheel



REPEATING PATTERNS

Circle of Symmetry

Where are the patterns in a butterfly's wing? Rotate a patterned disc mounted to a butterfly's wing and see the patterns align and mix.

Repeating Patterns

What is special about the symmetry of a snowflake? "Koch's" snowflake is based on fractals – geometric shapes that repeatedly subdivide, each becoming a smaller copy of the whole. Experiment with making your own fractal snowflake.

Spiro graph

Like the toy we all used as children, see if you can make a repeating pattern that looks like one you may see in a flower or another part of nature.

Wild Weather

If you start two pendulums in the same place they will start to swing in the same way but quickly have diverging patterns. Weather works in the same way and is therefore hard to predict.

Covering a Square

Do you see the pattern of halves? The largest piece fills half the square, the second largest covers half as much as the first and so on. No matter how many times you add pieces that are half the size of the previous one, you will never cover the entire square.

SHAPES AND SIZES

Rainbows of Light

A table top with prisms and light allow visitors to explore the properties of light and color.

Shape Wheel

Are all these shapes the same size? Turn the wheel and make the beads flow from one shape to another — they may appear to be different at first, but they all have the same area.

Touch Bumps

Nature's patterns are not only seen, they can be felt too – close your eyes and touch the different textured patterns.

Tanagram Zoo

A classic puzzle, that allows people to create something beautiful out of simple shapes. This puzzle is similar to two dimensional origami. Assembled, the puzzles make silhouettes of animals.

Section

A long block of wood is made up of only rectangles and squares, correct? Looking at cross sections, visitors find shapes they never expected to find.



Wild Weather



Kiddie Kaleidoscope

DESIGNS IN NATURE

Logarithmic Spiral

Can you replicate the pattern found in a shell (nautilus). Many things in nature follow a similar logarithmic spiral.

Kiddie Kaleidoscope

Children play with colorful pieces of nature seeing the reflections of these shapes and themselves, like a Kaleidoscope.

Rosette Kaleidoscope

A pattern is a pattern is a pattern. . .or is it? By opening and closing two mirrors that are reflecting an image of a natural object, visitors change the reflected patterns they see.

Balancing Act

Five wooden blocks are assembled into an overhanging series of cantilevers, which results in the uppermost piece completely outside of the shelf on which the blocks are assembled.

Voussoir Arch

Gravity is a force that lends to the way nature builds an arch. Visitors use keystone shaped blocks and gravity to make their own arch.

Reflections

Symmetrical patterns are everywhere in the natural world. Visitors make reflections of their hand in a kaleidoscope showing new patterns with three fingers or ten fingers on one hand.



Rosetta Kaleidoscope

MATHEMATICAL INQUIRY

Question Du Lapin

A classic puzzle of 5 octagons with cutout silhouettes of animals. When these pieces are placed on top of one another in the right orientation, the shape of a rabbit silhouette can be seen in the assembled negative space.

Tetrahedron Topple

What do you get when you combine four tetrahedrons and two pyramids? Visitors find out by putting the pieces together for themselves.

Cubism

A traditional puzzle where visitors make a large cube from seven pieces made up of smaller cubes. Seems easy and surprisingly there are a number of ways it can be accomplished.

Towers of Hanoi

A classic puzzle with seven disks each of smaller size and three poles. Visitors must follow the precise rules to move the complete stack from one pole to another.

Leafy Pieces

A classic complicated 3-D jigsaw puzzle of a leaf.



Leafy Pieces