

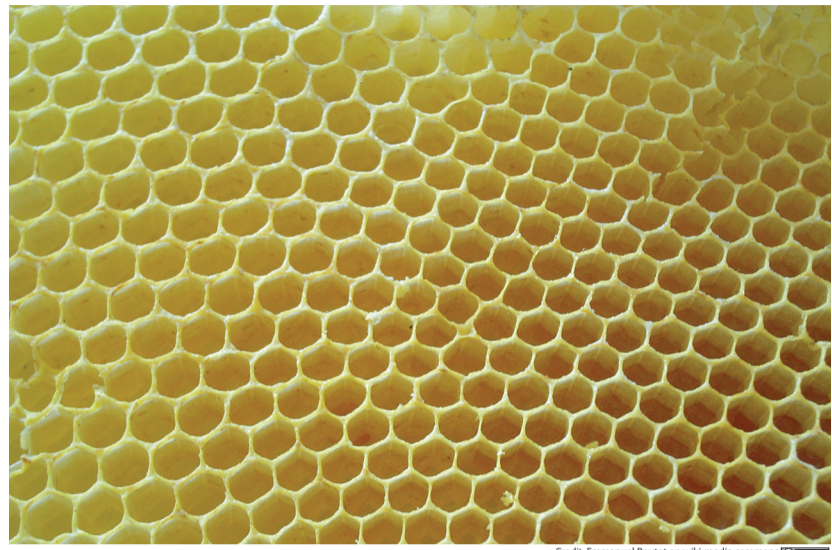


Where do we start?

From ancient times people have been putting shapes together, both for practical purposes and for decoration. They also appear in many ways in the natural world.



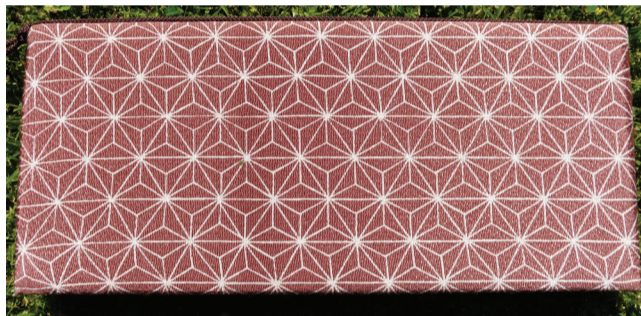
Stone Walling
Great Malvern, England



Honeycomb
Black Bee Hive, France



Fairisle Jumpers
Fairisle, Scotland



Fabric Design
Kanazawa, Japan



Church Tiling
Cuiabá, Mato Grosso, Brazil

Tilings and shapes have been part of mathematics since its birth, appearing in *Euclid's Elements* (c 300 BC) the earliest known maths book. Mathematics aims to understand the underlying rules that govern and limit things. Two key tools for this are:

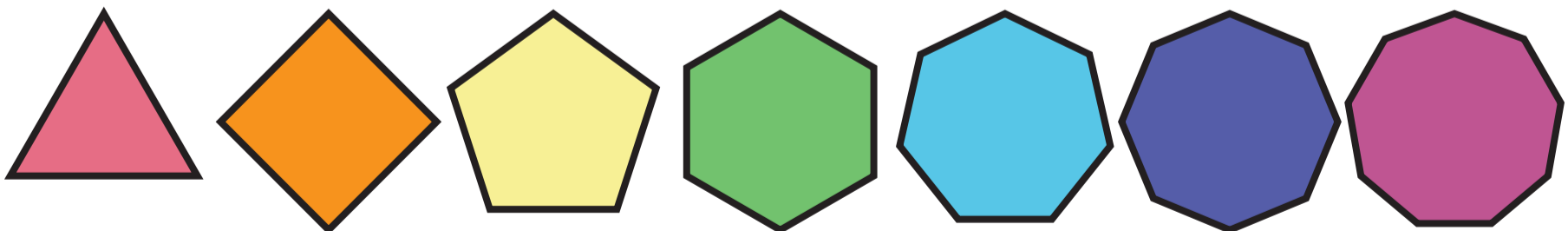
Classification: can we list all possible objects?

Generalisation: can we take my understanding of a specific case and apply it to a wider setting?

Can we classify all tilings? Even on the plane this is too difficult, let's simplify it by restricting the set of shapes. Can you tell which of the regular shapes below can fill the plane? We can generalise this to other tilings of the plane, but also to higher dimensions. We can even generalise 'space' and classify possible 'spaces' which shapes could fill.



Roman Mosaic
Domus dell'Ortaglia, Brescia, Italy



In this exhibit we look at ways shapes fit or don't fit together. Starting with simple shapes, we trace some of the ways they have been used in art and mathematics throughout history, and look at the problems and ideas that have arisen. This leads to current research problems in mathematics, and their consequences for science.

SELECTED 2009 THE ROYAL SOCIETY SUMMER SCIENCE EXHIBITION

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