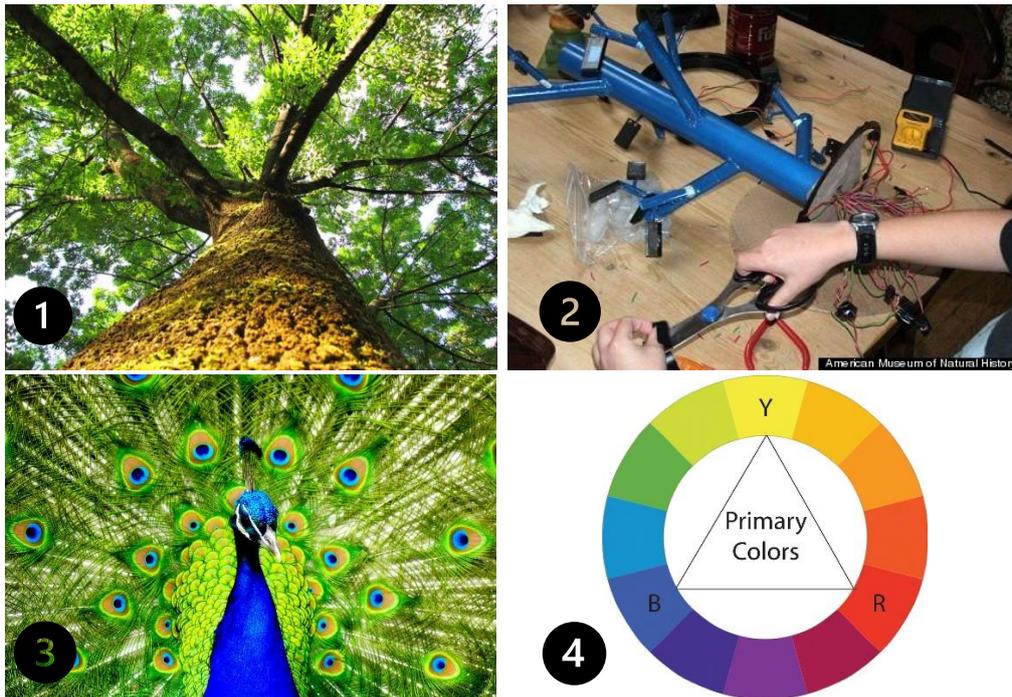


Good News Friday Edition 13 – Can We Mimic Nature?



BIOMIMICRY

Life has been on earth for more than 3 billion years. Templates, designs, engineering, technology and systems developed over this time for life to prosper in every corner of the world under every climatic conditions. Plants, insects and animals supported by biology have become specialists in their environments from the depths of the oceans to the highest mountains and they know what works – tested in real life conditions for millions of years. Rather than try to reinvent the wheel, why not use nature as a template for our future civilisations so we integrate our life with the earths living systems on which our life depends – possible or not?

A new approach to solving problems is Biomimicry. Biomimicry is the science of applying nature-inspired designs in human engineering and invention to solve human problems by literally copying nature.

It was used to create the first flying machine, inspired by eagles and owls and was also used in the well-known invention of Velcro, which works in much the same way as the hooks on burrs that stick to animal fur. It has now entered a new era of advancement to meet the challenges of today.

A great example is Aiden Dywer who at 13 years old took inspiration from the arrangements of tree branches to develop a new approach to collecting sunlight energy for solar panels (Image 2). Whilst on a hiking holiday he started observing the different ways tree branches grow.

He took pictures of the branches of different trees & he noticed the branches grew in a spiral pattern as they went up the trunk. He wondered if there was a formula behind the pattern of tree branches and discovered it followed a

mathematically pattern called the fibonacci sequence. He built test models to investigate how trees collected sunlight based on the oak tree pattern, replacing the leaves at the end of the branches with solar panels (Image 1). The oak tree branch pattern has five branches spiralling around the trunk twice to reach the same starting position as it goes up the tree.

He compared the number of leaf solar panels to ones arranged in a flat rectangle as they would be on a roof. The results were impressive with up to 20% more energy and 2.5 hours of sunlight charging compared to the regular roof arrangement. The greatest result was around the shortest day of the year with a 50% increase in sunlight charging hours. He compared the ability of tree leaves to catch sunlight to a human made flat-panel solar collector and Nature won.

[Aidan Dwyer: Better solar designs - Bing video](#)

We have all admired the pattern and iridescent colours of the peacock (image 3) Something that I only learnt recently is that the beautiful blue and green colours in the feathers are built on a layer of brown pigment. We find brown colour and pigments everywhere in nature and it is composed of all three primary colours (red, yellow, blue image 4) What is interesting is due to the micro-structure of the feathers it causes light to bounce in out of the structure in such a way that it produces the glossy and shimmery blues and greens. The structure is carefully laid out close together like thousands of micro hairs. It is literally a trick of the light like we see with rainbows but this time with structure not water droplets. Pigments used in our industrial world often use very toxic elements. Now scientists are experimenting with structure to produce colours for things like cars using textured micro coatings of benign substances. The future world through this lens looks bright, colourful and safe.