

Beautiful Butterflies

Standing out from the crowd helps butterflies find a mate of the same species. For example, the wings of the Morpho butterfly are covered in shades of shimmering blue. But how can butterflies produce such striking colours?



The answer is **structural colour**.

Most of us think of colour as a result of pigments. However, very small structures that we cannot see with our eyes (called nanostructures) can scatter light and result in a phenomenon called structural colour. These colours can shift and change depending on the angle you look at them.

The Morpho butterfly's wings are covered in microscopic ridges, cross ribs, and other structures which scatter light. This results in the iridescent blue colour which seems to change shade as you or the butterfly moves.

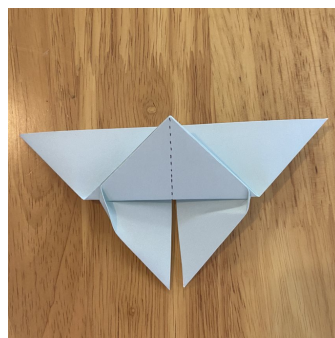
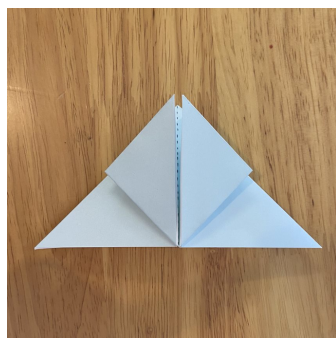
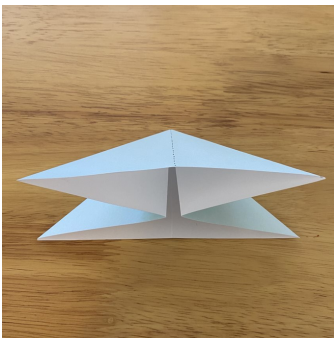
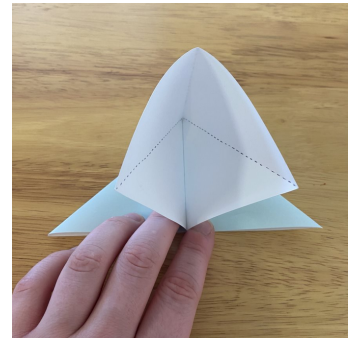
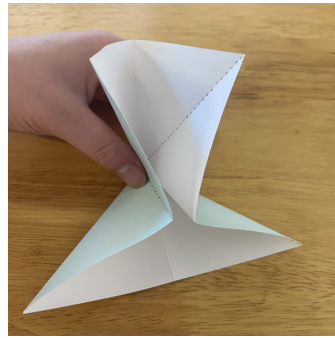
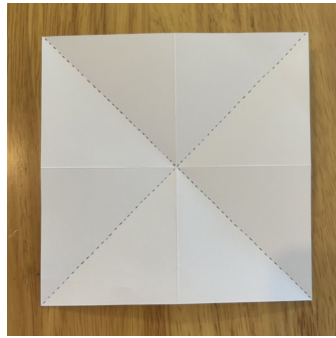
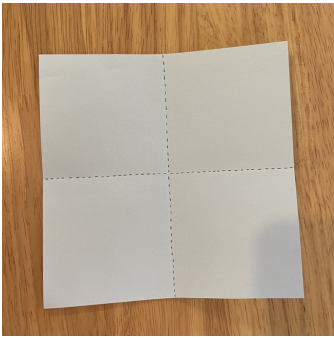
Discovering this butterfly's **secrets**.

At the Rutherford Appleton Laboratory, scientists can study the tiny structures on butterfly wings using a super-microscope called the ISIS Neutron and Muon Source. Scientists have also studied polar bear hair and beetle wings at ISIS, which both have structural colour too. This helps us to understand this phenomenon and how we can use it for our own benefit in our everyday lives.



Butterfly Origami

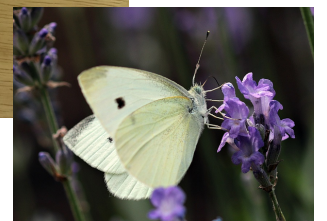
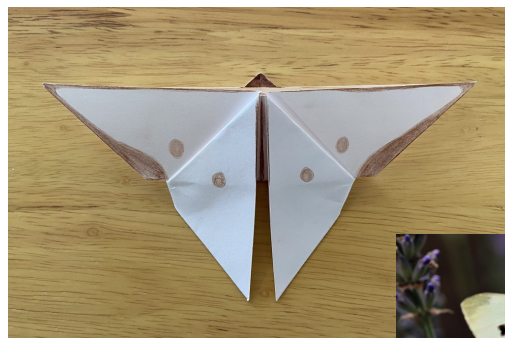
Make your own origami butterfly, and decorate it like your favourite species.



1. Fold paper in half horizontally and unfold. Fold paper in half vertically and unfold.
2. Turn the paper over, then fold diagonally both ways and unfold.
3. Bring the middle folds together, so they meet each other. Then, flatten the structure to form a triangle
4. Fold up the bottom two corners of the triangle to meet the top corner.
5. Turn the whole thing over, then fold the point upwards so that the tip peeks beyond the top by about 5mm. Turn over.
6. Fold in half along the centre line, bringing both sides together to add volume to the wings.

Time to **decorate**.

You could decorate your origami like a butterfly you have spotted outside, or a reference photo of your favourite butterfly. Does your butterfly use structural colour? If so, could you draw tiny ridges or structures which scatter light onto their wings?



Butterfly Safari

There are more than 50 species of butterfly around the UK. Spend some time searching for butterflies in your garden or local park and fill in the table below with what you see. We have pictured some common butterflies you might spot along the way.



Peacock



Red Admiral



Small White



Speckled Wood



Holly Blue



Painted Lady

For more examples,
take a look at
[www.wildlifetrusts.org/
wildlife/identify-british-
butterflies](http://www.wildlifetrusts.org/wildlife/identify-british-butterflies)

Drawing of Butterfly	Species	Description of appearance