Engineering Nature

Learn about how nature inspires human design and create a few designs of your own!

Biomimicry

Recommended for ages 8 & up // 45 minutes for the activity

Ask Yourself

What is biomimicry?

Biomimicry is using the structure and systems of living things to inspire the design of human-made things.

Can you think of any examples?

Brainstorm a list of ways you think humans have been inspired by nature in our designs. Below are a few examples.

- People are using the tips of mosquitoes' mouths, which have several moving parts, to help them create a less painful needle.
- Researches are studying how dolphins communicate underwater to help them better detect tsunami waves in their early stages.
- Engineers modeled the front of a high speed train after the bill of the kingfisher bird.
- Architects created better airflow in an office building by designing their air systems after those found in termite mounds.

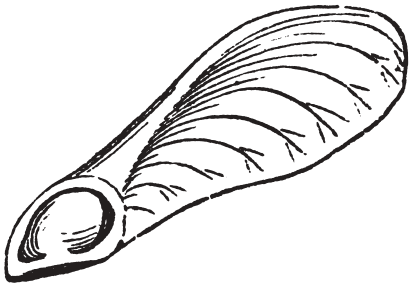
Why mimic biology?

Living things have gone through the processes of evolution and natural selection. During these processes, organisms become more complex and develop with each generation, in a way that makes them more successful in their environments.

When designing something new, engineers, architects, scientists, and other professions go through a process called 'product development.' To arrive at a final product, they must go through many different designs to find which design works best. Each design generation is called an 'iteration.' By observing parts of nature, those creating new designs can get closer to creating a successful design more quickly. After all, nature has been perfecting itself for millions of years!

Try it Yourself

Maple Seed Mimicry



Engineers have modeled the blades on helicopters and wind turbines after maple seeds, otherwise known as helicopter seeds.

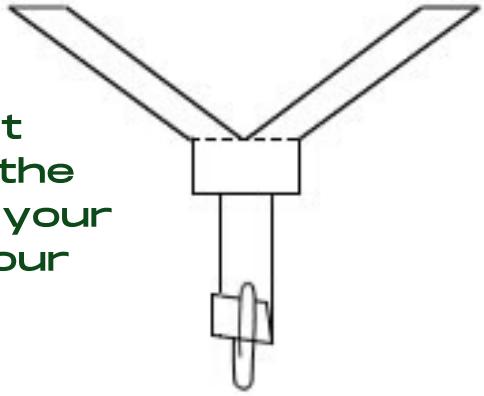
These seeds are designed to move through the air in the path of least resistance by going with the flow of the air currents. These seeds spin and move side-to-side on their way down, taking as much time as possible to reach the ground.

See if you can create models of a maple seed using paper and a small paperclip.

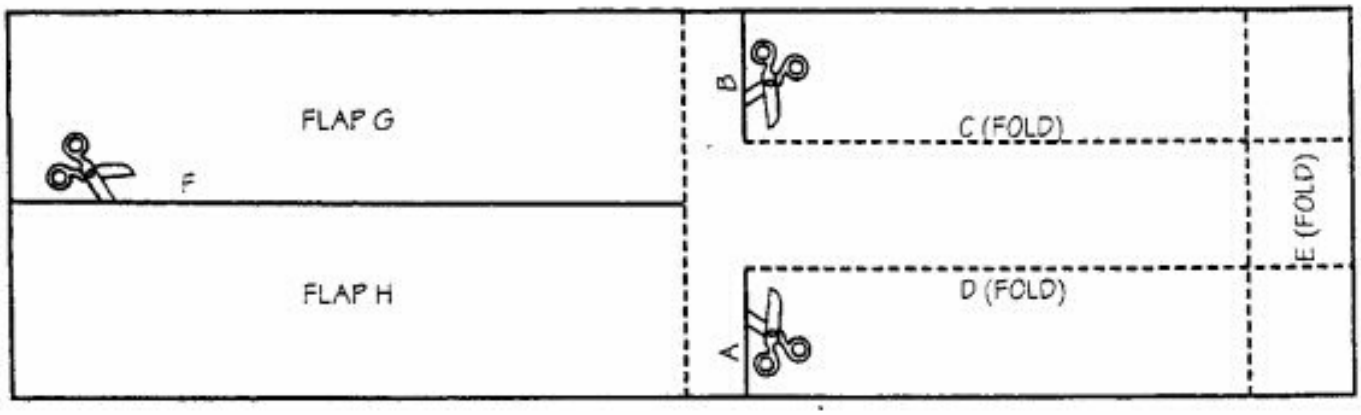
Supplies:

- Scissors
- 1 piece of paper
- 1 small paperclip

Model #1



Print and cut out the design below (or trace it onto your piece of paper), as shown. Fold on the dotted lines and cut on the solid lines. Attach your paperclip to the small fold at the bottom of your "seed." When finished, your model should look similar to the diagram to the right.

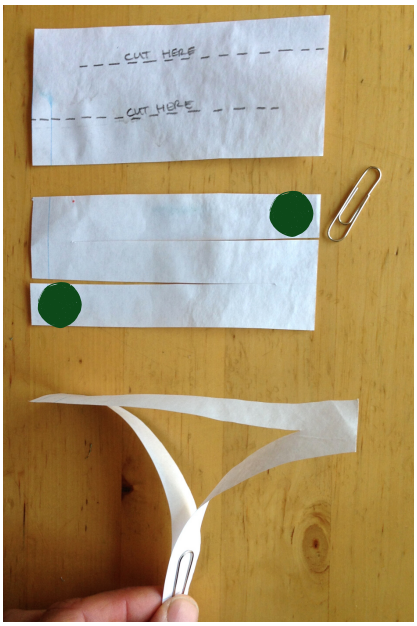


Find a location where you can safely drop your maple seed model from a height of at least 10 feet. Time how long it takes for your maple seed to reach the ground.

How long was your maple seed in the air for?

How did it move on its way to the ground?

Maple Seed Mimicry (continued)



Model #2

Cut out a rectangle of paper measuring 2 inches by 5 inches. Make the cuts shown in the diagram to the right. Once you've made your cuts, bring together the two ends of your paper (indicated by the two green dots) and hold in place with your paperclip.

Drop your second model from the same location as your first. Time how long it takes for your maple seed to reach the ground.
How long was your maple seed in the air for?
How did it move on its way to the ground?

Your Model

Using the same materials, see if you can come up with a design that takes longer to reach the ground. Drop your model from the same location as your two other models and time it as it travels to the ground.

How did your three models compare?
Which model took the longest to reach the ground?
Which model spun the most?
Which design do you feel was the most successful?