Designed by Nature

How is biomimicry used in everyday life?

Overview

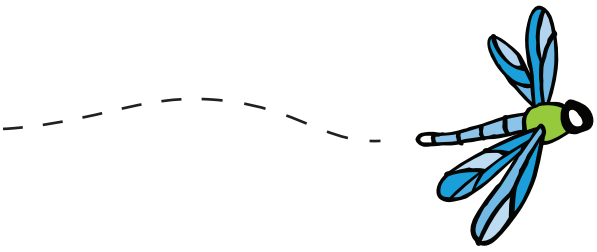
This activity will explore how nature inspired products or technologies and then use biomimicry to develop an idea for a new product.

Background

Innovation inspired by nature has provided humans with innovative designs, models, processes and systems to solve problems. This is referred to as biomimicry. Biomimicry is a method for finding solutions to human problems through inspiration by ideas and designs found in nature. Many of the things or processes we use in our daily lives are inspired by nature's ingenious designs and processes. The core principles of biomimicry involve copying natural shapes, processes and entire ecosystems.

Humans have drawn inspiration from a wide range of living things- from their structures, functions or strategies that allow them to survive in their environments. There are many real-world examples of biomimicry such as how plants capture sunlight to design solar panels, how owls fly so silently because of their special feather design to help engineers create quieter aircraft and wind turbines.

By mimicking these incredible natural designs, new innovative products or technologies can provide us with more efficient and more environmentally sustainable opportunities.



Materials

- Biomimicry cards
- Various everyday materials to represent plant and or animal structures or functions:
  - Bags
  - Cups
  - Fabric
  - Glue
  - Paper clips
  - Pipe cleaners
  - Rubber bands
  - Straws
  - Scissors
  - Tape
  - Velcro

Get Started

Part 1 — Structures and Functions in Nature

1. Different animals use their body parts in different ways to see, hear, grasp objects, protect themselves, move from place to place, and seek, find, and take in food, water and air. Plants also have different parts (roots, stems, leaves, flowers, fruits) that help them survive and grow. For example, begin with a turtle. What are special parts a turtle has (shell)? What might the shell do for the turtle? Are there any examples we use that do the same thing? Some examples could be helmets, protective gear etc.
2. In small groups, see if they can come up with an idea how everyday materials might be represented by a plant or animal part and what the purpose or function might be of that item. Provide students with a variety of everyday materials to see if they can relate it to a plant or animal that might share a similar structure or function.

3. Debrief by having groups share what everyday material they chose and how it was inspired by an animal or plant structure (part) and what purpose the structure provides. Once students have shared their ideas, write the word biomimicry on the board. Explaining biomimicry is when people get an idea from living things to help solve a problem to design, innovate, and develop a product or technology.
4. Functions in Nature. Go outdoors to find as many examples as possible of functions found both in nature and inspired everyday materials, products or technologies.

Part 2 — Design Challenge

1. Divide the class into teams of two-four. The team's challenge will be to develop, design and present their nature-inspired product or technology from a plant or animal.
2. To get things started, have each team to compile a list of things they share common interests. These interests can be anything; examples: sports equipment, music, clothes, games, furniture, cars, etc. Next, have the students agree on one of those common interests for their design topic area.
3. Tell the teams to brainstorm with their partners to come up with possible ideas for designs within their interest topic using biomimicry of plants or animals. Ask the students if they can think of any plants or animals that remind them of their topic. What unique features do those plants or animals have? How could they design something that uses those features?
4. Give students time to work together to create their new design and prepare a group presentation to pitch their new product or idea inspired by a design in nature. Ideas could include a panel of potential investors for their invention.

Reflect

- What problem did your invention solve?
- Why do you think biomimicry is important?

More Ideas

- Design kit based on different bird shapes
- Host a science fair or design challenge

Functions in Nature

Go outdoors to find these functions observed in nature and in some of our everyday materials or systems.

Function	Found in Nature	Everyday Example
Air purifier		
Attaches		
Camouflages		
Cleans		
Collects		
Cools		
Decomposes		
Distributes		

Functions in Nature

Go outdoors to find these functions observed in nature and in some of our everyday materials or systems.

Function	Found in Nature	Everyday Example
Filters		
Flies		
Floats		
Insulates		
Makes or produces		
Senses		
Stores		
Protects		