Biomimicry Project – Guidelines for Parents, Guardians & Teachers

Are you looking for a STEAM-based project for a middle school or high school student? Have them use nature as an inspiration for an engineering challenge!

What Students Will Do

- Do research about an environmental issue they care about
- Create a model that represents a solution to a real-world problem.
- Understand how adaptations help plants and animals survive in a particular habitat.

Tips for Assisting Students

- They might need help choosing reliable websites.
- Provide them information, but let them be creative.
- If a section seems too difficult, skip it or modify it.
- The most important thing is that they explore, try new things, and learn from their mistakes.

Optional Extensions

- Students can create an advertisement to market their product. This could be a video, social media post, or printed ad.
- Have them write a letter to an organization that might be able to manufacture their product explaining how the product would benefit society.

Next Gen & NYS Science Learning Standards

- Grades 6-8
  - MS-LS4-C: Adaptation by natural selection acting over generations is one important process by which species change over time in response to changes in environmental conditions.
  - MS-ESS3-3: Apply scientific principles to design a method for monitoring and minimizing a human impact on the environment.
  - MS-ETS1-1: Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions.
  - MS-ETS1-2: Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem.
  - MS-ETS1-4: Develop a model to generate data for iterative testing and modification of a proposed object, tool, or process such that an optimal design can be achieved.
- Grades 9-12
  - HS-LS4-4: Construct an explanation based on evidence for how natural selection leads to adaptation of populations.
  - HS-ESS3-4: Evaluate or refine a technological solution that reduces impacts of human activities on natural systems.
  - HS-ETS1-1: Analyze a major global challenge to specify qualitative and quantitative criteria and constraints for solut9ons that account for societal needs and wants.
  - HS-ETS1-2: Design a solution to a complex real-world problem by breaking it down into smaller, more manageable problems that can be solved through engineering.
  - HS-ETS1-3: Evaluate a solution to a complex real-world problem based on prioritized criteria and trade-offs that account for a range of constraints, including cost, safety, reliability, and aesthetics, as well as possible social, cultural, and environmental impacts.