

Science 9: Science Expo 2017: Biomimicry Design Challenge

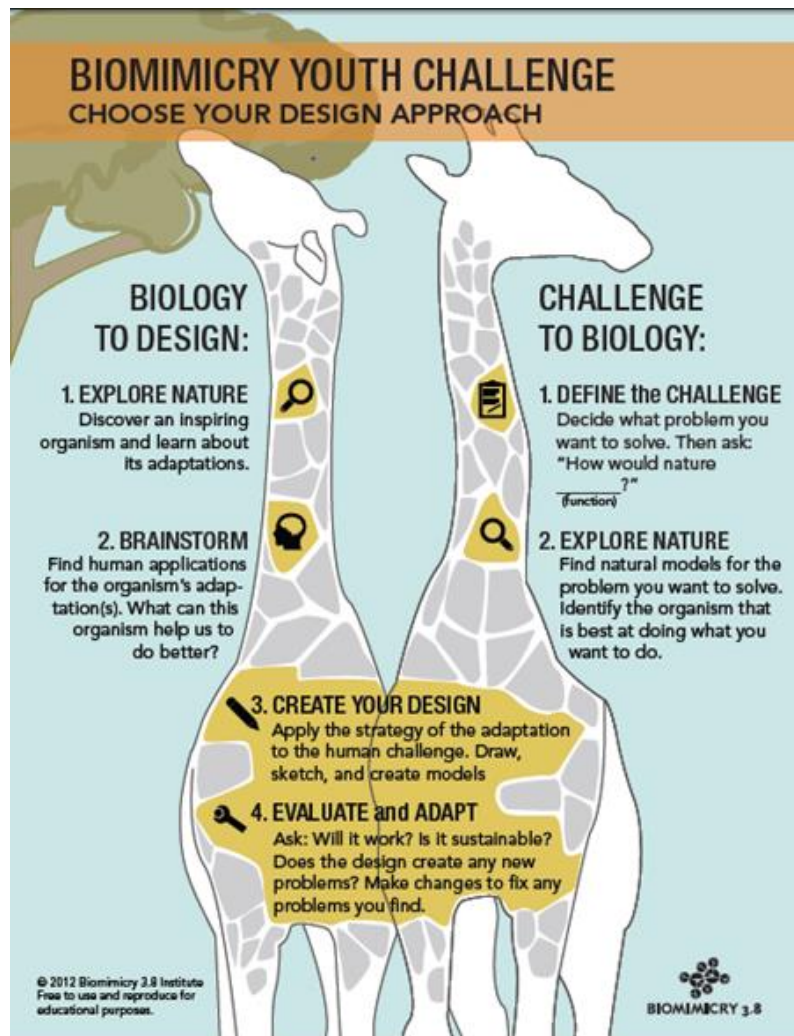
You will be given the opportunity to design an invention based on biomimicry. You will be introduced to the principles of biomimetic design and work in a group to invent something unique and creative. You will showcase your project at the Science Expo: January 30th - February 3rd.

There will be TWO main design approaches:

1. *Biology to Design* (are you starting with an insight about how nature does something special and applying that to human design)
2. *Challenge to Biology* (are you starting with a question or problem and asking nature how to solve it)

Your project must provide a solutions to one of the many impacts humans have on the environment.

What does this look like?



Group Formation

1. Groups of TWO or THREE. You will be in this group for the duration of this project.
If you would like to be selected to Regionals, must be a group of TWO

Components of Project

1. 3D Model (submitted to teacher)

- A model of your finalized design.
- The model must portray your innovation in full or reveal in detail the abstraction that you have chosen
- To achieve high marks in this area, it must be evident that your group put time and care in your model.

2. Biomimicry Research Tool & Written Component (submitted through Google)

- This research tool will guide you through the biomimicry process.
- The written component is your final written component.
- This completed document is to be submitted through Google Docs

3. Visual Display (Example: poster, booklet, pamphlet) (submitted to teacher)

- Create a visual display that provides background information about your model in a colourful, polished and creative manner. This will include diagrams and main points of your written component (explanation of problem, model organism and problem & evaluation of your solution)
- Your visual display must be in high quality format to receive full marks

Timeline:

	Week 1 Explore	Week 2 Explore	Week 3 Explore
Dec 8th or 9th	On Explore	Part I & II of Research Tool Completed	
Dec 15th or 16th	Part I & II of Research Tool Completed	Part III of Research Tool Completed	
Jan 13th or 14th	Part III of Research Tool Completed	On Explore	Model Building and Part IV Complete
Jan 20th or 21st	Model Building and Part IV Complete of Research Tool		On Explore
Jan 27th or 28th	Written Component, References (Part B and Part C of Research Tool) and Poster Complete * FINAL PROJECT DUE *		
Feb 3rd or 4th	SCIENCE EXPO		

Project Check Ins:

	<u>Project Check In #1</u>	<u>Project Check In #2</u>
Week 1 Explore Groups	Dec. 15 or 16 Parts I and II of Research Tool	January 20 or 21 Model Complete and Part IV of Research Tool
Week 2 Explore Groups	Dec. 15 or 16 Parts I, II and III of Research Tool	January 20 or 21 Model Complete and Part IV of Research Tool
Week 3 Explore Groups	Dec. 15 or 16 Parts I, II and III of Research Tool	January 13 or 14 Model Complete and Part IV of Research Tool

Rubric

	16-20	9-15	1-8
Model	Time and care has been put into your model, the quality of the model is excellent, with excellent attention to detail.		Minimal time and care has been put into your model, the quality of the model is poor, and lacking attention to detail.
	4-5	3	1-2
Originality & Creativity	Innovation is an original and highly creative idea.		Innovation is lacking in its originality and/or creativity.
Feasibility	The design is feasible with access to the proper resources and materials.		The design may not be feasible even with access to the proper resources and materials.
Visual Display	Time and care has been put into your visual display, Diagrams and main points of your project are included. The visual display is high quality with excellent attention to detail.		Minimal time and care has been put into your visual display. Diagrams and main points of the project are not included. The visual display is have low quality and lacking attention to detail
	8-10	5-7	1-4
Research Tool (Part A)	Part A of the research tool is completed. Tables include sufficient detail and appropriate photos are uploaded to demonstrate your design process		Part A of the research tool is incomplete. Tables do not include sufficient detail or are missing portions. No photos are uploaded to the document.
	4-5	3	1-2
Written Component - Human Impact Problem (Part B)	An explanation of why this is a problem that needs to be solved. Includes environmental impact and, who would benefit. Data and statistics are provided.		There is an inadequate explanation of why this is a problem that needs to be solve. Does not include environmental impact and/or who would benefit. No data or statistics are provided
Written Component - Model Organism (Part B)	The paragraph is well written to demonstrate how design principles from organisms are used in their design.		The paragraph is unclear in demonstrating how design principles from organisms are used in their design.
Written Component - Solution & Evaluation of your Solution (Part B)	The discussion of the success of your group is of high quality. It is evident that the group reflected well on their process. All questions provided in the research tool were answered with excellent detail and clarity.		The discussion of the success of your group is of poor quality with minimal reflection on the process. All or most questions provided in the research tool were not answered or done very hastily.
References (Part C)	Full APA style reference for your sources. At least four references are given and in proper format.		References very brief and incomplete. At least one reference is given.