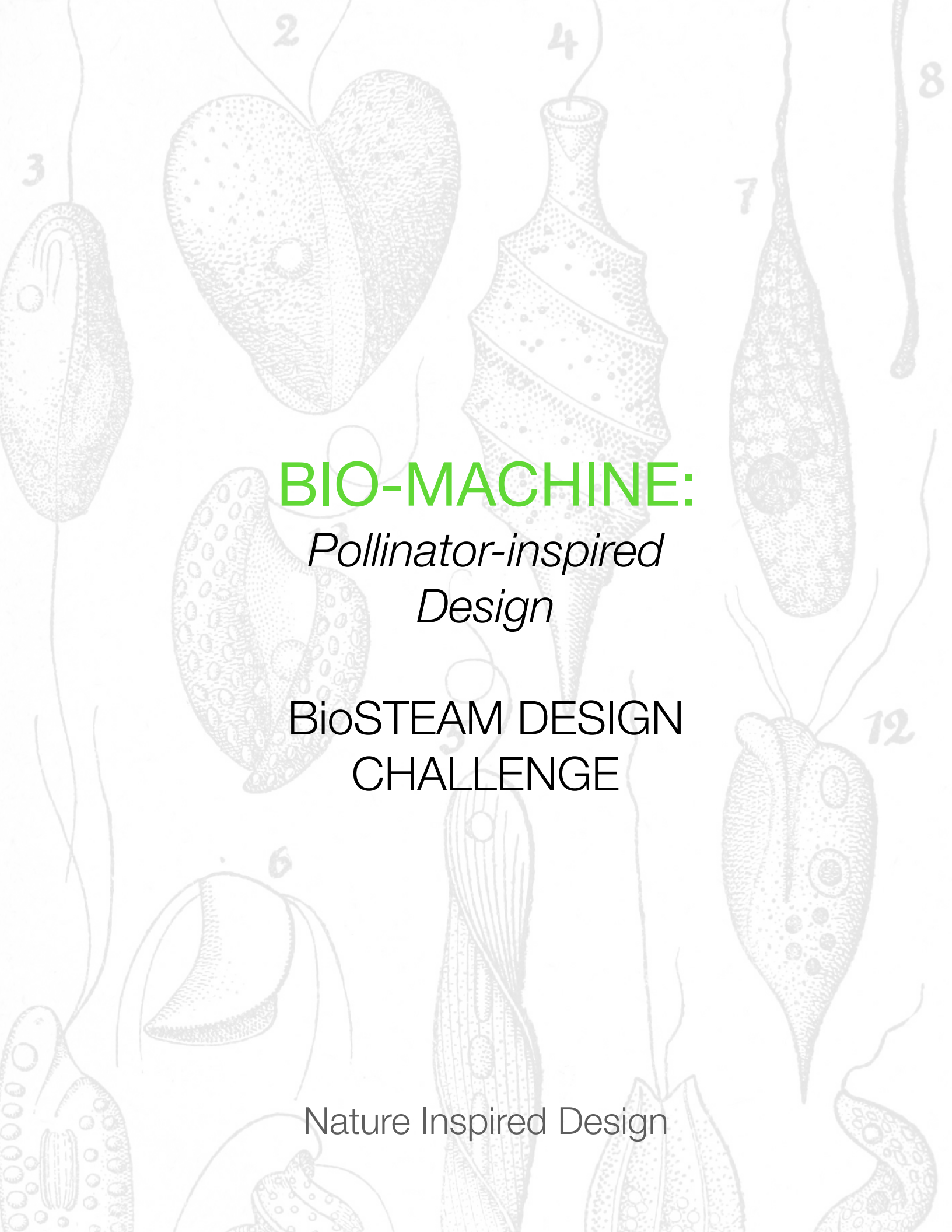
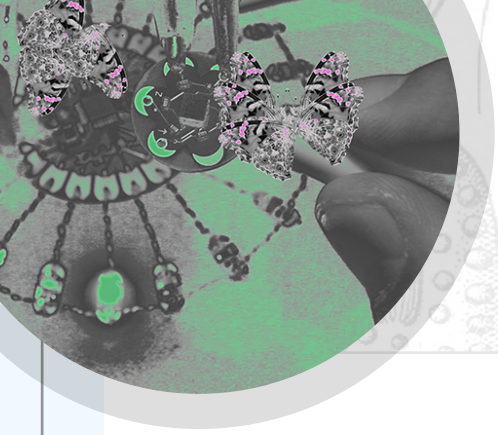


BIO-MACHINE:

Pollinator-inspired Design

BioSTEAM DESIGN CHALLENGE

Nature Inspired Design



BIO-MACHINE:
POLLINATOR INSPIRED DESIGN

Explore the Pollinator Concentrator project to learn about biodiversity loss and pollinator decline and let it inspire a design for a wildly imaginative BIO-MACHINE that helps us live in balance with nature and protect biodiversity locally and globally. See the SNAPSHOTS for a quick look at the pollinator and bat inspiration species. The biomimicry curriculum methodology is derived from and in consultation with Ana MacArthur. The Pollinator Concentrator installation by Ana Macarthur inspired and informed the Pollinator Concentrator Project. Visit Ana MacArthur website to learn more.

WHAT IS A BIO-MACHINE?

For the BioSTEAM Design Challenge we are using the term BIO-MACHINE to describe an invention that incorporates, synthesizes or is inspired by biological materials or systems in the design. The final design can be an object, a new system or an interface between species. It performs a task or combination of tasks to solve a problem.

WHAT ARE SOME EXAMPLES OF A BIO-MACHINE?

Invention can take many forms: A bio-machine interface for the human body inspired by bats with tiny dot pattern sensors that light up to detect and block airborne viruses; A bio-machine sensor inspired by earthworms that squirm in the dirt consuming all the unnatural chemicals in the soil; A swarm of drones that emit signals that ward off pests that contribute to crop devastation; A clay air conditioner inspired by compound eyes that collects and cools water; or a polarizing camera that reveals abandoned land mines. Use your imagination.

WHY POLLINATOR INSPIRED DESIGN?

Pollinator species diversity provides an incredible resource to learn from. The interspecies art installation, Pollinator Concentrator, highlights six species of pollinators local to Rio Fernando Park or in reference to global species in peril. Pollinator species as a group represent interesting biological strategies that scientists, artists and engineers are mimicking to design new technologies. The BioSTEAM Design Challenge is an opportunity to learn from nature and to cultivate the agency to innovate the art, culture and technologies for a resilient future.

IMAGINE FUTURE INNOVATION

Let your imaginations fly to create an original BIO-MACHINE that is an expression of what you have learned. BioSTEAM encourages creative, wildly impossible futuristic solutions, as well as innovative and practical designs.

The final pollinator inspired BIO-MACHINE should be an artistic expression, and clearly demonstrates that careful thought has been given to its sustainable materials, ecological impact, benefit to community and planet, and sensitivity to the biocultural diversity of the community it serves. Research and consider the benefits and risks of your BIO-MACHINE. Reflect on the ethical implications of your design to assure a do no harm ethos.

What pollinator inspired bio-machine can you invent that uses existing and future technologies in a way that is in balance with nature and can protect biodiversity?

What are the ecological impacts of the materials you have chosen? How does your machine get power? How does it process waste?

How can pollinator adaptations and processes inspire new tools and creative application to real world challenges?

BIO-MACHINE DESIGN CHALLENGE GUIDELINES

1. Go to the BioSTEAM Design Tool on the BioSTEAM website. Here you will have access to information about the topic of biodiversity loss and pollinator decline to inform and inspire your BIO-MACHINE design.

2. Choose one or more pollinators from the list of 6 pollinators to inform your design.

3. Decide on an idea for your BIO-MACHINE design. *What will be its purpose?* Choose from one or more of the Biodiversity topics that address challenges and opportunities. *How is your pollinator-inspired Bio-Machine helping us to live in balance with nature?*

4. Choose the science/technology that will support your design. The idea can be futuristic but it must be based in science. Use the sketch pad to try out ideas.

5. Choose the materials and processes that you imagine for your design.

6. Write a design statement that describes your BIO-MACHINE: How it works, how it addresses one or more of the Biodiversity topics, what is the research-based science/technology behind the work, what are the sustainable materials that would be used, how it helps people/community/planet, how you designed it sustainably for and with nature.

7. Create your final BIO-MACHINE design in whatever medium you like. The final should be a two dimensional image scanned into a high quality JPG.

8. Submit your design statement as a one page PDF and the final design as a JPG.

DESIGN Criteria	Criteria Explained
Creativity (2 pts)	The design is creative and uses futuristic ideas to address possible solutions to the problem.
Science & Technology (2 pts)	Innovative research based science and technology informed the design.
Nature-Inspired//Pollinator focus (2 pts)	Mimics pollinators/nature's adaptations as part of the design or demonstrates knowledge of the complexity of nature in the design.
Craftsmanship (2 pts)	Design reflects effort and attention to detail and professional presentation.
Community/Culture Connections (2 pts)	Reflects on the impact the design would have on the greater community and cultural traditions
Sustainable materials/practices (2)	Design demonstrates consideration of sustainable materials and practices; impact on biodiversity
Submission guidelines. (2)	Meets the submission guidelines
Total (out of 14 pts)	

SKETCH
PAD

***Design Journal/Notes**:*

Species: Bio-inspiration	Research: Science and technology	Purpose: Application in world

Name: School: