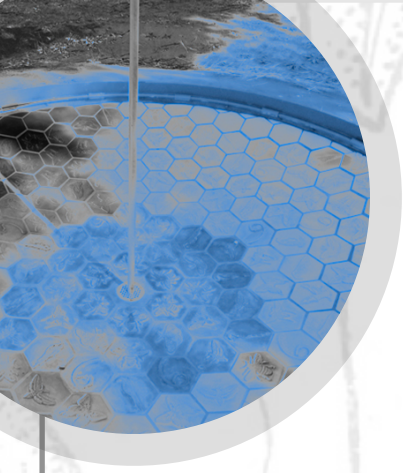
BIO-MACHINE:

Pollinator-inspired Design

BIODIVERSITY TOPIC OVERVIEW

Nature Inspired Design



BIOSTEAM TOPICS OVERVIEW

Explore the three main biodiversity topics this project. Research what inspires you and the topics, or pollinator species that you will choose to inform your sci-art experiments and designs. Watch the INTERviews to see how people are using new models from multiple worldviews to protect biodiversity. Learn about how art, science, technology and culture are inspired by nature. Use the sketch pads to experiment and journal inspiration for your BIO-MACHINE design. Connect to the people working on the BioSTEAM project and see the art and ecology at Rio Fernando Park. Do something now to help scientists using tech tools to monitor and protect local biodiversity in citizen science projects online.

BIODIVERSITY LOSS + PANDEMIC DISEASES

Human activity has an immense effect on the life connections around us. How we seek knowledge, learn to do things, and the way we connect to people and place will define what impact humanity has on the future of our shared planet. Biodiversity loss is a poignant topic as the COVID-19 pandemic has direct ties to habitat encroachment, exploitation of resources and the spread of zoonoses.

FOOD SOVEREIGNTY + COMMUNITY

Biodiverse relationships can be observed at all scales and and from many perspectives. The effect of pollinator loss and species decline has a big impact on our environments ability to adapt to change. We'll need big ideas to envision and design a biodiverse future. These big ideas can be found at multiple scales and can be demonstrated in the relationships of community to place. One of humanities closet relationships with nature is through the food we eat. At the tiniest scale, atomic interactions aid the pollination that is happening to produce edible foods for animals at every level of the food web. At larger scales food is distributed globally, so that even the bat pollinating the chocolate in your candy bar has an impact on the system as a whole. Our industrialized food system is one of the major contributors to biodiversity loss because of the way we approach problems and enact solutions. The Food Sovereignty movement is another way people are enacting scaled solutions in place as a response to biodiversity loss and the food system. It approaches solutions from the perspective that it is the right of all people to healthy and ecologically safe consumption, production and distribution of food.

TECH TOOLS FOR ENVIRONMENTAL PROTECTION

TECH Tools are the tools and technologies developed and used by human culture to engage nature. Tech tools are the interfaces between humans and nature. Even with the best intentions some do good and some do harm. For example industrial agriculture uses pesticides to control pests that threaten mono-culture crops. The unintended consequence of this solution is that broad chemical treatment can have a detrimental impact on biodiversity such as the vital ecological relationships between soil, plants, pollinators and water systems. We will need to develop creative technological and cultural tools to address the difficult problems in our world like biodiversity loss and climate change.

BioSTEAM WIKI KEYWORDS

biodiversity
ecology
human impact
species in peril
nature inspired design
restoration
COVID 19
food sovereignty

QUESTIONING
Ways of Knowing + Ways of Doing

Creative problem solvers are looking to natural systems and creatures for inspiration on solve the complex problems we face in the world.

What are some of the challenges we face with biodiversity loss and pollinator decline?

How might we approach the problem of biodiversity loss and pollinator decline through different cultural lenses?

What interdisciplinary tools can we imagine to address the challenges?

How has nature approached design challenges in their environment?

OPEN-ENDED QUESTIONS

Open ended questions are meant to facilitate discussions that inspire creativity and dig deeper into topics than yes and no questions. The questions can be used with the Biodiversity Topics Map to dig deeper into the BioSTEAM project. Sketch out topic connections you find on the topics sketch pad. For further information on nature inspired design, the installation at Rio Fernando Park or the artist, search the bioSTEAM Wiki and explore the curriculum design tool.

Ana MacArthur's artwork, like Pollinator Concentrator, is inspired by the diversity and ingenuity of nature. Art, science, technology and culture often start in an act of questioning whether it is to test a hypothesis, experiment with new ideas or to look to nature for solutions to complex problems. Nature Inspired Design may not be new, but it is being applied to the ever changing challenges we face today in novel ways.

It leads with the deceptively easy question: *How has nature solved this?*

BioSTEAM
WIKI KEYWORDS

biodiversity
ecology
Rio Fernando Park
human impact
species in peril
nature inspired design
biomimicry
sensing the invisible
quantum biology
engineering

PEOPLE IN PLACE:

unique point of views interacting in a distinct place

How might a place or ecology inspire unique design solutions for survival?

How might art and science combined impact how solutions are developed locally and through time?

What can artists, scientists and cultural specialists learn from the successful strategies developed by animals and plants?

WAYS OF KNOWING:

the ways we gather, process + disseminate big ideas.

What invisible relationships do we depend on to survive? How do we know they are there?

How might human impact effect these relationships?

How might this change be observed by a bee? Or a giant? Why do these perspectives matter?

How might a worldview impact how big ideas are developed and communicated?

How can native science inform our design solutions to environmental challenges?

WAYS OF DOING:

the tools and technologies we create to put ideas into action.

How do we develop tools to test and actuate ideas?

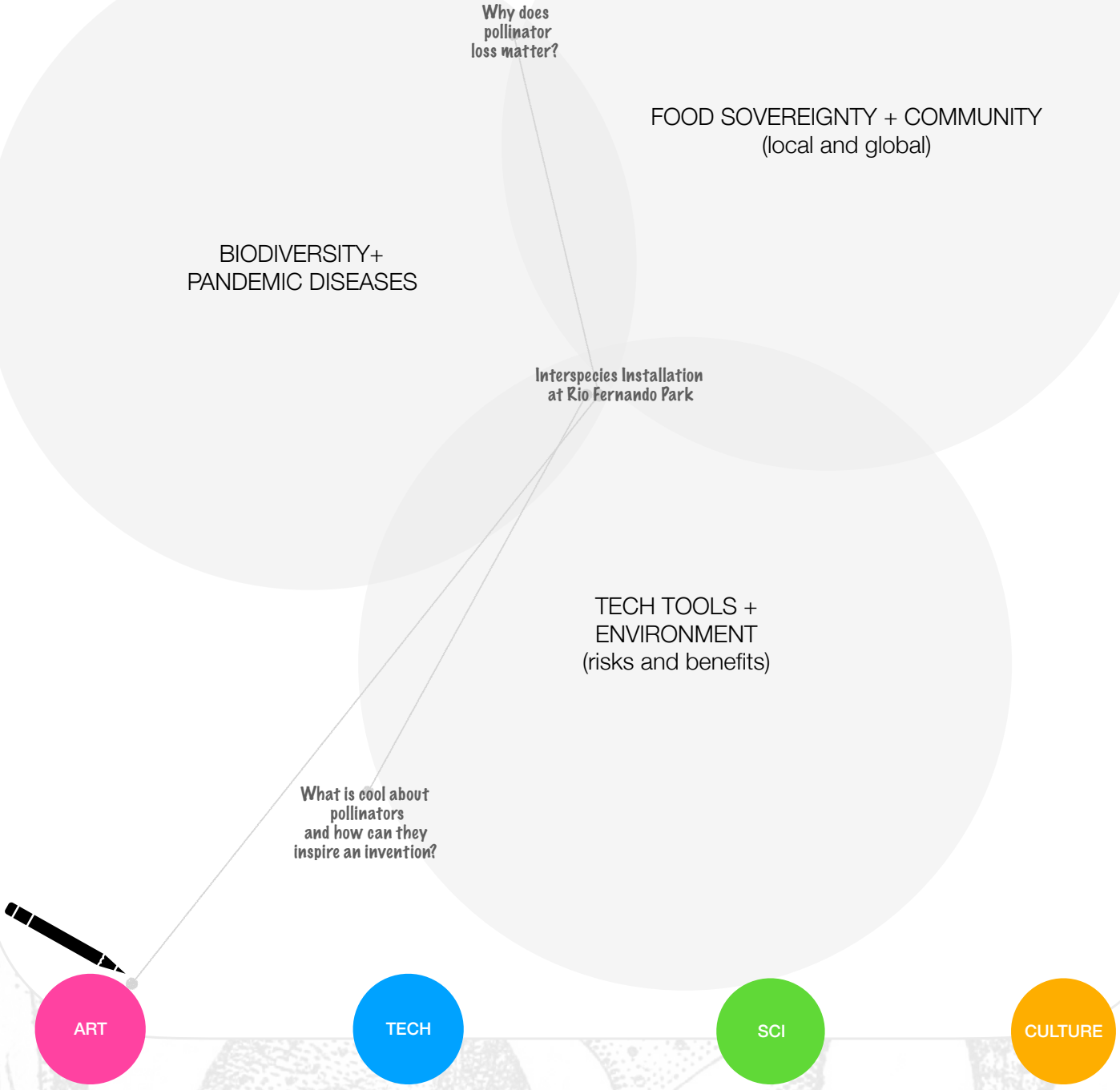
How might your worldview impact how tools are used or developed?

How might the worldview of an artist, scientist, engineer or entrepreneur affect the design of the tool? What can these disciplines learn for each other?

What tools and technologies can we design inspired by successful strategies working in nature?

The Biodiversity Topics Map below gives you a birds-eye view of the topic areas embedded in the Pollinator Concentrator project. See the interdisciplinary connections explored in the BioSteam Design Tool and throughout the project. Trace how the BioSTEAM concepts highlight the working relationships between art, culture, science, and technology. Search the BioSTEAM Wikis using the colored keywords to see the big picture.

TOPICS SKETCH PAD



Draw connections between big ideas found in Art, Science, Technology and Culture, and the topics of biodiversity loss, our food system and the tools of nature inspired design. A connection has been drawn to get you started. Write in topic words or questions on the diagram above to explore the connections *you* are making. Or create your own mind map! Discuss in small group or as a class.

What stands out?
Do any ideas or connections inspire you?