



Plymouth & Bradoaks Elementary Schools

Online STEAM Garden and Food Education Proposal

Prepared by:

Food ED

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Overview:

Food ED will deliver a nine-month STEAM garden and food science curriculum to Plymouth and Bradoaks Elementary Schools ***either online or in person*** in line with the government of California mandates and Monrovia School District policies. Each month will provide appropriate and engaging K-5 Next Generation Science Standards (NGSS) lessons and activities. Our online curriculum features videos of schools and Monrovia parks as well as equitable interactive lessons for students in any type of housing situation. In person learning will be adapted when safe to do so. This proposal covers our themed education program and how it will be delivered online presently; the cost covers nine months of our curriculum.

Objectives:

- 1) Provide schools with NGSS online lessons, monthly downloadable packets, engaging STEAM crafts and activities, and recipes primarily focused on Monrovia ecosystems.
- 2) Each month features a theme such as pollinators, food webs, plant exploration and anatomy focused on the science of leaves, flowers, stems, and roots, agriculture, seeds, insects, seasons, and more.
- 3) Interactive lessons will take into account learning environments of students living in areas without access to a natural setting. We invented an interactive local park guide covering all parks in Monrovia for safe exploration of plants, insects, flowers, and trees.
- 4) STEAM garden crafts and food science recipes utilize objects easily found in homes such as water bottles, brown paper bags, honey, yogurt, and other everyday items.
- 5) Video content will utilize existing school gardens and showcase Monrovia to students in new, exciting ways.
- 6) Curriculum is easily adaptable to being back in person when safe to do so.

Opportunities:

- 1) STEAM garden and food science pedagogy is an interactive way to introduce NGSS requirements in exciting and engaging ways.
- 2) Students will learn not only about gardens and food, but how to apply this learning to problem solving, environmental science, and healthy living concepts.
- 3) Food ED is run by local experts in the San Gabriel Valley which means we are dedicated to community partnerships with our schools, teachers, and district for measured success.
- 4) Our online curriculum partners with the school gardens and the local community to provide a unique, special, equitable, and localized experience for Monrovians.

Details:

Food ED collaborates with communities and schools to construct and sustain edible education sites hosting programs on ecosystem stewardship, healthy living, and environmental innovation and entrepreneurship.

Food ED welcomes the opportunity to present a proposal for a nine-month garden and food science STEAM curriculum. Our curriculum is adaptable to online and in-person learning for K-5 Next Generation Science Standards (NGSS). Each month will feature a different theme and be divided into lessons and activities students can do at home or on a safe-distance visit to a local Monrovia park in their neighborhood. Since Food ED is run out of Monrovia, our experts are able to give a personalized view into Monrovia's ecosystems including plants, insects, and trees that make up our mutual home.

Each month students will download a PDF packet on the month's theme. It includes a video lesson on the packet, a STEAM garden craft instructional video, a recipe video, and a video link to detailed content on the theme. Additionally, there will be options for local explorations in one's yard or a Monrovia park. If a student does not have access to a yard or natural area at their home, we want to be sure to include activities and explorations locally which are accessible and equitable.

Our curriculum is specialized to Monrovia for this purpose while also encouraging a growth mindset on plant life, healthy living, and food science wherever a student is located. We are equipped to upload videos and distribute online packets to the schools for the fall of 2020 and if needed, spring of 2021, if not in person. We are ready to resume in-person lessons at the schools' gardens when the district and governor deem it safe to return to school. The proposal does not cover garden care and maintenance or all additional materials needed once in-person lessons resume. Both Bradoaks and Plymouth are receiving separate proposals for their actual garden spaces. This proposal outlines a detailed example of one month of curriculum while providing additional themes to be incorporated during the year – whether online or in person. We will work with the individual school's administrators to roll out the material in a way that is manageable and helpful to the teachers.

One Month Overview Sample

Food ED Monrovia Virtual/At Home Program Example: Pollinators (Sample: Not for Distribution)

Packet	K-1st	2nd-3rd	4th-5th
Part 1 Overview: Diversity of pollinators and pollination mechanics			
Week one: Lesson	Plants make nectar for pollinators and pollinators move pollen for plants	Understanding how pollinators move pollen	The science of pollination and reproduction
Week one: Videos	<ul style="list-style-type: none"> • Packet Explanation • The Hidden Beauty of Pollination • Pollinator gardens 	<ul style="list-style-type: none"> • Packet Explanation • The Hidden Beauty of Pollination • Pollinator gardens 	<ul style="list-style-type: none"> • Packet Explanation • Parts of a flower and pollination • Pollinator gardens
Week two: Activity	Garden explore and draw a pollinator that you find and describe it. Use Monrovia field guide.	BEE-Come a Pollinator efficiency exercise. Use Monrovia field guide.	BEE-Come a Pollinator efficiency exercise. Use Monrovia field guide.
Part 2 Overview: Honey/Importance of pollinators			
Week three: Lesson/Video	Bees SciShow Kids & Recipe video	Like Fruit? Thank a Bee SciShow Kids/ World without bees & Recipe Video	Where does honey come from? World without bees & Recipe video
Week three: Recipe	Honey- parfait	Honey - parfait	Honey - honey cookies
Week Four: Craft	<u>Create a Pollinator</u> K: Bee/Butterfly Coloring 1st: Add a pollinating mechanism to craft	<u>Prototype a pollen producer</u> Draw a pollinator and craft a flower that would be ideal for your pollinator to pollinate	<u>Prototype a pollen producer and pollinator</u> Draw an alien pollinator and an alien flower that would be ideal that are symbiotic-Biomimicry! to include plant 3 plant parts

Food ED's Monrovia focused supplemental materials (Part of week two, but can be used any week of the month.)	<ul style="list-style-type: none"> • Monrovia Pollinator Field Guide • My Pollinator Workbook K-1 • Map of Monrovia garden & plant highlights at parks & outdoor spaces 	<ul style="list-style-type: none"> • Monrovia Pollinator Field Guide • My Pollinator Journal workbook 2-3 • Map of Monrovia garden & plant highlights at parks & outdoor spaces 	<ul style="list-style-type: none"> • Monrovia Pollinator Field Guide • My Pollinator Journal Workbook 4-5 • Map of Monrovia garden & plant highlights at parks & outdoor spaces
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Monrovia Park Examples

Finding pollinator plants at Monrovia Public Parks



Explore native Monrovia sage flowers!

Or find non-native plants that pollinators can use as well!

Discover Monrovia's Pollinators



Additional Monthly Themes

- **Second Month**
 - **Plant Exploration: Leaves, Stems, Plant parts**
 - **Will cover: Photosynthesis, Leaf shape and meaning, Solar Energy**
 - **Food Science: Leaves and flowers we can eat**
- **Third Month**
 - **Food Webs, Waste, and Compost**
 - **Will cover: Food system and cycles, insects, and seed dispersal**
 - **Food Science: Meals from leftovers and food scraps**
- **Other themes: Insects and garden critters, Seasons, Agriculture, Fruit and fruiting plants**

Food ED Team Bios

Kristin Ritzau, PhD. and Giangelo Leos are the instructors for the curriculum.

- Kristin Ritzau, PhD is Founder and Executive Director for Food ED. She serves as the Garden Director for Monrovia Community Garden and most recently as the Director of Sustainable Edible Education (SEEd) at California Lutheran University. She has a passion for interdisciplinary action-driven education that inspires students and communities to live more connected to their neighbors and ecosystems. She and her family turned their Monrovia home into a homestead over the past 12 years. They grow 50-200lbs of produce a month. This passion led her back to school to complete a master's degree in Leadership and a PhD in Religion, Education, and Ecology where she studied female farmers around the U.S. after teaching in the Organizational Leadership Department at Azusa Pacific University for six years. She has presented her research at national conferences and done workshops both locally and nationwide on various leadership topics. Most recently, she founded Monrovia Community Garden which, in its first year, has won two regional awards, interacted with thousands of community members, developed a diverse and experienced volunteer leadership team, led numerous community workshops on topics such as: how to grow veggies, tree care, kids gardening and crafts, and preserving your harvest.
- Giangelo Leos is Food ED's Garden Education Director. He was the education and outreach coordinator for a Gardenvue Landscape Company and is a member of the Garden Leadership Team at the Monrovia Community Garden. He is a Master Gardener, California Rare Fruit Tree member, and a certified California Naturalist. His work consists of designing creative curriculum that meets NGSS standards and educating all ages about soil and plants. He has lived in Monrovia for his entire life and attended Wildrose, Clifton, and Monrovia High School. He has degrees from California State University, Long Beach in American studies and physical anthropology where he published work on representations of animals throughout history and is completing a Master of Library and Information Science degree with a research focus on botanical libraries. An avid gardener and community scientist, he and his wife are constantly experimenting with sub-tropical trees, trying new heirloom varieties, and working to identify microbial life in their soil.

Projected Costs:

The costs here represent the price for to each school to access the material for nine-months of curriculum and working with each school's administrators and teachers to roll this out efficiently.

Nine-month Food ED STEAM Garden and Food Curriculum	
School	Cost
Bradoaks Elementary	\$3,000
Plymouth Elementary	\$3,000
TOTAL	\$6,000.00

Prepared by,
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**Food Exploration
& Discovery**



Explore with Food ED

*Fall: The Garden
Ecosystem*



2nd-3rd Grade

Monrovia's Pollinators Pt.1

NGSS in the Garden

Interdependent Relationships in Ecosystems 2-LS2-2

Develop a simple model that mimics the function of an animal in dispersing seeds or pollinating plants.

Biological Evolution: Unity and Diversity 3-LS4-4

Make a claim about the merit of a solution to a problem caused when the environment changes and the types of plants and animals that there may change.

Engineering Design 3-5-ETS1-3

Plan and carry out fair tests in which variables are controlled and failure points are considered to identify aspects of a model or prototypes that can be improved.

Science Content Standards for CA Public Schools

Life sciences, 3.3.c. Students know living things cause changes in the environment in which they live: some of these changes are detrimental to the organism or other organisms, and some are beneficial.

Life sciences, 4.3.c. Students know many plants depend on animals for pollinations and seed dispersal, and animals depend on plants for food and shelter.

Time Frame: 1 hour

Overview: Students will explore local pollinators and how diverse pollinators help pollinate plants.

Objectives: To discover environments and habitats connected with pollinators, explore the interactions between pollinators and habitats, explore the best attributes an organism possesses to pollinate, design and carry out a prototype that reflects creative resources in identifying key pollination traits.





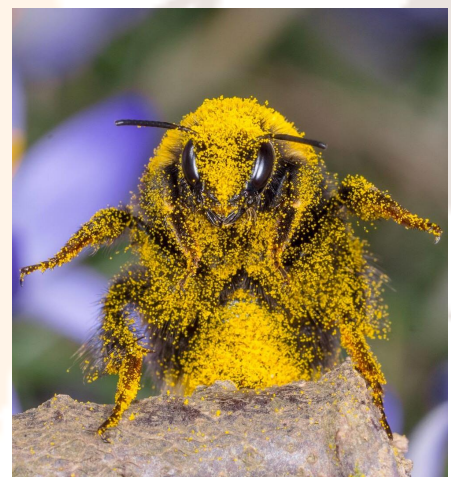
Step 1:
Write your
name on your
pollinator
journal and
read about the
different types
of pollinators

What types of flowers are different types of pollinators attracted to and how do pollinators move pollen?

Bees are attracted to **Blue**, **Purple**, and **Yellow** colored flowers with flat blossoms they can land on or small flowers that they can crawl into.



Some bees carry pollen between plants in their **pollen baskets** or corbicula. Other types of bees transfer pollen that gets attached to the fine hairs on their bodies.



Unique Pollinators

Mammals can be pollinators too! Bats, small lemurs, and even people like you can spread pollen!



Step 3: Complete your Pollinator Journal!



- Sit near plants with flowers and observe what you see.
- What types of pollinators are there?
- Are they going to a certain colored flower?
- Share what you find and draw those pollinators in your journal!



Crafts, Recipes, Activities, Videos, Monrovia park exploration, & more!

