



Fall 2025
Kindergarten - Hummingbirds

Small and Powerful

Small and Powerful is a four-month theme that will introduce students to the wonderful designs of relatively small organisms that have a significant impact on our world. These critical creatures provide great service and support to countless life forms on the planet. Gardens provide numerous examples of our human reliance on these small beings, though we often have little knowledge of their roles. So get out your gardening shovels, your honey bears, and your microscopes as we delve into the often-overlooked world of nature's small helpers.



Investigation One

Worms: Recycling Experts and Sustainable Engineers

Perhaps one of the least appreciated creatures in their role of supporting farms is the 'lowly' earthworm. Through their relentless burrowing in soil and their masterful recycling of nutrients, they help to both aerate the earth and fertilize it with their castings. Builders of quality soil, earthworms are one of nature's greatest engineers and recyclers.

Mini-Immersion will provide entrance into each investigation:

- Exploring Worms through worm bins
- Hidden Villa Field Work on Worms and Bees
- Exploring Foothills Park

Did you know that earthworms ...

- *can be kept alive for 6 years?*
- *lack eyes but are light sensitive?*
- *do not have lungs but breathe through their skin?*
 - *can survive freezing?*

Through the use of gardens and worm farms, students will have ample opportunity to observe, grow, research, and promote the lowly earthworm.

Investigation Two

Bees: Spreading the Joy

The complexity of our planet is in part due to the creative adaptations and interactions of countless small organisms. One of the key components of a thriving farm community is the population of bees. These busy, buzzing bee-ings are essential to the fruition of crops upon which humans depend.

Did you know...

- *a bee worker can visit 2,000 flowers in one day?*
- *changing queens in a colony can change the personalities and behaviors in a beehive?*
- *a bee can flap its wings 12,000 times per minute to carry the weight of their body and the pollen?*
- *bees use the most complex symbolic language of any creatures on earth, with the exception of primates?*
- *a honey bee packs a million neurons in a brain the size of a cubic millimeter?*



Students will have the pleasure of studying this sweet creature, known to be one of the most efficient and complex of nature's engineers.



Investigation Three

Fungus: The Hidden Kingdom

Fungi are in their own category of living species -- their own kingdom. Once listed under the plant kingdom, scientists discovered that fungi had more in common with animals than plants. Most of the time, fungi are hidden in the soil under our feet. Unless they fruit in forms such as mushrooms, puffballs, or truffles, we may never be aware of them, nor of the role they play in supporting life as we know it. We are indebted to fungi for the critical function they perform in transforming dead plant life into rich soil. Without mushrooms and other fungi, we would be wading through accumulations of plant matter with little soil to sustain life.

Did you know...

- *under the right conditions, spores of mushrooms can remain viable for decades, even a century?*
- *penicillin comes from Penicillium fungus and has saved countless lives since its discovery?*
- *fairy rings, some as old as 700 years and as large as a half-mile across, are a living fungi community?*
- *mushrooms grow so fast because of the ability of their cells to enlarge or 'blow up'?*



**“The garden suggests
there might be a place
where we can meet
nature halfway.”**

Michael Pollan



Key Dates: Fieldwork and Experts

(September TBA)

Vermicomposting Guest Expert from UC
Agriculture and Natural Resources

(September TBA)

Vermicomposting Workshop at Martial Cottle
Park

(October TBA)

Guest Expert from Sager Family Farms

(October TBA)

Fieldwork at a Local Bee Farm (bees)

(November TBA)

Fungus Guest Expert

(December TBA)

Fungus Walk at Foothills Park

(Friday, December 12, noon)

Celebration of Learning



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On Friday, December 12, students will demonstrate what they have come to know about nature’s small and powerful creatures through visual arts, observational journals, and interactive stations.

Key Learning Areas

Language Arts

- Verbal Discussion
- Reading Comprehension (through read-alouds)
- Informational Writing
- Narrative (Story) Writing
- Research Projects
- Editing and Revision

Science

- Scientific Observation
- Scientific Experimentation
- Engineering to solve a problem
- Scientific Communication

- Needs of Living Things
- Pollination
- Habitats

Social Studies

- Protecting honey bees:
Why do people need bees
- Planting bee-friendly flowers
and plants

- Vermicomposting:
Helping soil and plants

- Educational posters to help
inform the Helios community
about bees and worms