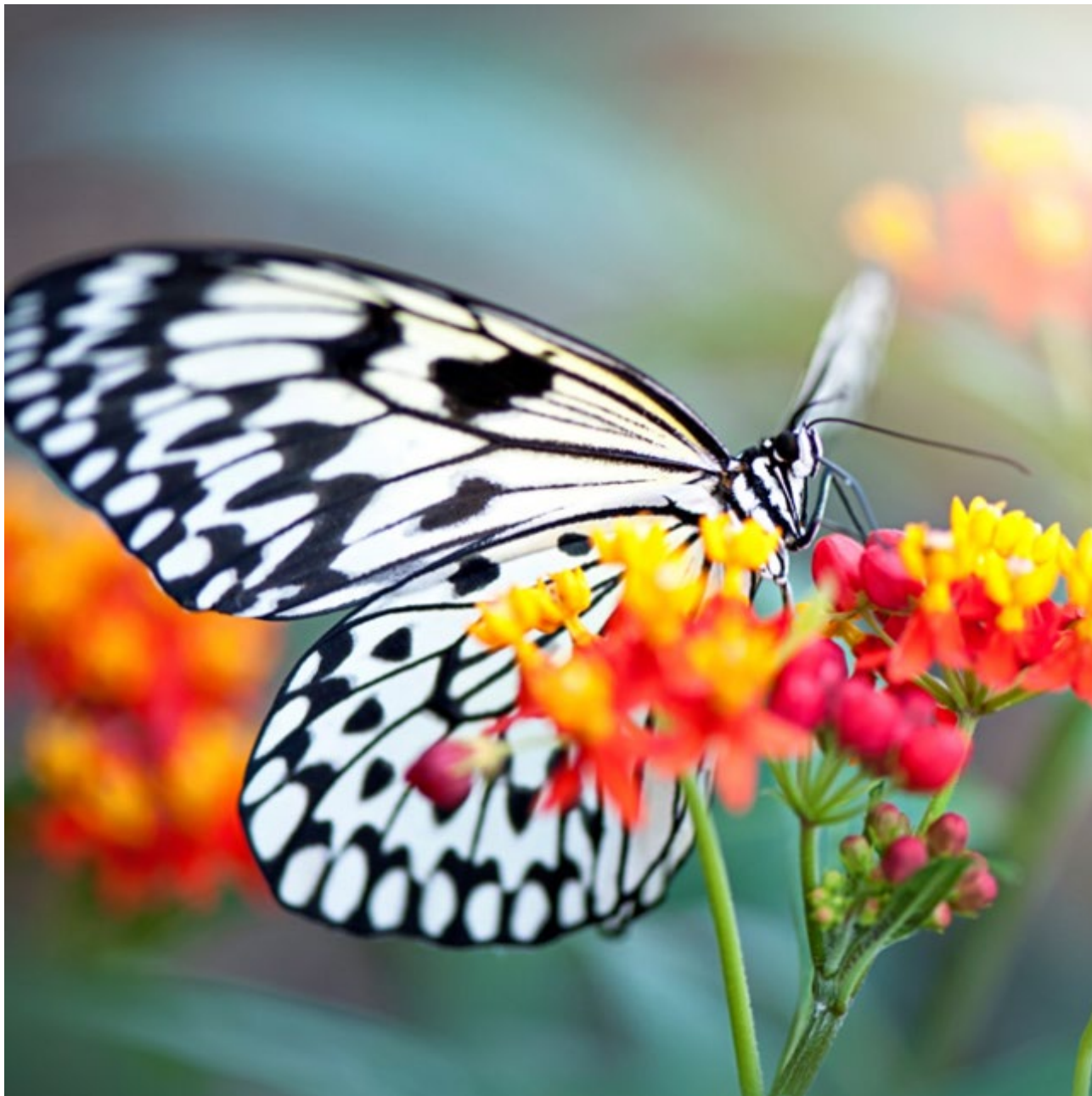


Plants and Insects Need Each Other

Grades 2-3

UCCE Master Gardener Program of Riverside County

Vetted by Riverside County Office of Education-STEM



Why Is This Important?

- Insects belong to the group of animals called **arthropods**. Arthropods represent the largest group of animals on our planet.
- **Flowering plants**, also called **angiosperms**, are the dominant land plant today.

Learning Goal

Students will learn how plants and insects depend on each other for survival.



Anchor Phenomena: Insects and Plants



Arthropod Insect Pollinators.mov

Teachers: Mute sound for initial student viewing of video



Develop a Model To Describe the Phenomena

Draw a diagram demonstrating why plants and insects need each other. Include both observable and unobservable details.

- Label all important parts of the diagram.
- Use arrows to show how all parts interact.
- Write an explanation describing why plants and insects need each other.



Plants

There are over 250,000 species of plants that flower!

- Can you name the plants in these pictures?
- What do all these plants have in common?

A close-up photograph of the stamens of a white flower. The stamens are yellow and covered in pollen, with some pollen grains visible on the white filaments. The background is a soft, out-of-focus green and white.

A Closer Look Inside a Flower

Inside the flower is [pollen](#) which is small, yellow, powdery grains.

- Plants need to spread this pollen within a flower and to other flowers.
- This is called ***pollination*** which is how plants reproduce.

Why Do Plants Need Insects? *Pollination*

Insects landing and crawling on flowers collect and spread the pollen from the male to the female parts of the plant.

- This will **pollinate** the flower which means it will make seeds.



[This Photo](#) by Unknown Author is licensed under [CC BY-SA](#)

Why Do Plants Need Insects? *Seed Spreading*

Plants also need insects to help spread their seeds to places where they can sprout.

- For example, ants collect and store seeds to eat.
- Some of these seeds will sprout in this soil before they are eaten.



How Do Plants *Attract* Insects?

Plants have developed strategies to attract insects.

- ✓ Shape
- ✓ [Nectar](#)
- ✓ [Scent](#)
- ✓ Flower colors and patterns
- ✓ Some plants even produce seeds with a special coating or parts that ants like!



Patterns show insects where to look for nectar. They may be visible only under [ultraviolet](#) light, which some insects can see.



Quick Check For Understanding

- What can be found inside a flower?
- What is pollination?
- Give one reason plants need insects.
- Describe a strategy plants use to attract insects.



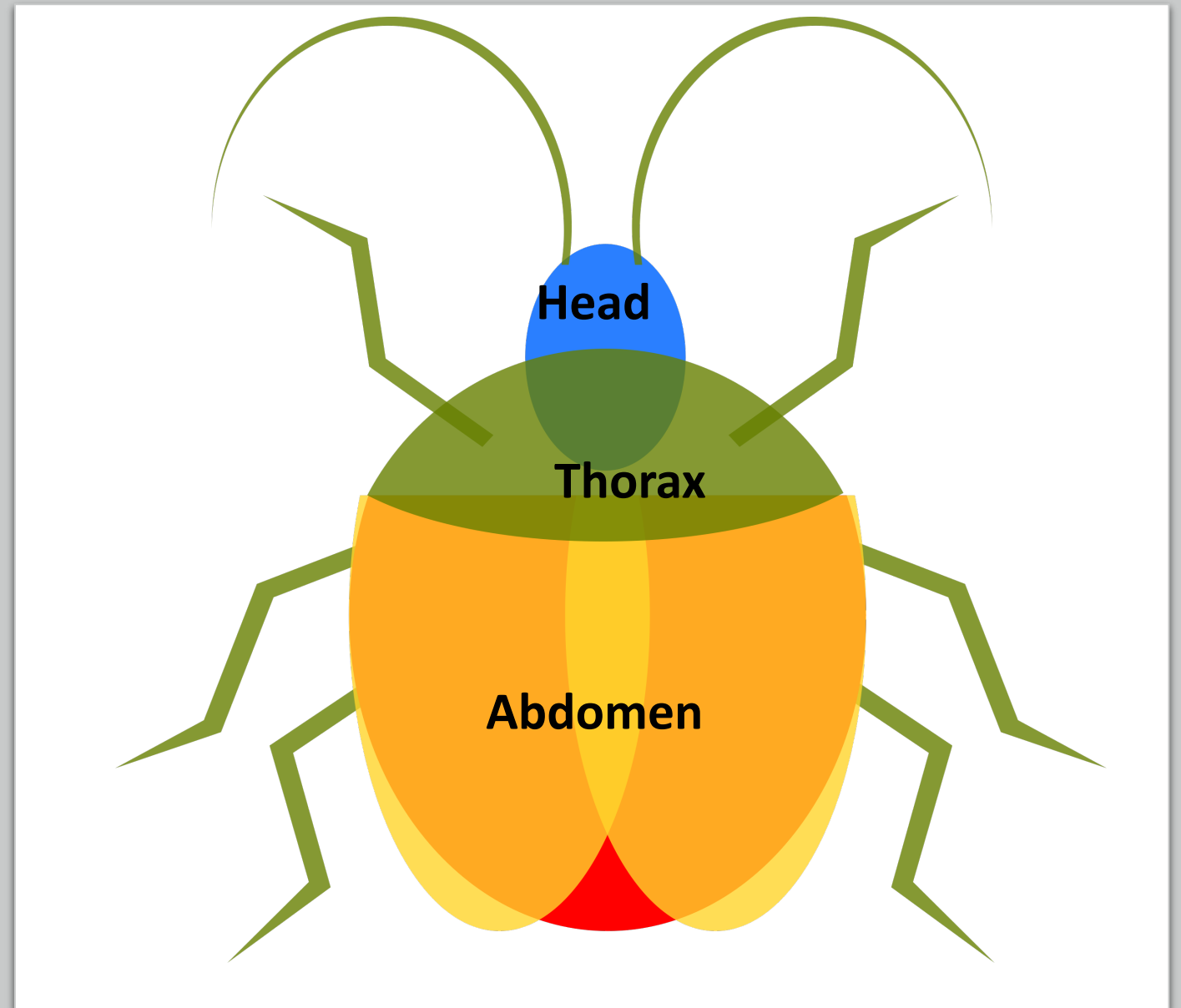
Insects

There are more than one million different kinds of insects!

- Can you name the insects in these pictures?
- What do all these insects have in common?

A Closer Look At Insects

- All adult [insects](#) have:
 - Three body parts
 - Head
 - Thorax
 - Abdomen
 - Six legs
 - Two antennae
- Many insects also have wings.



Why Do Insects Need Plants? *Food*

Plants provide food for insects inside their flowers.

- Pollen grains provide a nutritious protein.
- Nectar is a sugary liquid that provides energy.

Some insects also find other food to eat:

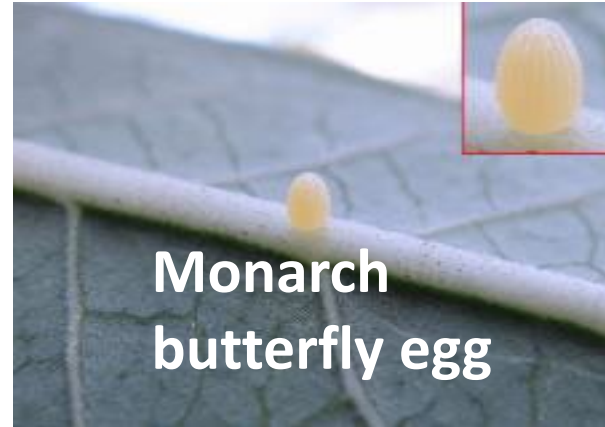
- A plant's roots, stems and leaves.
- Other insects on the plant!



Why Do Insects Need Plants? *Shelter*

The parts of a plant provide:

- ✓ A place for insects to lay their eggs.
- ✓ A place for larvae to develop.
- ✓ A place for adult insects to rest.



Where Do Insects Live?



Carpenter Ants



Japanese Beetle



Lady Beetle



Butterfly



Leafcutter

- **Leafcutter bees** live in nests made from leaves that they construct inside hollow wood.
- **Butterflies** sleep on plants.
- **Japanese and lady beetles** live where they eat, on leaves.
- Many **ants** live in colonies located in the ground and some live inside trees.



Quick Check For Understanding

- Name a part of an insect that helps it travel to plants.
- Give one reason insects need plants.
- What do you think is the most important reason insects need plants?

Revisiting the Anchor Phenomena: Insects and Plants



Arthropod Insect Pollinators.mov

Teachers: Turn sound on for second viewing



Phenomena In the Garden: Application Activity

Observe the plant-insect relationship in your school or home garden.

- Use a checklist to tally how many of each kind of insect you find on plants in the garden.
- Record which plants each insect is attracted to.
- Record where on the plant you observe the insect: Flower, stem, leaf.

(A checklist is provided on the next slide)

Insect-Plant Observation Chart

Insect Tally	Write the name(s) or describe the plant(s) on which you saw the insect	Record the part (s) of the plant where you observed the insect
Ants		
Bees		
Beetles		
Butterflies		
Flies		
Other: Write the name of the insect		



Develop a Model To Describe the Phenomena

Revise or draw a new diagram demonstrating why plants and insects need each other. Include both observable and unobservable details.

- Label all important parts of the diagram.
- Use arrows to show how all parts interact.
- Write an explanation describing why plants and insects need each other.

Extension Activity:

Insect Pollinators

Learn more about insects and their role as plant pollinators.

- Select an insect from this list.
- Read information provided through the link. (*Information can be printed as handouts.*)
- Add the new information you have learned to your diagram of *Why Plants and Insects Need Each Other.*

Pollinating Insects

Carpenter Ant

Leaf Cutter Bee

Monarch Butterfly

Ladybug

Flies

Vocabulary

Flower

Pollen

Nectar

Scent

Insects

Flower

- A flower is a special kind of plant part.
- The flower grows on a stalk which supports it.
- Flowers have petals.
- Inside the part of the flower that has petals are the parts which produce pollen and seeds



Pollen

- Small, yellow, powdery grains found inside a flower.
- Pollen is important for plants to reproduce.
- Pollen is a food rich in protein for bees and other insects.




Nectar

- A liquid made by the flowers of plants.
- It is sweet because it has sugar in it.
- Plants make nectar to attract pollinating animals including insects.



Scent

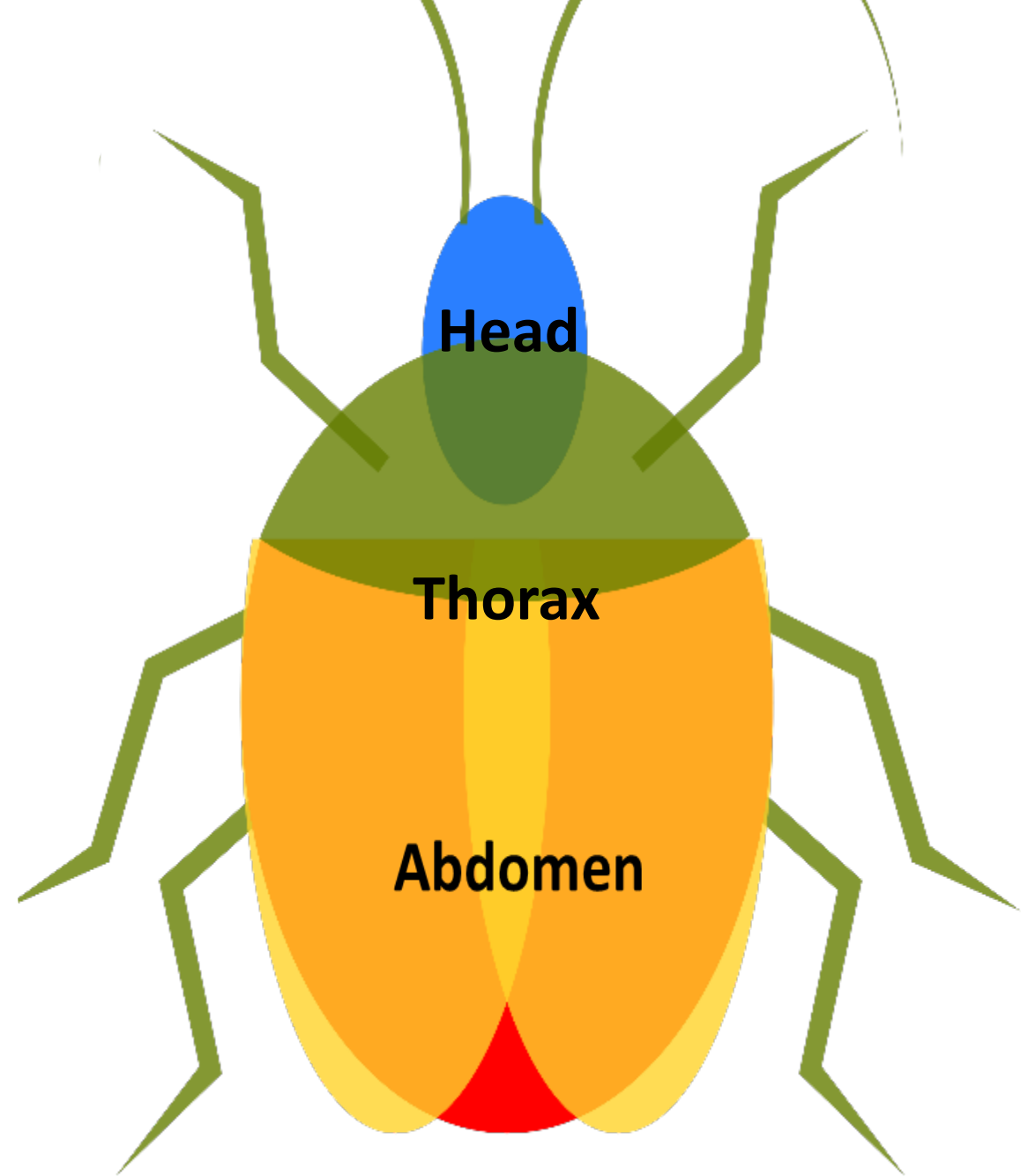
- Scent means a smell.
- Some scents have sweet aroma or smell.
- Some scents have an odor or smell that we might describe as “stinky”.



This flower emits a “stinky” scent that attracts flies.

Insects

- Insects belong to a group of animals called arthropods.
- Adult insects have three main body parts.
- Many insects have wings.



Next Generation Science Standards

Second Grade

LS4.D: Biodiversity and Humans ▪ There are many different kinds of living things in any area, and they exist in different places on land and in water. (2-LS4-1)

LS2.A: Interdependent Relationships in Ecosystems ▪ Plants depend on animals for pollination or to move their seeds around. (2-LS2-2)

Science and Engineering Practices

- Developing and Using Models Develop a simple model based on evidence to represent a proposed object or tool. (2-LS2-2)

Cross-cutting concepts

- Cause and Effect ▪ Events have causes that generate observable patterns. (2-LS2-1)
- Structure and Function ▪ The shape and stability of structures of natural and designed objects are related to their function(s). (2-LS2-2)
- Patterns ▪ Patterns in the natural world can be observed. (2-ESS2-2),(2-ESS2-3)

Next Generation Science Standards

Third Grade

- **LS3.A: Inheritance of Traits** ▪ Many characteristics of organisms are inherited from their parents. (3-LS3-1) Other characteristics result from individuals' interactions with the environment, which can range from diet to learning. Many characteristics involve both inheritance and environment. (3- LS3-2)
- **LS1.B: Growth and Development of Organisms** ▪ Reproduction is essential to the continued existence of every kind of organism. Plants and animals have unique and diverse life cycles. (3-LS1-1)
- **LS4.C: Adaptation** ▪ For any particular environment, some kinds of organisms survive well, some survive less well, and some cannot survive at all. (3-LS4- 3)

Next Generation Science Standards

Third Grade

- **Science and Engineering Practices**
- Developing and Using Models ▪ Develop models to describe phenomena. (3-LS1-1)
- Constructing Explanations and Designing Solutions ▪ Use evidence (e.g., observations, patterns) to support an explanation. (3-LS3-2)
- **Cross-cutting concepts**
- Systems and System Models ▪ A system can be described in terms of its components and their interactions. (3-LS4-4)
- Patterns ▪ Similarities and differences in patterns can be used to sort and classify natural phenomena. (3-LS3-1)
- Cause and Effect ▪ Cause and effect relationships are routinely identified and used to explain change. (3-LS3-2)

Resources

- California Master Gardener Handbook: Dennis Pittenger, ed., UCANR, 2015
- Kids Growing Strong: [Ladybug](#)
- Kiddle.Com: [Flower Facts for Kids](#)
- Learn About Nature: [The Butterfly Site](#)
- National Geographic Kids: [Ants](#), [Ladybugs](#), [Monarchs](#)
- National Wildlife Foundation: [Bees](#)
- [North American Butterfly Association](#)
- Pest World For Kids: [Carpenter Ant](#); [Flies](#)
- Science Direct: [Seed Insects](#)
- Smarty Plants: [Leaf Cutter Bee](#)

Resources (Continued)

- UCANR: [Join the Pollen Nation](#), [Japanese Beetle Repeatedly Eradicated from California](#)
- Videos: Professor Zurwaski, SciShow Kids
- Images: UCANR, The Joyful Learner, Kiddle.com, Creative Commons, Dreamstime.com, Stock Images, Britannica, Wikipedia
- Image: Euphorbia Cupularis 3 by Frank Vincent

Master Gardeners

The University of California Cooperative Extension (UCCE) Master Gardener Program (MGP) is an educational program designed to teach and effectively extend information to address home gardening and non-commercial horticulture needs in California.

UCCE is the outreach arm of UC's division of Agriculture and Natural Resources (ANR). Master Gardener volunteers (MG volunteers) promote the application of basic environmentally appropriate horticultural practices through UCCE-organized educational programs that transfer research-based knowledge and information.



University of California

Agriculture and Natural Resources

UCCE Master Gardener Program

Gardening Questions?

Email the UCCE Master Gardeners of Riverside County

- Email Helpline: anrmgriverside@ucanr.edu
- School Gardens: mgschoolgardens@gmail.com

Website Resources

- [Riverside Master Gardeners Website](#)



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