



# Friend or Foe?

*What is that creature in my garden?*

TK-1



*Vetted by Riverside County Office of Education-STEM*

# Teachers: Why Not Use The Term “*Bug*”?



“Bug” is a word often used to describe creatures found in the garden.

*True* bugs are actually a special group of insects, classified as [Hemiptera](#), which have mouthparts that are a beak with joints that enable the insect to pierce and suck the juices from plants or other creatures.

While entomologists reserve the term *bug* for Hemiptera, a colloquial understanding of the term bug is often applied to a broad category of creatures without backbones (Invertebrates) from several different animal phyla: [Arthropoda](#) (spiders and insects) [Annelid](#) (worms) and [Mollusca](#) (snails and slugs).

However, broadly using the descriptor “bug” can lead to confusion for students. Instead of using this informal term, this lesson uses the word *creature* and provides the correct name for each arthropod, annelid and mollusk example provided.

# Learning Goals

Students will learn:

- to identify some common creatures that can be found in a garden,
- and if the creature is considered helpful (friend) or harmful (foe) to plants.



# Anchor Phenomena: Creatures in My Garden



Insects in My Vegetable & Herb Garden

Draw a picture of a creature that helps plants  
and a creature that harms plants in the garden



**Helps Plants**

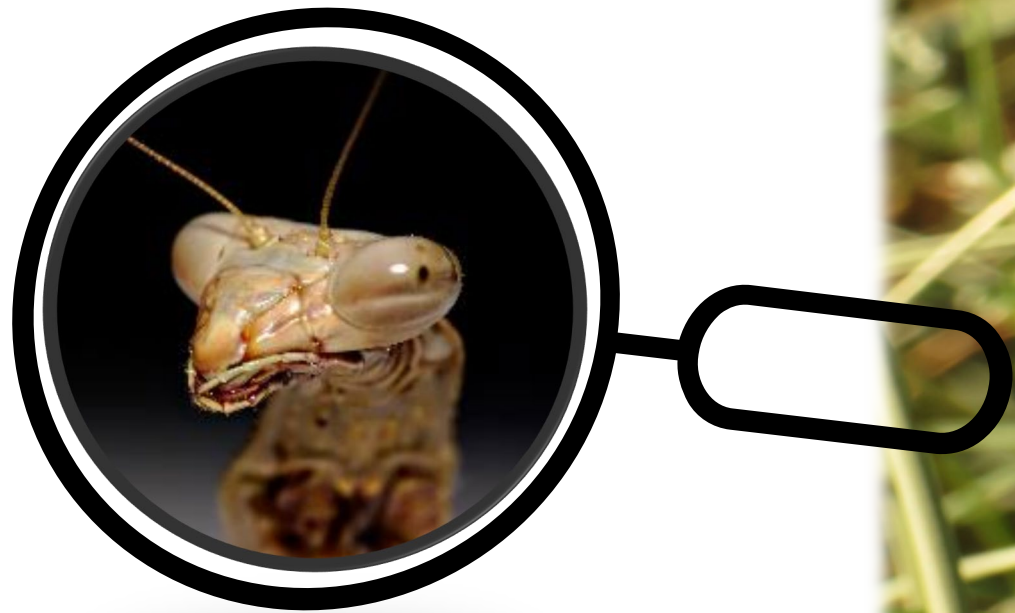
**Harms Plants**



# What is that creature in the garden?

Will it help the plants?

Will it harm the plants?





So many creatures  
in our garden!



How do we know if they are  
helpful or harmful to the plants?



# Helpful creatures behave in ways that protect plants!

That means they are friends to the garden plants!

These **friends** include some:

- [insects](#) and their [larvae](#)
- [spiders](#)
- earthworms





# Harmful creatures eat, weaken and even kill plants!

That means they are enemies or foes to your garden plants!

These **foes** include some:

- insects
- insect larvae
- snails and slugs



# Learn to identify your garden's friends and foes

Examples of Helpful Garden Friends



Examples of Harmful Garden Foes







Let's take a  
closer look  
at each of  
these  
creatures!



# Aphids are a harmful garden foe

Aphids feed on juices from the plant's stems and leaves.

## Effects on Plants: Foe

- Aphids can cause leaves to curl and affect plant growth.
- Aphids also leave honeydew on the plant as they eat which can attract ants.



# Cabbage worm is a harmful garden foe

A cabbage worm is the **larva** of the Cabbage White Butterfly. The larva can also be found on the leaves of cauliflower, broccoli, kale and brussel sprouts.

## Effects on Plants: Foe

- Cabbage worms will eat their way into the center of the plant.



# Hornworm is a harmful garden foe

A hornworm is the **larva** of the Hawk Moth. It can be found on tomato, eggplant and pepper plants. It will eat the leaves, stems and fruit of the plant.

## Effects on Plants: Foe

- Hornworms chew holes in the fruit and leaves.
- They can eat all a plant's leaves in just a few days!





# Mealybugs are a harmful garden foe

Mealybugs are small, wingless insects found on the leaves, stems and fruits of plants.

When there are a lot of them, it looks like white cotton on the plant.

## Effects on Plants: Foe

- Mealybugs suck the sap out of the plant causing leaves to turn yellow and curl.



# How can we protect our garden plants from these harmful pests?

Be sure your garden is home to helpful creatures.

Many of these garden friends will eat your garden's foes!

- For example, this mantis is a garden friend. It has caught a grasshopper, a garden foe, to eat.



Photo Credit: Chris Horne, bugwood.org

# Lacewings are a helpful garden friend

Green lacewing are found on the [nectar](#) and [pollen](#) from flowers and plants.

## Effects on Plants: Friend

- Lacewings lay eggs which grow into larvae. The larvae eat aphids, whiteflies and caterpillars.
- A single larva can eat up to 600 garden foes in two weeks!





# Lady Beetles are a helpful garden friend

Lady beetles are attracted to the pollen in flowers.

## Effects on Plants: Friend

- Lady beetle adults and their larvae help plants by eating harmful insects including aphids and mealybugs.



# Orb Spider is a helpful garden friend

Orb spiders make their webs anywhere outside in lights, trees, bushes and tall grasses.

They are very peaceful and will run off at the first sign of a threat.

## Effects on Plants: Friend

- Orb spiders eat many harmful garden insects.
- They are most active during the night, eating insects trapped in their webs.





# Earthworms are a helpful garden friend

Earthworms are found in damp, loose soil. They can also be found in leaf litter.

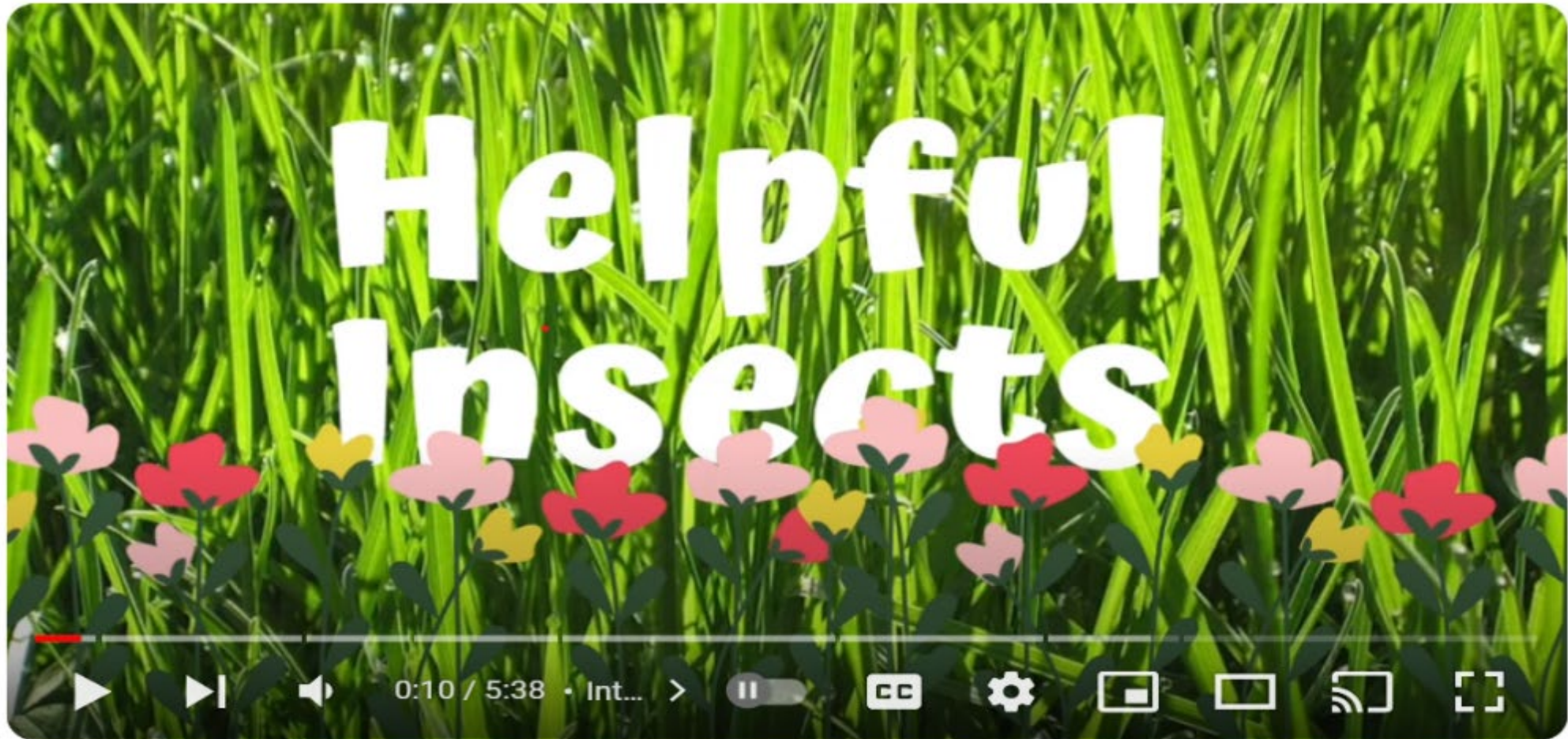
## Effects on Plants: Friend

- Earthworms don't eat foes, but they do improve the soil. Their tunnels bring air into the soil and their droppings make fertilizer for plants.





## Video: Helpful Garden Creatures



# Check For Understanding

- What are helpful garden creatures called?
- What are harmful garden creatures called?
- Give an example of a helpful garden creature.
- Give an example of a harmful garden creature.
- The video showed other examples of helpful garden creatures. Name one of these and explain how it is helpful.
- Which of these creatures would you like to learn more about? Explain why.



# *Phenomena in the Garden:*

## Do you know what creatures live in your garden?

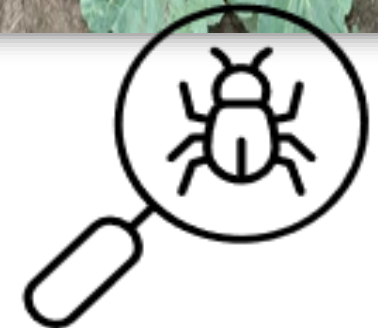
**Carefully and quietly walk through your garden observing plants, leaves, soil and nearby structures for:**

- Insects and their larvae
- Spiders and their webs
- Worms in the soil
- Snails and slugs

**Do not touch or remove a creature** without your teacher's permission!









**Circle any examples you find** on the recording sheet. (See next slide).

**Optional:** In the blank squares, write the names of creatures you find that are not pictured on the chart. Observe their behavior and decide if they should be listed in the friend or foe square.





# Circle the creatures you found in your garden

<p>Beneficial: Helpful Friend</p>	<p>Earthworm</p> 	<p>Lacewing</p> 	<p>Lady Beetle</p> 	<p>Orb Spider</p> 
<p>Pest: Harmful Foe</p>	<p>Aphids</p> 	<p>Cabbage Worm</p> 	<p>Hornworm</p> 	<p>Mealy Bugs</p> 

Draw a picture of a creature that helps plants  
and a creature that harms plants in the garden



**Helps Plants**

**Harms Plants**

# ***Extend Your Understanding:***

## **Plant flowers to attract more garden friends**

Many helpful creatures are attracted to the nectar and pollen found in flowers. These creatures will visit and even live in your garden if a variety of blossom types and plant sizes are blooming throughout the growing season.

- **Lacewings** and **lady beetles** are attracted to many of the same flowers.
- With the help of your teacher, learn more about these flowers and identify some to grow in your garden.



[alyssum](#)

[angelica](#)

[buckwheat](#)

[coriander](#)

[dill](#)

[fennel](#)

[Queen Anne's lace](#)

[sunflowers](#)

[yarrow](#)



# Vocabulary

- Insect
- Larva/Larvae
- Nectar
- Pollen
- Spider

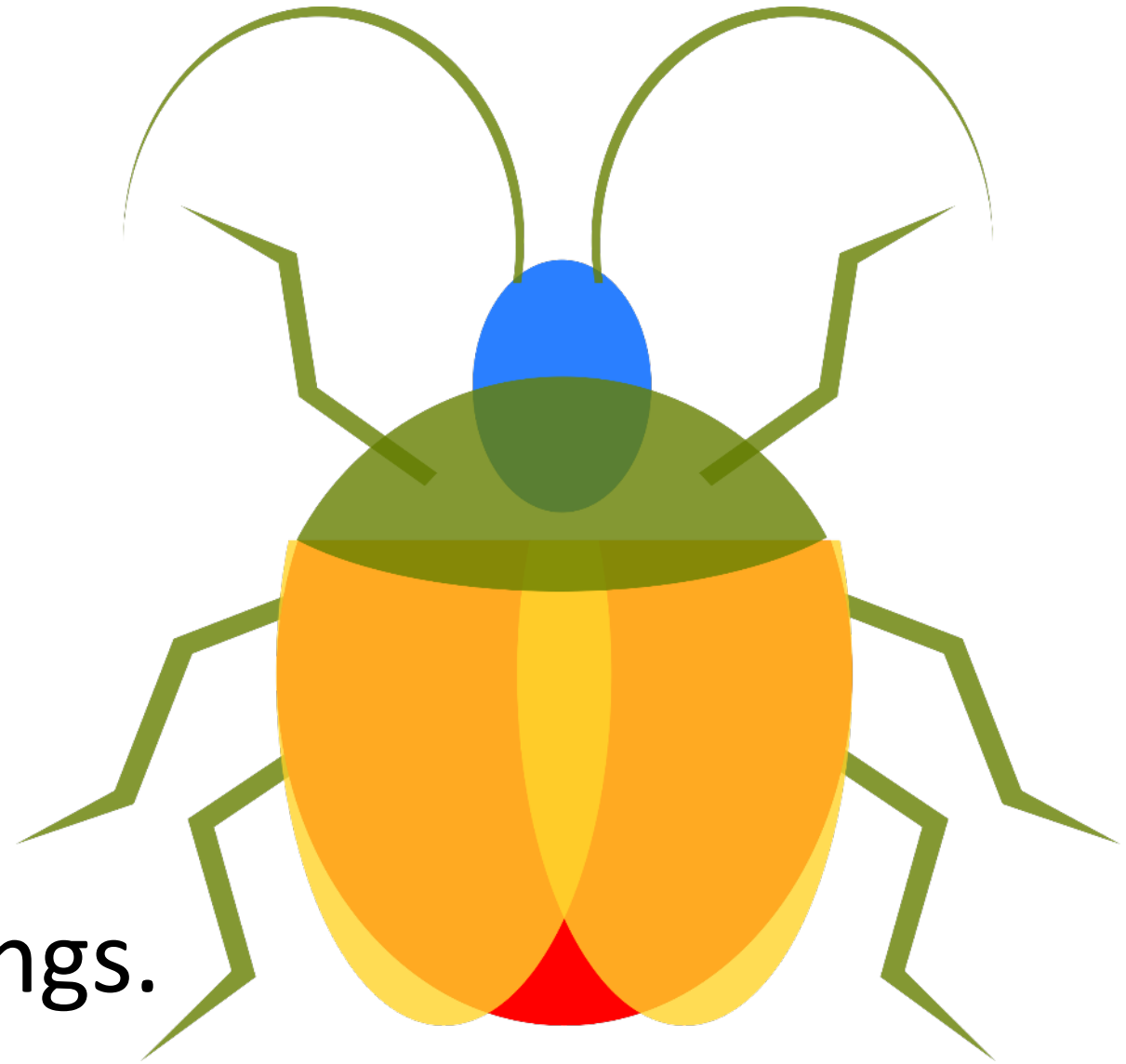


# Insect

All adult insects have:

- 3 body parts
- 6 legs
- 2 antennae

Many insects also have wings.



# Larva

Insects develop in separate stages.

- A larva does not look like the adult animal and changes shape as it develops.

(Plural is spelled larvae)





# Nectar

Nectar is a liquid made by the flowers of plants.

- It is sweet because it has sugar in it.
- Plants make nectar to attract insects and other creatures such as birds.



# Pollen

Pollen is produced by flowers.

- It is a very small, yellow grain full of protein.

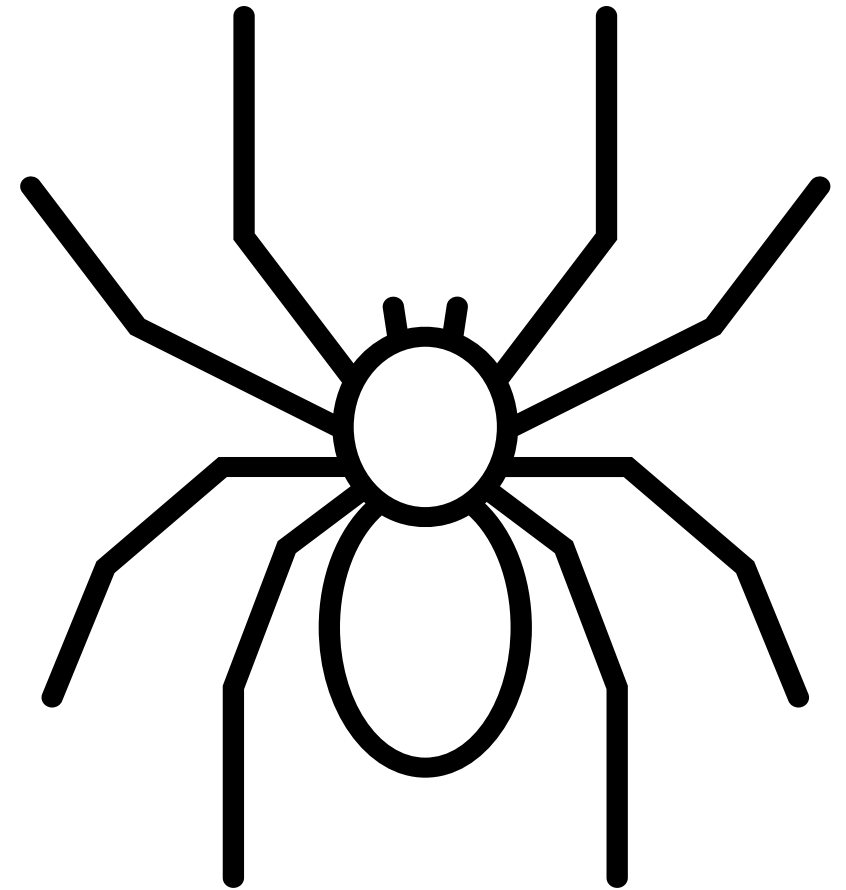


# Spider

All spiders have:

- 2 body parts
- 8 legs
- Fangs that inject venom

Most spiders make silk.





# Teachers: Please Provide Your Input!

Master Gardeners would appreciate your feedback on this lesson. The survey is anonymous but does require a Gmail account to access.

Please click on the link to complete a brief survey.

[MG Lesson Survey](#)



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# California Preschool Learning Foundations

## California Next Generation Science Standards

### Preschool Life Science Strand

At around 60 months:

2.2 Develop a greater understanding of the basic needs of humans, animals, and plants (e.g., food, water, sunshine, shelter).

1.1 Identify characteristics of a greater variety of animals and plants and demonstrate an increased ability to categorize them.

### Kindergarten Life Sciences

**LS1.C: Organization for Matter and Energy Flow in Organisms** ▪ All animals need food in order to live and grow. They obtain their food from plants or from other animals. (K-LS1-1)

**ESS2.E: Biogeology** ▪ Plants and animals can change their environment. (K-ESS2-2)

# California Next Generation Science Standards

## First Grade

- **LS1.A: Structure and Function** ▪ All organisms have external parts. Different animals use their body parts in different ways to see, hear, grasp objects, protect themselves, move from place to place, and seek, find, and take in food, water and air. Plants also have different parts (roots, stems, leaves, flowers, fruits) that help them survive and grow. (1-LS1-1)
- **LS1.D: Information Processing** ▪ Animals have body parts that capture and convey different kinds of information needed for growth and survival. Animals respond to these inputs with behaviors that help them survive. (1-LS1-1)



# California Next Generation Science Standards

## Science and Engineering Practices:

- Use a model to represent relationships in the natural world. (K-ESS3-1)
- Obtaining, evaluating, and communicating information in K– 2 builds on prior experiences and uses observations and texts to communicate new information. ▪ Read grade-appropriate texts and use media to obtain scientific information to determine patterns in the natural world. (1-LS1-2)

## Cross-Cutting Concepts:

- Systems and System Models ▪ Systems in the natural and designed world have parts that work together. (K-ESS3-1)
- Structure and Function ▪ The shape and stability of structures of natural and designed objects are related to their function(s). (1-LS1-1)
- Patterns in the natural world can be observed, used to describe phenomena, and used as evidence. (1-LS3-1)

# Resources

- [Good Bugs-Bad Bugs](#): Cleve Campbell, Piedmont Master Gardeners, Virginia Cooperative Extension
- [Good Bug, Bad Bug Lesson Plan](#): Wisconsin State University Extension Master Gardeners
- Kiddle.com
- [Encourage Pollinators and Beneficial Insects](#): Kids Gardening
- [The Best Flowers to Attract Predator Beneficial Insects to Your Garden](#): Grow Organic
- [Meet the Beneficials: Natural Enemies of Garden Pests Poster](#): University of California Integrated Pest Management
- [Who Knew? Bugs to the Rescue](#): Lisa Kilders, Clackamass County Water District
- Wikipedia
- Images: Chris Home-bugwood.org; Creative Commons; Stock; UCIPM
- Videos: Rainbow Gardens, Children's Hands-On Museum of Tuscaloosa

# 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.



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# Gardening Questions?

## UCCE Master Gardeners of Riverside County Contact Information

**Email Helpline:** [anrmgriverside@ucanr.edu](mailto:anrmgriverside@ucanr.edu)

**Website:** [Riverside County Master Gardeners](#)



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