





## Instructions

### 1. Insects

- What is an insect?
- What is the role of insects? Remind students that fruit is formed from flowers that are pollinated. In an orchard this is done by a range of insects.
- How are insects useful in an orchard? Are there any insects that could harm the fruit or fruit trees in the orchard? (See background information on insects at the end of this resource.)
- What insects do you know that are great pollinators? The most well-known of these is the honey bee, but a surprising number of other insects also do this – some moths, flies, beetles, butterflies, wasps and sometimes even ants.
- Where do you think they live?
- What do you think they need?

### 2. Habitats

- What's the name for the different types of place that insects (or other animals or plants) live?
- Can you see any habitats from here?
- Discuss the types of habitats you can find in your schoolyard, e.g. grassland, wetland or swamp.
- What does a habitat need?
- Let the student know that they will be going outside to investigate the habitats to discover which insects are living there.

### Exploring habitats

Divide the students into small groups and hand out the common insect identification guides/app. Discuss the characteristics of each of the insects and their names, so students are familiar with what they are looking for before they go outside. Let the students know they are going on a hunt for habitats. They are going to discover which insects are living in the school grounds. Students will be looking for insects and evidence of them being there.

1. Ensure each group has the correct materials (magnifying glass, clipboard, worksheet and pencils).
2. As a whole class, walk to an area of habitat in the school grounds.
3. Show all students how to carefully turn leaves over and look at the leaves to see evidence of invertebrates (invertebrates are animals without a backbone).
4. Demonstrate how you look on the bark and under the tree. Using the Rockstar Bug worksheets, students explore the habitat and draw an insect. After 10–15 minutes call students back together and ask them how they did.
5. Did you find any pollinating insects, or evidence of them? Why do you think that is? Where do you think they are at this time of year? Some bees hibernate as colonies but may come out to forage if it's warm enough. In the spring the adults come out to look for food. Bees need an almost year-round supply of nectar, and solitary bees need somewhere to shelter.
6. Once students have returned to the classroom with their Rockstar Bug habitat completed, commence the Rockstar Bug art activity.

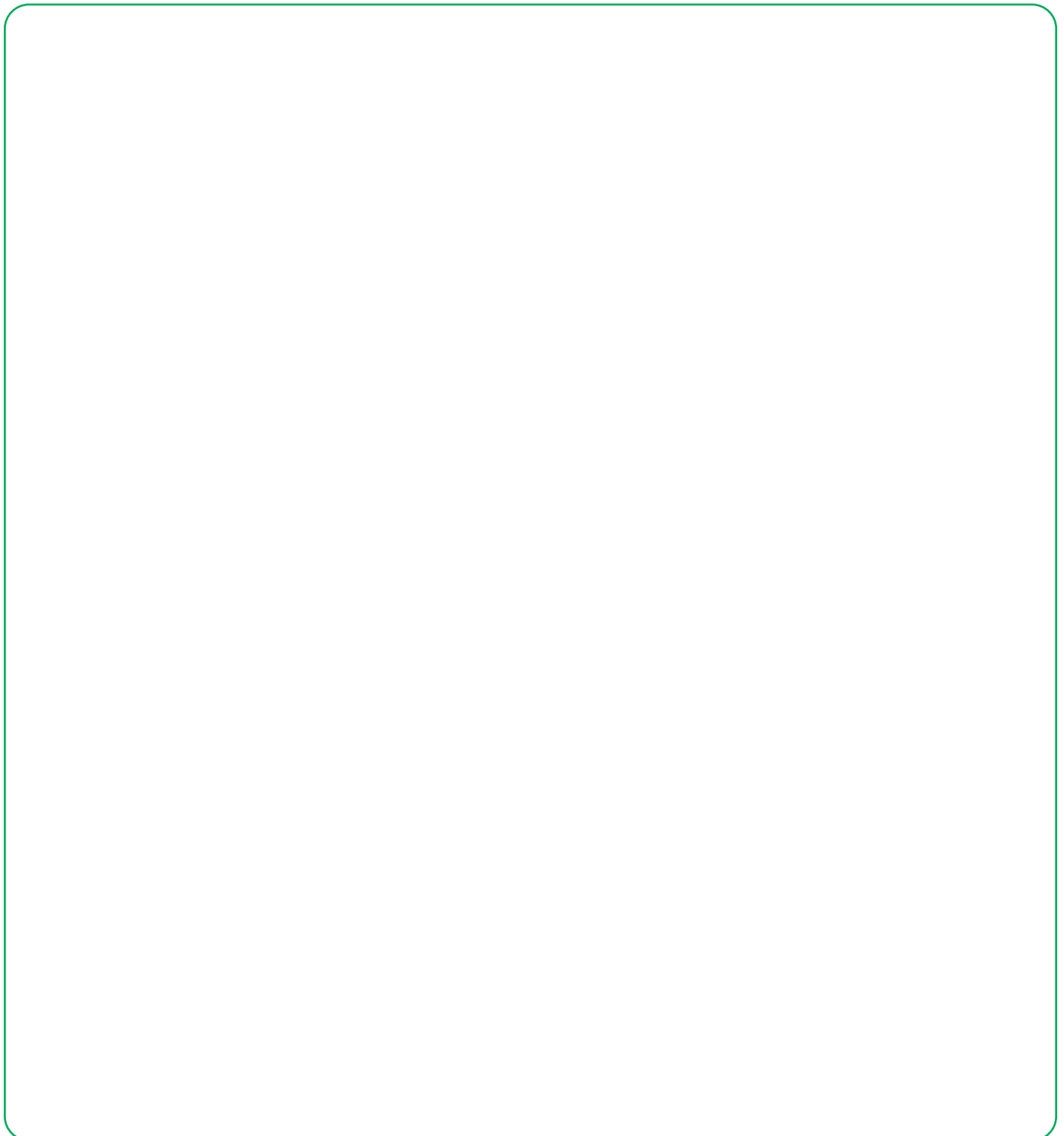


## Worksheet: Rockstar Bug

Using a handheld magnifying glass, explore the natural areas of habitat in your school grounds. Insects are excellent at hiding, look in areas where there are trees, fallen leaves, grasses or spider webs.

**Safety:** If you are unsure about the type of insect you have found, investigate with your eyes rather than your hands!

Draw your insect in its natural habitat.



## Background information

### Pest insects

**Fruit flies** are serious pests that can infest many types of fruit and fruiting vegetables. Damage is caused by the female laying eggs in unripened or ripe fruit. The hatched larvae then eat the fruit from the inside, causing it to rot. In addition to their potential to severely damage fruit, their presence imposes restrictions on interstate and international export markets.

There are two species of fruit fly in Australia.

The **Queensland fruit fly (Qfly)** is about 7mm long and has a reddish-brown thorax with distinct yellow markings, and a dark brown abdomen. Qfly is an Australian native species occurring in the Northern Territory, Queensland, New South Wales and Victoria.



Queensland fruit fly

The **Mediterranean fruit fly (medfly)** has a light brown body and mottled wings. An adult medfly is smaller than a Qfly, measuring 3–5mm long. It is an introduced species and is mainly found in Western Australia. There have been detections of medfly in South Australia. These have been contained within defined outbreak areas and South Australia undertakes eradication activities to ensure medfly does not become established.



Mediterranean fruit fly. Photo: Scott Bauer, USDA Agricultural Research Service, Bugwood.org

Reference: Agriculture Victoria and <https://www.preventfruitfly.com.au/understanding-fruit-fly/pest-species/>

**Woolly apple aphid** is a serious pest of apple production in all Australian fruit growing regions. It can affect all parts of the tree resulting in direct damage to fruit, limbs, roots and gradual decline in tree health.



Woolly apple aphid mummies. Photo: Agriculture Victoria

**Codling moth** is the principal insect pest of pome fruit (apples and pears) in Victoria and is a major pest in all Australian apple and pear growing regions except Western Australia, where codling moth is not present. The larvae (caterpillars) need to feed on fruit to survive to maturity. They are highly dependent on fruit as a food source and thus have a significant impact on crops. If not controlled, almost the entire crop can be affected.



*Codling moth adult. Photo: Whitney Cranshaw, Colorado State University, Bugwood.org*



*Codling moth larva. Photo: Gyorgy Csoka, Hungary Forest Research Institute, Bugwood.org*



*Codling moth damage to an apple. Photo: Agriculture Victoria*

Reference: Agriculture Victoria

## Beneficial insects

Beneficial insects are any insect that assists in pest control or pollination without harming humans, plants, or pets. Many organic growers rely on beneficial insects as an alternative or complementary method of pest control rather than using pesticides.

**Trichogramma wasps** are one of the many varieties of beneficial parasitic wasps, ranging from tiny sizes no longer than one millimetre to wasps about an inch long. Parasitic wasps need to find a host to complete their metamorphosis. This will vary depending on the type of wasp, but many will use caterpillars, paralyse their host and then lay their eggs in or on them. When the egg hatches into a larva, the larva will feed on its host until it is ready to pupate, by then the host is either dead or moribund. Adult wasps mostly feed on nectar from flowering plants, so good pollinator plantings are the key for retention. Trichogramma are a very tiny wasp species that are an effective control for codling moth, a common pest for apples, pears and sometimes peaches and plums.



*Female Trichogramma on an armyworm egg. Photo: Dr Victor Fursov*

**Ladybird beetles** are voracious predators of aphids, the soft-bellied pests that suck the juice out of plant leaves. Ladybirds will also eat mites and scales, other types of pests in the orchard.



*Common spotted ladybird. Photo: Louis Tedders, USDA Agricultural Research Service, Bugwood.org*

**Lacewings** are tiny green or black insects with clear, lacy wings that commonly fly around at dusk. Their larvae are known as “aphid lions”, but they also eat a wide variety of orchard pests including scales, mites, moth eggs and small caterpillars. Australia’s largest group of lacewings are the antlions (around 250 species) which are particularly common in arid and semi-arid areas. Adult and larval lacewings are mostly predators.



*Lacewing. Photo: Whitney Cranshaw, Colorado State University, Bugwood.org*

**The Stethorus beetle** is a tiny (2mm diameter), jet-black ladybird beetle. The larvae of this beetle has dull grey hairs, giving them a velvety appearance. The Stethorus beetle is a voracious feeder on many species of mites and is particularly effective against two-spotted mite. It is likely to suppress mite populations if it is present at high enough levels early in the cropping season.



*Stethorus beetle. Photo: Sonya Broughton, Department of Agriculture & Food Western Australia, Bugwood.org*

*Reference: [www.fgv.com.au/grower-services/latest-updates/technical-articles/464-find-out-about-beneficial-insects-in-the-orchard](http://www.fgv.com.au/grower-services/latest-updates/technical-articles/464-find-out-about-beneficial-insects-in-the-orchard)*

