



## Ants

A simple ant-farm can be set up in a large, wide-mouthed glass jar part filled with soil. Some of the subterranean galleries will usually be visible through the glass walls provided the lower half of the bottle is normally kept covered with a thick sleeve of paper to provide a dark environment. A more complicated ant farm can be made with a layer of soil between two sheets of glass separated by narrow slats of wood and held together by rubber bands or bulldog clips. Any of the small species of household and garden ants is suitable for these small set-ups. Simply dig up the whole nest area with a trowel and add to the container – the ants will sort themselves out in a couple of days.

An artificial diet for feeding ants is as follows:

- 1 egg
- 60 ml honey
- 1 drop of a vitamin and mineral supplement
- 5 gm agar
- 500 ml water

Dissolve the agar in 250ml boiling water. Let cool. Mix 250ml cold water, honey, vitamins & minerals and egg until smooth. Add the agar solution to this mixture, stirring constantly. Pour into petri dishes to set (0.5-1cm deep). Store in the refrigerator. The recipe fills four 15cm diameter petri dishes, and is jelly-like in consistency.



## Native bees

The only native social bees in Australia are the small black sting-less species of *Trigona* and *Austroplebia*. Nests in dead limbs are often revealed when trees are felled. They can easily be set up in a portable hive by transferring the comb and as many bees as possible into a wooden box with an entrance hole at the base. With a little ingenuity a hinged lid can be fitted so that the internal working of the hive can be inspected. These bees are perfectly harmless and such a hive could even be kept on a school verandah

## Aquatic insects

Many bottom dwelling insects from flowing streams are difficult to keep in aquaria because of the necessity for high oxygen level and water movement, but many of the insects of standing pools keep well in aquaria. Those, such as water beetles and water bugs, which come to the surface to breathe, are ideal because they are reasonably independent of water oxygen levels.



## Butterfly caterpillars

The caterpillars of many butterfly species are easily reared to adults on fresh foliage of the correct food plant for each species. Hold the foliage in a bottle of water but make sure the neck of the bottle is stuffed with paper towel to stop the caterpillars drowning in the water. Easy species to start with are Orchard Swallowtails on citrus or Wanderers on milkweed foliage.



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## Field crickets

These large crickets of the genus *Teleogryllus* are easily reared on a diet of dried dog food pellets and lettuce. The males sing pleasantly by rubbing their wings together. The females lay eggs into containers of sand. A small species of cricket can also be purchased from pet shops.



## Giant burrowing cockroaches

Queensland has the largest cockroach in the world – a slow-moving, subterranean beast from North Queensland called *Macropanesthia rhinoceros*. They live for up to 7 years in a container of sand with an occasional handful of dried leaves for food and a misting of water for moisture. They can be handled safely by the smallest child. They bear live young and breed well in captivity. Schools in the north may be able to dig their own stock from suitable areas, e.g. near Mareeba, Mt Garnet, Cooktown, and Townsville. There is an excellent, illustrated article on these cockroaches in Australian Geographic No. 18 (Apr-June 1990).



## Grasshoppers and locusts

During warmer months, grasshoppers are common and adapt well to culturing in reasonably large cages. The common large shrub-feeding species in suburban areas is the Hedge Grasshopper, *Valanga irregularis*. It feeds mostly on shrubs and particularly favours *Acalypha*, *Hibiscus* and *Bauhinia*; palms are also often attacked. Another large grasshopper is the Spur-throated Locust, *Nomadacris guttulosa*, but this species feeds mostly on grasses. They specimens for other class activities with grasshoppers are much

harder to catch and culture than *Valanga*. The breeding pattern for the Hedge Grasshopper is that adult grasshoppers over winter in concealed places. With the first warm days of October they emerge from hiding, mate and lay eggs in areas of bare soil. The eggs hatch in December to nymphs which feed voraciously and develop to a new generation of adults by about February-March. The flightless nymphs of *Valanga* are easily caught and live well in cages, moulting progressively to adults. All that is needed is a regular supply of suitable foliage held in water. Occasionally misting the foliage with water supplies all the moisture needed. Females will deposit eggs in a container of soil tamped hard. A cage of grasshoppers can be used for direct observation or can be drawn upon as periodic source of fresh.



## Harlequin bugs

These attractive sap-sucking bugs (*Tectocoris diophthalmus*) feed on various plants in the family Malvaceae including cotton, hibiscus and, especially, the native cotton tree which grows on foreshores. They can be kept alive on a potted hibiscus plant and are ideal for the walking experiment described elsewhere.



## Meal worms

Meal worms are larvae of beetles. Several species are sold by pet shops. The best for class purposes is the larger *Tenebrio molitor*, which is one of the minor pests of stored food stuffs. They breed well in dry processed grains such as bran, poultry food, breakfast cereals and can be cultured semi permanently in a large plastic box with a perforated lid. An occasional piece of carrot or fruit skin should be added to give a moisture source for the adults. Eggs, larvae, pupae and adults occur dispersed through the food material and can be sifted out.



## Milk weed bugs

Several red and black species of the sucking-bug family Lygaeidae live in the opening pods of milk weed plants and feed on the seeds. These can easily be collected alive in great numbers by shaking infested plants into a container. They are easily maintained in large Petri dishes or in kitchen canisters on a diet of sunflower seeds with water provided on wet cotton wool. Their bright colour is a warning to birds that they have absorbed the toxins from their food plant.



## Mosquitos

A simple way to illustrate insect metamorphosis is to breed mosquitoes in a glass jar. All stages are easily observable and the complete life history is passed in a couple of weeks in summer. Simply expose a jar of water containing a bit of vegetation (grass clippings) in a shady spot and mosquitoes will soon lay eggs. The jar can then be brought inside for observation. The species most likely to be obtained in this manner is *Culex annulirostris*.



## Silkworms

Silkworms are an easy way to demonstrate metamorphosis from egg to larva to pupa to adult. Eggs are laid by moths from the spring-summer generation and over-winter. Next spring they hatch when the mulberry trees put out their new leaves. Eggs can be prolonged in hibernation by keeping them in the refrigerator. They hatch within a fortnight of being removed from the cold. Silkworm eggs and caterpillars are often available from pet shops in spring.



## Stick insects (phasmids)

Large species occur in some suburban areas. They live very well in cages supplied with suitable foliage. Most will accept wattle or eucalypt foliage which should be held in water. The female phasmids lay copious eggs (not to be confused with their similar-looking droppings) which hatch to give a new generation.

