



CARING FOR ANIMALS

A GUIDE FOR TEACHERS,
EARLY CHILDHOOD
EDUCATORS, AND STUDENTS

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Foreword

In 1981, the former Department of Education published a guide for teachers entitled *Keeping Small Animals in the Classroom*. This illustrated manual outlined the needs of various vertebrates and invertebrates as defined by the law at that time.

Recent legislative changes have placed new restrictions on the use of animals in schools and early childhood education centres. The Animals Protection (Codes of Ethical Conduct) Regulations 1987 have been superseded by the Animal Welfare Act 1999, and the 'duty of care' of animals is the paramount feature in this new legislation.

This publication updates *Keeping Small Animals in the Classroom* so that both the ethical and the legal obligations for boards of trustees, teachers, early childhood educators, and students are clearly explained, whether they are manipulating (as defined in the legislation) or just observing animals. The guide also outlines the needs of various vertebrates and invertebrates to ensure that they are kept healthy and well cared for.

Contact with animals provides a wealth of experiences for all. All contributors to this publication firmly believe that if people learn to care for animals, those people will be better placed to care for each other. This guide gives those in positions of responsibility the necessary information to provide enriched learning opportunities for students and other children.

I would like to thank everyone who contributed resources and expertise to support the preparation of this publication, including the Animals in Schools Education Trust (AASET), which is a charitable trust established by the New Zealand Veterinary Association, the Australian and New Zealand Council for the Care of Animals in Research and Teaching (ANZCCART), and officials from the Ministry of Agriculture and Forestry.

Elizabeth Eppel

Group Manager
Ministry of Education

Introduction

The role of animals in ECE centres and schools

Animals are brought into school classrooms or early childhood education (ECE) centres for a number of reasons. These include:

- for display as loved pets
- as classroom or centre pets
- for school or ECE centre pet days
- for science or biology teaching
- for science fair projects
- to encourage classmates to share their interest in living things.

The use of animals in New Zealand is governed by various laws. The purpose of this publication is to ensure that teachers, early childhood educators and managers, boards of trustees, students, and young children are aware of their responsibilities and have the information necessary to care for their animals properly and according to the law.

There are advantages for young children and students in acquiring a knowledge of animals in their formative years.

Animals of all kinds play an important part in the lives of people and attitudes towards other animals depend to a great extent on knowledge acquired in the formative years. If students (and young children) are encouraged, under sympathetic guidance, to study, handle and look after animals they should develop a positive, concerned attitude (sic). For many children, (an ECE centre or) a school may be the only place where this experience can be gained and where respect for animals can be learned. Animals in (ECE centres and) schools provide a number of educational benefits linked to the New Zealand Science Curriculum including:

- opportunities for detailed observation and investigation of the animal way of life, animal structure, behaviour, growth and life histories.
 - [New Zealand Curriculum Science L1/2](#) : Life processes – Recognise that all living things have certain requirements so they can stay alive. Ecology - Recognise that living things are suited to their particular habitat. Investigating in science – Extend their experiences and personal explanations of the natural world through exploration, play, asking questions, and discussing simple models.
- identification and investigation of the normal range of environmental factors influencing living animals emphasising an appreciation of the importance of environmental protection.
 - [New Zealand Curriculum Science L3](#) : Ecology – Explain how living things are suited to their particular habitat and how they respond to environmental changes, both natural and human induced. Investigating in science – Build on prior experiences, working together to share and examine their own and others' knowledge. Participating and contributing – Use their growing science knowledge when considering issues of concern to them.
- contributions to the personal development of students (and young children) by shared responsibility for animal welfare, establishment of caring attitudes, and introduction to potential life-long interests involving animals.
 - [New Zealand Curriculum Science L3](#) : Participating and contributing – Use their growing science knowledge when considering issues of concern to them.
- contributions to the social education of children through observations of animal behaviour and discussion of reproduction, social interactions and life history – leading to an appreciation of the material and social needs of animals – including human beings.
 - [New Zealand Curriculum Science L1/2](#) : Life processes – Recognise that all living things have certain requirements so they can stay alive. Ecology – Recognise that living things are suited to their particular habitat. Investigating in science – Extend their experiences and personal explanations of the natural world through exploration, play, asking questions, and discussing simple models.)

- stimulation to do creative work and encourage the aesthetic appreciation of animals
- contributions to the personal development of students (and young children) by shared responsibility for animal welfare, establishment of caring attitudes, and introduction to potential life-long interests involving animals.
 - [New Zealand Curriculum Science L3](#) : Participating and contributing – Use their growing science knowledge when considering issues of concern to them.)

Ethics and the law

The content in this section describes the law relating to animals.

New Zealand Association of Science Educators, *Code of Ethical Conduct for the Use of Animals for Research, Testing and Teaching*.

 [Code of ethical conduct for the use of animals](#) (PDF 2 MB)

The Animal Welfare Act 1999

The Animal Welfare Act 1999 governs the welfare of animals in New Zealand. It applies specifically to vertebrate animals (including fish), octopuses, squids, crabs, lobsters, and crayfish, but the general principles should also be applied to other species of animals kept in classrooms. It also includes any mammalian foetus or any avian or reptilian pre-hatched young in the last half of its period of gestation or development. It excludes human beings.

The Act requires 'owners of animals, and persons in charge of animals, to attend properly to the welfare of those animals'. This can be done by ensuring that an animal's physical, health, and behavioural needs are met by:

- providing it with proper and sufficient food and water
- providing it with adequate shelter
- providing it with the opportunity to display normal patterns of behaviour
- handling it physically in a manner that minimises the likelihood of unreasonable or unnecessary pain or distress
- protecting it from and rapidly diagnosing any significant injury or disease.

A specific part of the Act covers the use of live animals in research, testing, and teaching. These provisions make it an offence to manipulate live animals for teaching purposes unless this is done in accordance with a code of ethical conduct approved by the Schools' Animal Ethics Committee.

In most cases, activities involving animals in an ECE centre or a school do not need ethical approval. (See [Guidelines for Teachers, Educators, and Students](#) for examples of these activities.)

Ethical approval is legally required only if live animals are to be manipulated for teaching (and other specified) purposes.

The terms "**animal**" and "**manipulation**" are defined in the Animal Welfare Act 1999 as follows.

"Animal"

(a) Means any live member of the animal kingdom that is:

- A mammal
- A bird
- A reptile
- An amphibian
- A fish (bony or cartilaginous)
- Any octopus, squid, crab, lobster, or crayfish (including freshwater crayfish)
- Any other member of the animal kingdom which is declared from time to time by the Governor-General, by Order in Council, to be an animal for the purposes of this Act

(b) Includes any mammalian foetus, or any avian or reptilian pre-hatched young, that is in the last half of its period of gestation or development

(c) Includes any marsupial pouch young; but

(d) Does not include:

- A human being
- Except as provided in paragraph (b) or paragraph (c) of this definition, any animal in the prenatal, pre-hatched, larval, or other such developmental stage.

"Manipulation"

"Manipulation" in relation to an animal, means ... interfering with the normal physiological, behavioural, or anatomical integrity of the animal by deliberately:

(a) Subjecting it to a procedure which is unusual or abnormal when compared with that to which animals of that type would be subjected under normal management or practice and which involves:

1. Exposing the animal to any parasite, micro-organism, drug, chemical, biological product, radiation, electrical stimulation, or environmental condition
2. Enforced activity, restraint, nutrition, or surgical intervention

(b) Depriving it of usual care ...

The term ... does not include:

3. Any therapy or prophylaxis necessary or desirable for the welfare of an animal
4. The killing of an animal by the owner or person in charge (in the course) (as the end point) of research, testing, or teaching if the animal is killed in such a manner that the animal does not suffer unreasonable or unnecessary pain or distress
5. The killing of an animal in order to undertake research, testing, or teaching on the dead animal or on prenatal or developmental tissue of the animal if the animal is killed in such a manner that the animal does not suffer unreasonable or unnecessary pain or distress
6. The hunting or killing of any animal in a wild state by a method that is not an experimental method

Any procedure that the Minister declares ... not to be a manipulation for the purposes of this Act.

The Wildlife Act 1953

Any creature that is in a wild state and is defined as an animal in the Wildlife Act 1953 is absolutely protected unless otherwise stated in the Act. The definition of 'animal' in this Act is quite different from that in the Animal Welfare Act 1999, and it includes some marine species and a number of terrestrial and freshwater invertebrates.

Under the Wildlife Act 1953, it is illegal to keep any species of native animal without a permit from the Department of Conservation.

Changes are made to this Act as new information arises, therefore it is recommended that you go to the [most recent version](#) when referring to it.

Policy on animals for ECE centres and schools

It is recommended that if schools and early childhood education (ECE) centres are keeping animals, they should have an animals policy that has been approved by their board of trustees or ECE centre management. This policy must not contravene the Animal Welfare Act 1999.

A draft policy, which may be adopted as is or adapted by individual ECE centres and schools, is provided as follows.

(Name) ECE centre/school caring for animals policy

_____ ECE centre/school recognises its legal obligations to those species defined as "animals" under the Animal Welfare Act 1999 and its moral responsibilities with regard to other invertebrate animals studied or kept in _____ ECE centre/school.

Goals

- To encourage, through example, the proper care of living things within _____ ECE centre/school situation.
- To provide opportunities for children/students to observe, handle, and care for a range of animals in humane ways.
- To ensure that, in any activity involving the keeping of an animal or its study on a field trip, the welfare of the animal is given high priority.
- To educate children/students by example and discussion about the importance of caring for animals and the responsibilities this involves.
- To work toward [level 1, 2 and 3 Ecology and life processes achievement aims](#), as well as some [level 1, 2 and 3 Investigating in science and Participating and contributing achievement aims](#).

Guidelines

1.	The day-to-day care of all vertebrates, and some invertebrates, in the care of people and/or used in experiments and teaching will be governed by the Animal Welfare Act 1999.
2.	All living creatures at _____ ECE centre/school will be treated with care and respect.
3.	Responsibility for the welfare of animals in _____ ECE centre/school rests with the teacher involved and, ultimately, with the Principal and the Board of Trustees/ECE centre management.
4.	Animals kept at _____ ECE centre/school will be provided with their five basic needs (sometimes expressed as the five freedoms). <ul style="list-style-type: none"> • Freedom from thirst, hunger, and malnutrition (including during weekends and holidays). • Freedom from discomfort and lack of shelter (by being provided with appropriate cages or containers that are properly ventilated and hygienic and do not allow exposure to extremes of noise, draughts, and sunlight). • Freedom from injury, disease, and parasite infestation (by prevention or rapid diagnosis and treatment). Diseased or injured animals will be treated promptly and will not be kept at _____ ECE centre/school until they have recovered. If this is not feasible, they will be humanely destroyed. • Freedom from distress (through proper care and handling). • Freedom to display their normal patterns of behaviour.
5.	If appropriate care and facilities cannot be provided, animals will not be kept at _____ ECE centre/school.
6.	Animals kept at _____ ECE centre/school will be kept in accordance with the conditions, relevant to the particular species, outlined in Section 3 of Caring for Animals, 2012. Species not covered by this section will not be kept/will be kept only if _____ (select the desired option and insert the circumstances or conditions that apply).
7.	In the case of centre/classroom pets, prior arrangements about long-term care (including holiday care) will be made before any animals are kept at _____ ECE centre/school. When the animal is no longer required or is no longer able to be kept, appropriate arrangements will be made to return it to its natural habitat (in the case of a wild animal) or to find a suitable home for it. Non-native classroom pets will not be released into the wild under any circumstances. If appropriate arrangements cannot be made, the animal will be humanely destroyed by a veterinarian.
8.	When animals are used for a specific study, the surviving animals will be returned to their natural habitat or home at the end of the study.
9.	Animals captured on field trips will be returned to their habitat before children/students leave the area unless their proper care in _____ ECE centre/school has been prearranged.
10.	Native animals: <ul style="list-style-type: none"> • will not be kept at _____ ECE centre/school, • will be kept only if _____ (select the desired option and insert the circumstances or conditions that apply). Note that, under the Wildlife Act 1953, it is illegal to keep any species of native animal without a permit from the Department of Conservation.
11.	Where the use of animals in any study (including science fair projects) involves a manipulation in accordance with the law, the study will be carried out in accordance with a code of ethical conduct approved by The Schools Animal Ethics Committee that has been established in accordance with that code. (See Apply for Animal Ethics Approval.)
Signed: _____	
Position: _____	
Date: _____	
Review date: _____	

Guidelines for teachers, educators and students

Can I use animals in my classroom or early childhood education (ECE) centre without ethical approval?

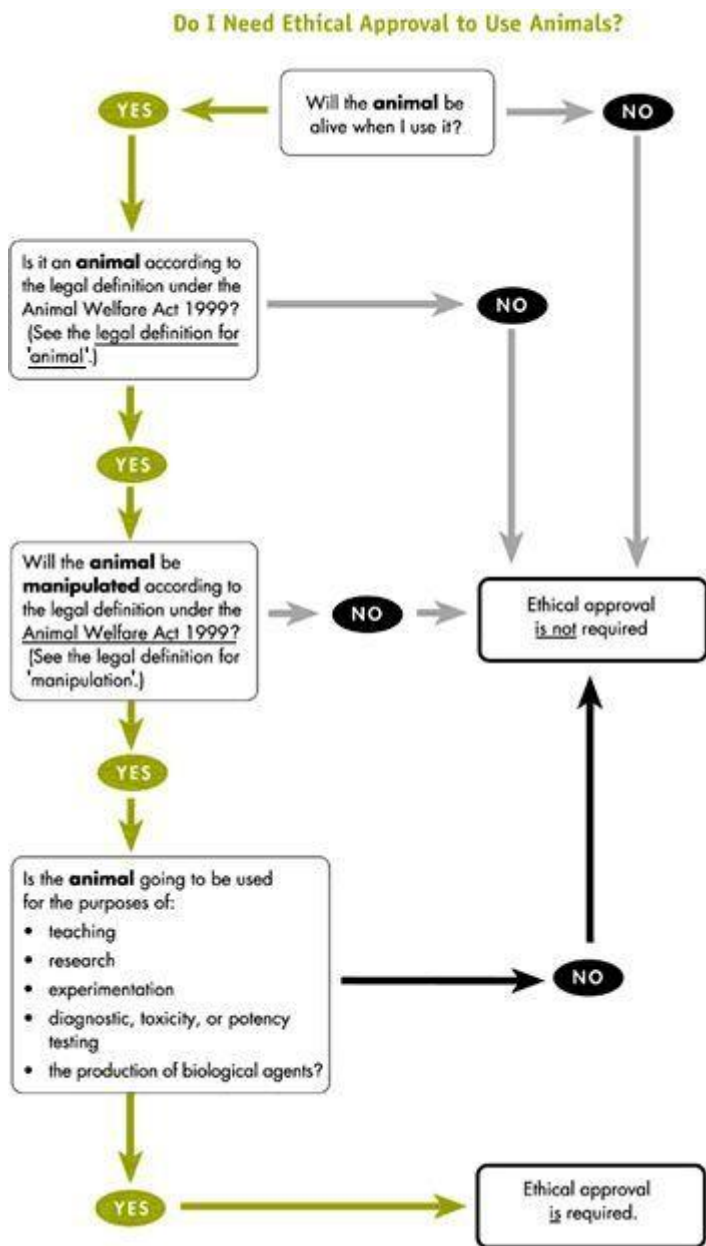
The following occasions usually *do not* require ethical approval:

- **Bringing a pet to the school or ECE centre.** Visits from pets should preferably be planned because, depending on such circumstances as the type of pet and the duration of stay, the animal may need water, shelter, food, and/or a secure place away from children/students where it can be kept when it is not needed during the day.
- **Pet days.** When pets are brought to the school or ECE centre for pet day, teachers, students, and children should:
 - provide them with water
 - ensure that they do not have food withheld in an attempt to make them more obedient during judging
 - provide shelter from the hot sun or from bad weather
 - provide advice that they should be transported to and from the ECE centre/school in secure enclosures, such as cages or pet boxes for small animals and secure, non-slippery trailers or truck decks for lambs and calves
 - remember that some pets will not be used to crowds and may find it stressful to be surrounded by lots of students and children wanting to pat them and high noise levels from people and loudspeakers
 - if they are to be tied up, check that no animals can come to harm. For example, dogs should be kept far enough apart to prevent fights, and livestock should not be tethered near poisonous plants or on steep slopes.
- **Classroom and ECE centre pets.** Keeping an animal in a classroom or ECE centre as a pet and/or for observational purposes does not require ethical approval. However, teachers should:
 - make prior arrangements about long-term care before any animal is obtained
 - provide proper care and facilities (see [Animal Care](#))
 - provide for adequate weekend and holiday care.
- **Classroom and ECE studies involving animals** including such activities as:
 - observing animal behaviour and movement, body structure and function, growth (including regular weighing to chart a growth curve), diet preferences, and food treats
 - preference testing of cage equipment used to enrich the environment of the animal, for example, tubes, platforms, and ramps
 - learning animal care and handling techniques and taking responsibility for the care of an animal
 - using breeding pairs to teach reproduction and development. Before breeding animals, make suitable arrangements for the placement of offspring.
- **Doing dissections and experiments involving non-living animal tissue,** with dissection material obtained from reputable sources. However, note the requirement(s) in *Safety and Science: A Guidance Manual for New Zealand Schools*, for dissection material to be obtained from reputable sources.

The following occasion may require ethical approval, depending on what is involved:

- **Science fair projects in schools.** Although science fair projects might not be undertaken on school premises, teachers should nevertheless ensure that students are informed at the outset of the ethical considerations of using any living creature. Students should also be made aware that special procedures must be followed if an animal manipulation (as legally defined) is planned as part of the project.
- Classroom and ECE studies involving animals other than those listed above.

The following flow chart should help you to decide whether ethical approval is needed.



Flowchart explanation

The flowchart shows you how to decide whether you need ethical approval to use animals. The first question is, "Will the animal be alive when I use it?".

If you answer "Yes" you follow the arrows to the left of the chart. The first question asks you to check whether it is an animal under the legal definition of the Animal Welfare Act 1999. If you answer "Yes" the next question asks if the animal is to be used for teaching, research, experimentation, diagnostic toxicity or potency testing, or the production of biological agents. If the answer is "Yes" then you are informed 'Ethical approval is required'.

If at any stage you answer "No" you follow the arrows to the right and you are informed 'Ethical approval is not required'.

[If I am going to manipulate animals, how do I gain ethical approval?](#)

The New Zealand Association of Science Educators (NZASE) website holds the code of ethical conduct for the use of animals (October 2009). This code is administered by the Schools' Animal Ethics Committee. This Committee ensures early childhood centres, kindergartens, primary schools, secondary schools and students' homes across

New Zealand gain ethical approval, where required, for any research projects involving the manipulation of animals.

For further information on how you can get ethical approval go to the [New Zealand Association of Science Educators \(NZASE\) website](#)

The animals listed in this section are those considered to be most suitable for classroom or early childhood education (ECE) centre care, and they have been carefully selected for that reason.

Keeping such animals as possums, chinchillas, or ferrets should be actively discouraged because they have been declared to be pests. Every opportunity should be taken to develop a sense of responsibility in children and students towards declared pests.

Whether animals being kept in ECE centres and schools are those defined by the Animal Welfare Act 1999 or by the Wildlife Act 1953 or are invertebrate animals, they should all be given the same respect and attention to ensure that their needs are met.

Animal care

The animals listed in this section are those considered to be most suitable for classroom or early childhood education (ECE) centre care, and they have been carefully selected for that reason.

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Whether animals being kept in ECE centres and schools are those defined by the Animal Welfare Act 1999 or by the Wildlife Act 1953 or are invertebrate animals, they should all be given the same respect and attention to ensure that their needs are met.

Axolotls

Housing

The aquarium

- Provide
 - a glass tank (not a round, Perspex bowl) as an aquarium with a water-filtering system to keep the water clean
 - gravel with rocks for the axolotls to stand on
 - plants to provide them with hiding places
 - a cover to protect them from predators and to prevent them escaping.
- Keep aquarium conditions clean and at a relatively constant temperature.
- Axolotls are mainly nocturnal, and they are more active in dim light. They have no eyelids to protect their eyes from harsh lights, so it is important to position the tank out of direct sunlight and to provide them with some shelter, usually in the form of plants.
- Anchor all plants well. Plastic plants are best because they will withstand rough treatment from the axolotls. Plastic is also easy to clean.

Setting up the aquarium

- The minimum size for two axolotls is 60 centimetres × 40 centimetres × 40 centimetres high. If they are overcrowded, axolotls will become less active and may even eat each other.
- Prepare the tank by washing it out with salt and water and rinsing it thoroughly.
- Place the empty tank on a flat, solid surface out of direct sunlight. As 1 litre of water weighs 1 kilogram, when the tank is filled with water and gravel, it may be very heavy. Consider what may happen in the event of an earthquake.
- Before using it, rinse the gravel under a stream of water until the water runs clear.
- Follow the instructions to install the filter.
- Fill the tank to a depth of 25–30 centimetres and secure the plants. Turn on the pump and check that all systems are working.
- Leave the water to stand for one day. This allows the chlorine to evaporate. Alternatively, there are chemical products available to achieve this more quickly.
- Axolotls are poikilothermic, that is, their body temperature is determined by the temperature of the environment. Ensure that they maintain a temperature range of 10–25 degrees Celsius (°C). The optimum temperature is 14–18°C.

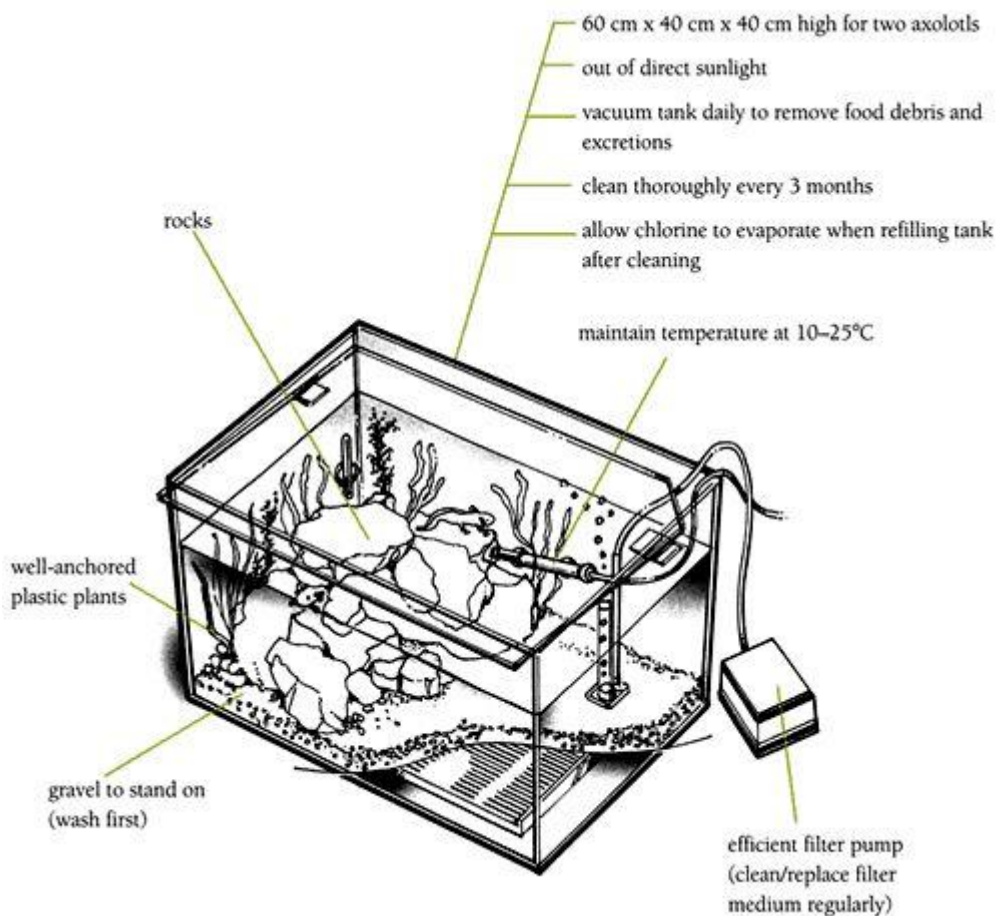
Filtration

- Filtration maintains good water quality by removing waste.
- There are several types of filtration systems, including:
 - under-gravel filters, which draw water and waste down through the gravel but leave large solid wastes behind
 - reverse-flow external filtration systems, which take water from over the gravel, pass it through an external filter, and then return it to the tank.
- The filter medium needs to be cleaned and/or replaced regularly. With either system, vacuum the bottom of the tank to remove large particles of debris.

Maintaining the aquarium

- Remove faecal material each day, usually with a tank vacuum cleaner.
- How often the water needs changing will depend on the number of axolotls and the type of filtration system used. As a rule, remove and replace one-third of the water each week, remembering to let the replacement water stand in a bucket for twenty-four hours to dissipate the chlorine before adding it to the tank.
- With under-gravel filters, rake the gravel through and remove debris before changing the water.
- With an external filtration system, the filter will need cleaning out and the filter medium may need replacing, usually every two to four weeks.
- Plastic plants will develop an algal growth. Most plastic plants can be washed in warm water and left to soak in a weak bleach solution (10–20 millilitres of bleach per litre of water) for ten to fifteen minutes. Rinse them thoroughly before returning them to the tank.
- Depending on the method of water filtration, thoroughly clean the tank at least every three months.

Aquarium diagram



Aquarium diagram

- feed 2–3 times a week
- use blunt forceps
- strips of beef
- multivitamin supplement.

Aquarium diagram explanation

A rectangular tank measuring 60cm x 40 cm x 40 cm high, sufficient for two axolotls. It contains a thermometer to maintain temperature at 10–25°C, rocks, well-anchored plastic plants, washed gravel and an efficient filter pump which must be changed or replaced regularly. It is to be placed out of direct sunlight, vacuumed daily to remove food debris and excrement and cleaned thoroughly every three months. When refilling tank after cleaning chlorine must have time to evaporate. Axolotls should be fed 2–3 times weekly with strips of beef using blunt forceps – a multivitamin supplement is also advised.

How to care for axolotls

Feeding

- Axolotls can be trained to take a variety of foods, such as worms, insects, freshwater shrimps, and tadpoles, or more convenient foods, such as raw beef meat (trimmed of all fat), liver, beef or lamb heart, and cat food. Mince is not suitable food because it contains preservatives. A popular method of feeding is to cut beef schnitzels into strips 0.5 centimetres x 3 centimetres, wrap them in meal-sized portions, and then freeze them until they are needed. However, if the axolotls mainly eat raw beef, give them a multivitamin supplement.

- The amount to feed varies with the axolotl's size, its stage of maturity, and the water temperature. Axolotls need feeding only two or three times a week because they take two to three days, on average, to digest their food. Digestion will be faster at higher temperatures and slower in cold weather. If the temperature falls below 10°C, they will regurgitate their food.
- It is less messy to feed axolotls by hand, holding the food in blunt/round-nosed forceps in front of the animal. Watch carefully because sometimes axolotls eat little during the day. If that is the case, it may be wise to feed them at night, when they become more active, in order to prevent them from eating each other!

Handling

- Handle axolotls only when it is necessary, such as when cleaning the tank. They can be trapped with a shallow net and then gently grasped with one hand around their neck and shoulders and the other around their abdomen and hind legs. Do not squeeze them because they are easily damaged. When handling them, take care as they often thrash their tails around, which could damage them.
- Handle the animals only with clean, wet hands that have no trace of soap or detergent on them. Take any rings off before handling them and always wash your hands afterwards.

Health

- Learn what is normal behaviour for axolotls and check them daily. Remember that because axolotls breathe through their skin, it must not dry out.
- Incorrect environmental conditions and inadequate nutrition can make axolotls sick. To avoid this, feed them a variety of foods and maintain good-quality water.
- Axolotls can also be affected by viruses and bacteria. At any sign of illness, or if you have questions, consult a veterinarian.
- Beware of ammonia build-up, which is toxic. Ammonia is the main metabolic waste product of axolotls, and it also comes from decomposing food and other organic material. Increased levels of ammonia can also be caused by overcrowding, overfeeding, high water pH, warm water, and new tanks that haven't had time to develop good populations of nitrifying bacteria. Having a good water flow, changing water regularly, and removing uneaten food and faecal material can control ammonia levels.

Birds

Housing

The aviary

- Provide an indoor perching and sleeping area and enough room for outdoor flight. This may include plants or such trees as willow, birch, or eucalyptus. Select these with care because many garden plants are poisonous.
- The dimensions will vary with the sizes and numbers of birds to be housed, but a flight area should be long and narrow rather than square-shaped.
- For safety reasons, the aviary should have double doors.
- If you plan to build an aviary outdoors, you may need to obtain a building permit from the local authority.
- Mixing different species of birds, such as finches, budgerigars, and lovebirds, is not recommended because the birds may fight.

The cage

- Cages are more practical in a classroom or ECE setting than an aviary is. A cage should be large enough for the bird to be able to extend its wings without touching the sides of the cage and to perch without its tail touching the floor. The average-sized cage for budgerigars and finches is 60 centimetres × 60 centimetres × 50 centimetres high.
- Birds feel more secure if their cage has mesh bars on only one side and the other three sides are solid. This also reduces draughts. However, many ready-made cages are open on all sides. One way to fix this is to put the cage in a corner or to provide a small cardboard or wooden box inside the cage for the bird to hide in. Cage covers are useful for open cages to provide security and to protect birds from draughts.
- The cage and its contents should be easy to clean and made out of non-toxic material. Psittacine birds, such as parrots and budgerigars, will chew wooden cages. Line the cage with paper towels, other plain paper, or newsprint but take care with newspaper because some birds may chew it.
- As most birds normally spend their time flying or perching in trees above human height, the cage should be placed well above ground level at human head height or higher.

Cleaning

- Replace the cage lining daily.
- Wipe out the cage and wash food and water holders weekly.

Perches

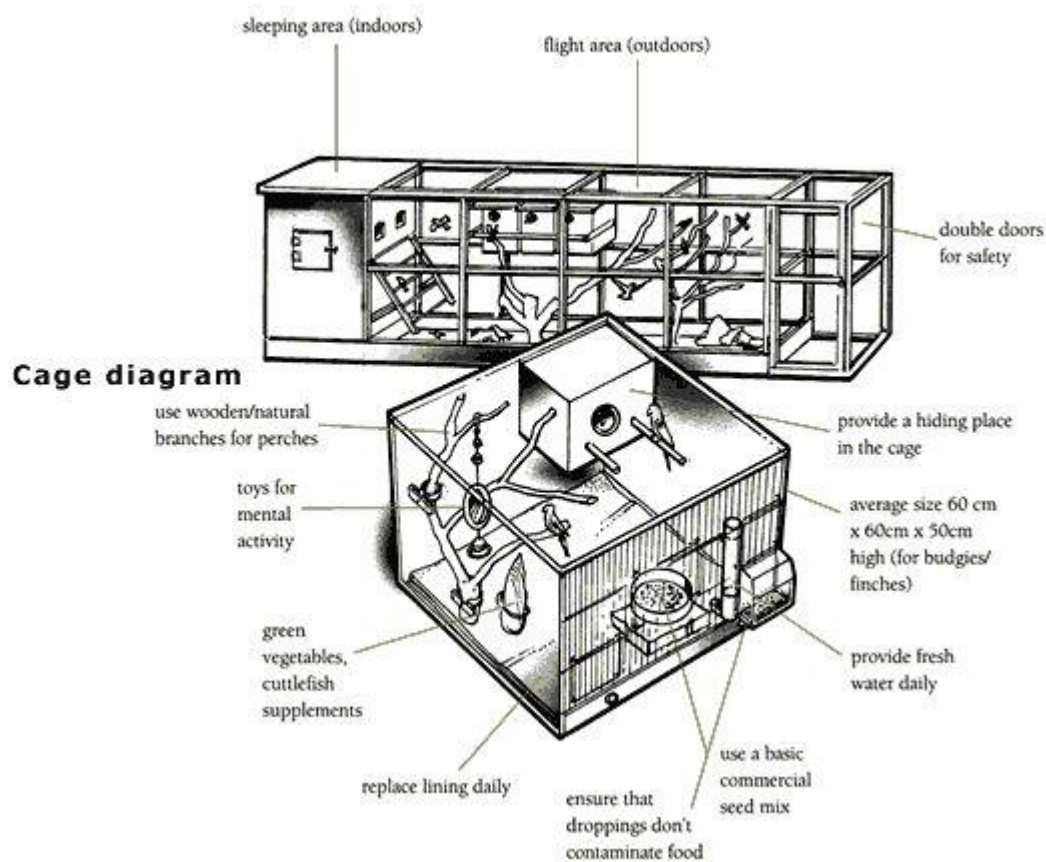
- The perch should be a clean, comfortable place for the bird to stand on. Providing a perch of differing diameters helps to exercise the bird's feet.
- Plastic and wooden dowels are easy to keep clean, but they are not as good as replaceable natural branches. Remember that many garden plants are poisonous. Apple tree branches are suitable.
- Do not use sandpaper-covered perches because they can be abrasive and make the bird's feet prone to infection.
- Place perches so that droppings do not contaminate food and water and so that the bird's tail does not touch the floor or food containers when it is sitting on the perch.

- Finches need two perches, one at each end of the cage. As most budgerigars are agile climbers, a single well-placed perch may be adequate.

Toys

- Birds of the parrot family are active and intelligent. Toys provide them with mental activity and relief from boredom as well as encouraging exercise and beak activities. Lone budgerigars may form a bond with a toy and try to feed it.
- Toys should be safe. The ideal toys are hanging chains, bells, keys, swings, and mirrors. Other safe items that promote natural beak activities are pine cones, clothes pegs, and egg cartons.
- Limit the number of toys in the cage at any one time. Keep them clean and rotate them to maintain the bird's interest. Replace toys that are infrequently used.

Aviary diagram



- don't mix bird species
- provide company
- mist/bathe 3–4 times a week.

Aviary and cage diagrams explanation

Two houses for bird cages: one outdoor aviary and one indoor cage. It is advised to provide company for birds but not to mix species. Mist or bathe 3–4 times weekly.

The outdoor aviary is a rectangular structure and no measurements are given. It has a covered sleeping area at one end that occupies a quarter of the total space and has two small entry holes with a ladder leading to them. There is a hatch in the ceiling to allow the birds to fly outdoors and double doors at the far end for safety. Inside there is a small branch for perching, rocks on the ground and three feeding boxes suspended from the roof.

The cage is square and measures 60cm x 60 x 50cm which is an average size for budgies or finches. Inside the cage there are wooden/natural branches for perches, toys for mental activity and green vegetable and cuttlefish

supplements attached with wire to the cage bars. In the top right corner there is a small box with an entry hole to provide a hiding place in the cage. Outside the cage are two small feeding trays and a water tube that the bird/s can access from the inside. A basic commercial seed mix is to be used in the feeding trays, the water changed daily, and care taken that droppings do not contaminate the food. Cage linings should be changed daily.

How to care for birds

Feeding

- Different bird species have different nutritional requirements. Budgerigars extract the kernels of seeds or nuts by cracking the hard outer husk with their beaks. Finches and canaries eat seeds, but they can't crack nuts. The size of the seed should suit the size of the bird. Commercial seed mixes can provide a basic balanced diet. Remove empty seed husks from the seed container every day.
- Well-washed green vegetables, such as spinach, lettuce, and chickweed, and fruits may supplement the diet. Never feed avocado because it is poisonous to birds.
- Cuttlefish bone and oyster-shell grit provide minerals that are essential for crop function.
- Keep food containers off the floor to reduce the risk of faecal contamination.
- Column water containers are preferable because birds are unable to bathe in them and it is easy to check the water level. Give birds fresh water daily.

Handling

- Restrain a small bird in one hand by gently placing your thumb and first finger on either side of its head and immobilising its wings with your remaining fingers. Be careful not to squeeze the bird's chest.
- Finches are common cage birds, but they are not suited to regular handling because they may go into shock and die.
- Budgerigars may be accustomed to handling. However, they may hurt themselves if they panic and will bite if they are hurt or frightened.
- Exercising a bird in the classroom is not recommended.

Health

- Always feed birds their appropriate diet and keep their cage clean.
- Each day, look for normal activity. Is your bird eating, preening, and grooming its feathers? Check its skin for scabs, dandruff, bald spots, or itchiness. Check that its eyes, ears, and nares (nostrils) are clear of any discharges and that its droppings are normal. Check its beak, nails, and feet. Know what is usual for birds.
- Moulting (the normal loss and replacement of feathers) is influenced by the time of year, the age of the bird, and the degree of stress it is under.
- To keep their feathers healthy, budgerigars (budgies), parakeets, canaries, and finches need a mist or water bath three to four times a week. Another option is to provide them with a bunch of wet chickweed.
- Birds like regular routines, and they may take time to adapt to any change, whether it is a new environment, a new food, or a new toy. When changing a bird's environment, provide a quiet time to allow it to settle. Covering the cage provides extra security for the bird.
- Birds can be affected by viral, bacterial, and parasitic conditions. Finches and budgerigars are active, alert birds. They should sit upright on the perch. Sick birds often seem weak and have a drooping, fluffed-up appearance. If you ignore their illness, small birds may rapidly deteriorate in condition. At any sign of illness, or if you have questions, consult a veterinarian.

Interesting facts about birds

- Budgerigars weigh about 30–85 grams. They have two to six eggs and incubate them for twenty-one to thirty days.
- Finches (canaries and zebra finches) weigh about 10–20 grams. They have four to six eggs and incubate them for ten to fourteen days.
- Birds have social needs. They like the company of other birds and the attention of people.

Field crickets

Housing

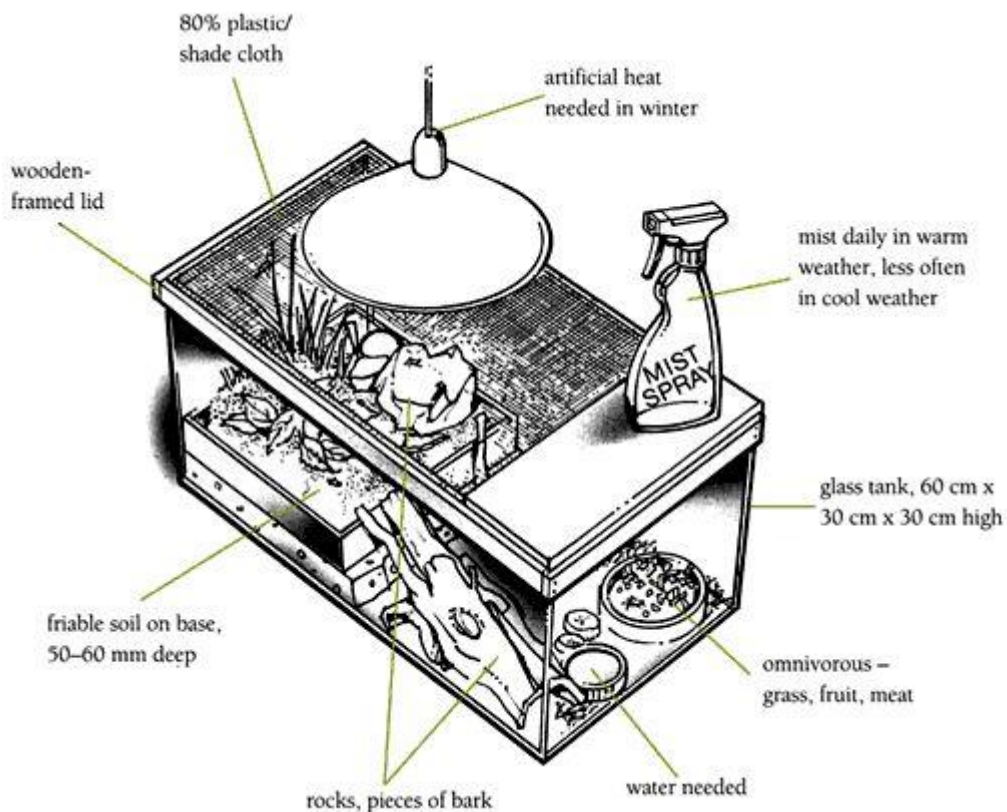
The tank

- Crickets need a glass tank 60 centimetres × 30 centimetres × 30 centimetres high with a wooden-framed lid, 80 percent of which is covered with plastic or steel insect mesh or shade cloth for ventilation.
- On the base, provide friable soil 50–60 millimetres deep, mounded to assist drainage and with leaf litter on top. This can be set up in seed trays on pieces of paving stone or bricks to provide better drainage. Ensure that the trays fit hard against the walls of the tank so that the crickets don't get underneath.
- Provide a few rocks so that the crickets can climb off the soil and some places for them to hide. Pieces of bark in layers make ideal hiding places. These should be about 20 centimetres × 15 centimetres.

Environment

- Field crickets need a warm environment. They can be kept at 20–30°C with an average temperature of 26°C. You can achieve this easily in the summer, but you will need artificial heat if the insects are to be kept during the winter. Position a 60- to 100-watt light bulb above the cage to provide the desired temperature. Test the position of the bulb before introducing it to the insects.
- Crickets need a humidity level of 40 to 60 percent. You can maintain this by misting the enclosure once a day in warm dry weather and once every four days in cool damp weather.
- More frequent misting is likely to be needed if artificial heat is used, but take care to ensure that the humidity level does not rise above 60 percent.
- Ventilation is very important. The cage should be in a well-ventilated part of the classroom, preferably away from the windows because the sun can raise the temperature to intolerable levels.

Tank diagram



temperature range 20–30°C

- ventilation is important.

Tank diagram explanation

A rectangular glass tank 60cm x 30cm x 60cm high is shown. It has a wooden framed lid and eighty percent of the lid is shade cloth or plastic – ventilation is important. There is a light above the tank to show artificial heat is needed in winter. A mist spray bottle on the tank shows the tank needs a daily mist in warm weather and less in cooler weather. Half the inside of the tank is a raised box with friable soil about 50–60mm deep on the base. In the box are rocks and twigs and a piece of wood provides a bridge from the cage floor to the box. There is a small circular water lid for water on the ground and a larger one for food. Crickets are omnivorous so grass, fruit, and meat need to be provided. Temperature range for crickets is 20–30°C.

How to care for field crickets

Feeding

- The field cricket is an omnivore. Its staple diet in captivity should include grass, fruit, such as apples, bananas, and stone fruit in 20-millimetre-sized pieces, and a selection of animal protein items, such as fish food, pet sausage, or cat biscuits soaked in water in an upturned lid.
- You can provide grass by planting clumps in the soil and replacing it as it is eaten or as it deteriorates.
- Provide drinking water in a separate lid or place a soaked wad of cotton wool in a lid.

Breeding

- If conditions are good, the crickets may breed. After mating, the female places the eggs into the soil using her ovipositor.
- Eggs are usually laid in autumn and will develop into nymphs (junior adults) when the weather warms up in spring.
- Young crickets are very active. They will grow and mature in the presence of other individuals only if ample space, shelter, and food are provided.

Goldfish

Housing

The aquarium

- As a general rule for estimating the size of the tank needed, allow 4.5 litres of water for every 1 centimetre length of fish (including the tail). A good starting size is 60 centimetres × 45 centimetres × 40 centimetres high.
- The tank should have enough water surface for oxygen to be absorbed efficiently from the air, and it should have a deep front for viewing. Its carrying capacity is influenced by the size of the fish, the size and amount of tank furniture and hiding places for fish, feeding regimes, whether the tank is filtered and aerated, the water temperature, and waste metabolites present in the water. Furniture, plants, filtration, and aeration all increase the carrying capacity.
- A cover is essential to protect the aquarium from dust, pollutants, and predators. It will also help to maintain an even water temperature.
- The tank should also have an aeration pump, an under-gravel filter, river gravel, and plants. Plastic plants are easier to care for than live plants.

Setting up the aquarium

- Prepare the aquarium one or two days before placing the fish into it so that the chlorine in the water will evaporate. Alternatively, use chemical products that achieve this more quickly.
- Prepare the tank by washing it out with salt and water and rinsing it thoroughly.
- Place the empty tank on a flat, solid surface out of direct sunlight. As 1 litre of water weighs 1 kilogram, when the tank is filled with water and gravel, it may be very heavy. Consider what could happen in the event of an earthquake.
- Gravel is to a tank what soil is to a garden, and so there should be a generous depth of about 5–10 centimetres. Before placing gravel in the aquarium, rinse it under a stream of water until the water runs clear. Fill the tank about one-third full with water and follow instructions for the installation of an under-gravel filter.
- Plants not only provide hiding places for the fish, they also make the tank look nice. Real plants assist the biological filter in reducing ammonia levels, and they appear to reduce algal growth, although most of this is an aesthetic problem only.
- Plants provide small amounts of natural food. Sometimes goldfish will eat them faster than the plants can grow. When placing the plants, put the tallest at the back and the shortest in the front.
- Continue to fill the tank to within 5 centimetres of the top and turn on the pump to check that all systems are working.
- Do not release the fish straight into the tank because the sudden temperature change may kill them. If the fish are in a plastic bag, put the unopened bag into the tank water for about an hour to adjust the water temperature before releasing them.

Respiratory gas exchange

- Fish need oxygen to breathe. They breathe through their gills and extract oxygen that is dissolved in the water. Oxygen diffuses readily into water, but the water temperature will affect the amount that can be dissolved. Cold water holds more oxygen than warm water.
- Sources of oxygen in the aquarium include diffusion at the surface of the water and an aeration system. Do not rely on plants alone to provide oxygen because, although they photosynthesise during the day, they use

up oxygen at night. Fish, plants and phytoplankton (at night), decaying organic matter, and bacteria all use up oxygen.

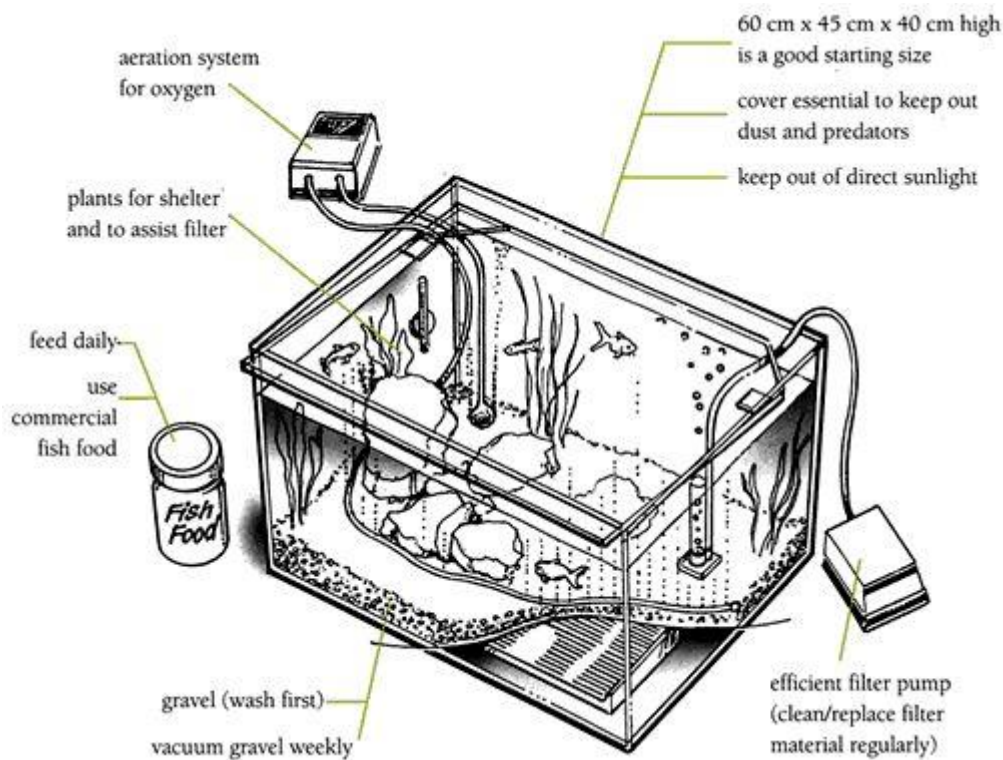
Maintaining the aquarium

- How often the water needs changing depends on the number of fish and the effectiveness of the filtration and aeration systems. As a rule, remove and replace one-third of the water every two weeks. Remember to let replacement water stand in a bucket for twenty-four hours to dissipate the chlorine before adding it to the aquarium.
- Plastic plants will develop an algal growth. Wash them in warm water and leave them to soak in a weak bleach solution (10–20 millilitres of bleach per litre water) for ten to fifteen minutes. Rinse them thoroughly before returning them to the tank.

Filtration

- Filtering the water removes waste products and helps to maintain good water quality and good fish health. There are two main kinds of filtration – mechanical and biological. Chemical filtration is rarely used.
- Mechanical filtration removes material suspended in the water by pumping it through a filter material, such as glass wool. Clean this filter every one to two weeks, depending on the size of the tank and the number of fish it contains. Even when the water looks clean and clear, it can still contain dissolved wastes that may affect the fish.
- Biological filtration basically relies on the work of beneficial nitrifying bacteria that colonise the surface of the gravel and rocks in the aquarium. Under-gravel filters allow the whole gravel bed to become colonised. As the gravel may act as a mechanical filter as well, siphon off debris sitting on the surface of the gravel once a week. One-third of the gravel should be removed every eight to twelve months and rinsed lightly in water to remove accumulated debris. Don't wash all the gravel at once because you may lose the 'good' nitrifying bacteria.

Aquarium diagram



- remove and replace one-third water every two weeks
- allow chlorine to evaporate when refilling tank after cleaning.

Aquarium diagram explanation

The glass tank 60cm x 45cm x 40cm high shown is a good starting size. It must have a cover to keep out predators and be kept out of direct sunlight. A small square aeration system is shown outside the tank with two tubes leading into the tank – ventilation is important. A small filter pump is shown leading into the tank to a tube that needs regular filter changes. Inside the tank there is washed gravel on the tank floor and rocks and plants to provide shelter and assist filtration. Every two weeks one third of the water should be removed and replaced. When refilling the tank after cleaning the chlorine needs time to evaporate. There is a jar of fish food outside the tank to show the fish need daily feeding with commercial fish food.

How to care for goldfish

Feeding

- Feed the fish once a day, using commercially available goldfish flakes or granules.
- Feed only amounts that can be eaten within a few minutes because uneaten food decomposes on the bottom, increasing the ammonia levels in the tank.
- Remember to make arrangements for feeding outside school and ECE centre hours and during weekends and holidays.

Health

- Learn what is normal behaviour for fish and check them daily.
- Fish can and do get sick, often because of their environmental conditions. Consult a veterinarian about this.
- Beware of ammonia build-up, which is toxic to fish. Ammonia is the main metabolic waste product of fish, and it also comes from decomposing food and other organic material. Increased levels of ammonia can also be caused by overcrowding, overfeeding, high water pH, warm water, and new tanks that haven't had time

to develop good populations of nitrifying bacteria. Ammonia levels can be controlled with a good water flow, regular water changes, and not overfeeding the fish.

Interesting facts about goldfish

- Goldfish (cyprinids) are cold-water, herbivorous fish. They are poikilothermic (cold-blooded), and so their body temperature is determined by their environment.
- Goldfish are egg layers and provide no parental care. They usually deposit their eggs on vegetation or near the surface of the water.

Guinea pigs

Housing

The hutch

- The minimum size for a hutch for two guinea pigs is 100 centimetres × 50 centimetres × 40 centimetres high.
- One-third of the hutch should be enclosed to provide a warm, draught-free sleeping area. The remaining two-thirds should be a light and airy run, covered in strong mesh. The floor should be impervious to urine and moisture.
- As you will need access to both the sleeping quarters and the run, especially for cleaning, many hutches have a hinged roof for this purpose. Catches on these should be strong and secure enough to prevent dogs from breaking in.
- Guinea pigs prefer a temperature range of 18–23°C with a light cycle of twelve hours light and twelve hours dark. They prefer subdued lighting.

The outdoor hutch

- The dimensions for an outdoor hutch are the same as for an indoor hutch, but an outdoor hutch should also have a sloping, waterproof roof that overhangs the sides. The cladding of the sleeping quarters should also be waterproof.
- To protect guinea pigs from predators (dogs and cats), the hutch should be strongly constructed using welded mesh and/or be elevated on stilts.
- The door to the sleeping quarters should be protected from the wind and rain so that both the guinea pig and its bedding stay warm and dry.
- Guinea pigs are susceptible to cold temperatures and to changes in temperature. During winter, they should be housed indoors for warmth.

Sleep and play

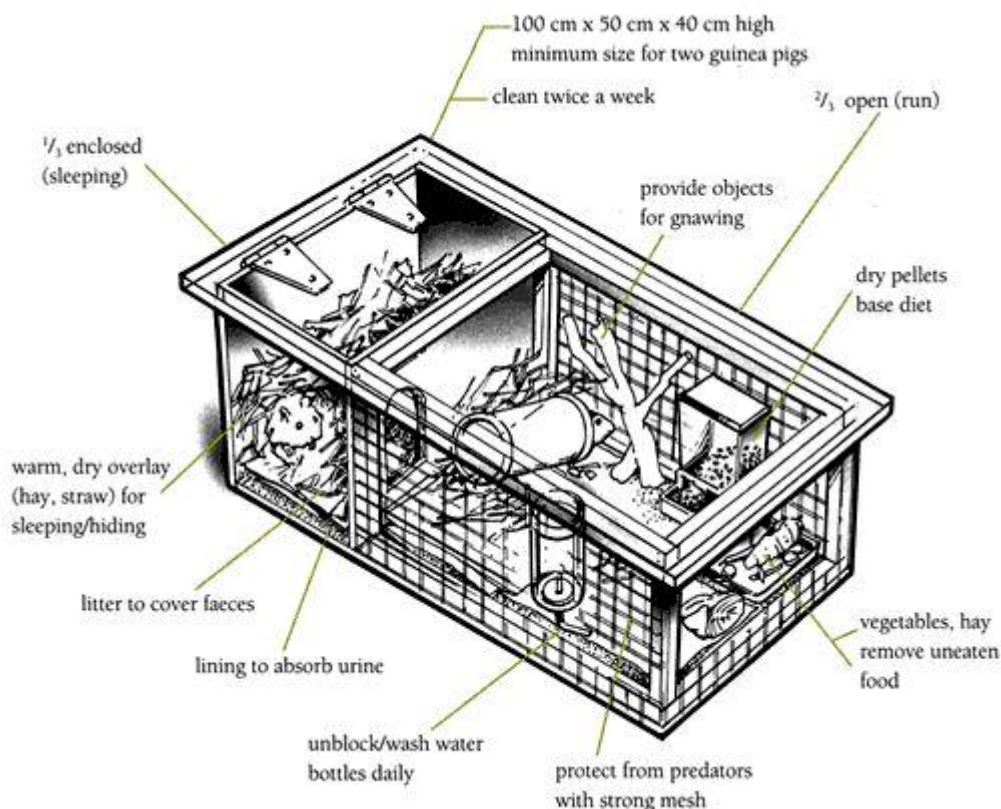
- There are two components of bedding – lining and litter material and overlay materials.
- Lining material, such as newspaper or plain newsprint, absorbs urine and spilt water. Litter material absorbs urine and other moisture and also covers faeces. Use untreated sawdust or kitty litter.
- Overlay materials are used mainly in the sleeping quarters, and they include shredded paper, straw, and good-quality hay.
- Use lining materials in the sleeping quarters and add a generous amount of overlay.
- In the run area, use lining material, litter, and some overlay, depending on the space available.
- The run should be large enough for guinea pigs to run around and should include hiding places, such as pipes and logs. Like all rodents, guinea pigs need visual security. In the wild, they spend the day sheltering in burrows and feed at nightfall. They enjoy having straw and hay to burrow in and to chew on.

Cleaning

- Good hygiene reduces unpleasant smells and the risk of disease. Cleaning materials include rubber gloves, a scrubbing brush, a cloth, dishwashing detergent, and water.

- The sleeping quarters and run should be cleaned twice a week. If cages are left dirty, irritants such as ammonia, moisture, and bacteria may rise to harmful levels, causing illness.
- Disinfect the furniture in the run twice a month with a weak bleach solution (10–20 millilitres per litre of water). Leave it to stand for a minimum of fifteen minutes and then rinse it well and dry it.
- Each month, wipe all the hutch surfaces with a bleach solution. Rinse them well and dry them.
- Every day, wash the water bottles and tubes with detergent and water. Rinse them well. Once a week, disinfect the bottles and tubes with the bleach solution, soaking them for at least fifteen minutes. Rinse them well and dry them.

Hutch diagram



optimum temperature range 18–23°C

- bring indoors during winter at night
- subdued lighting preferred.

Hutch diagram explanation

The wooden hutch 100cm X 50cm X 40cm high shown is the minimum size for two guinea pigs. One third of the hutch is for sleeping quarters and has warm, dry overlay (hay or straw) for sleeping or hiding. Above the sleeping third of the hutch is a hinged lid. The remaining two thirds of the cage is an open run with strong wire mesh to protect the guinea pigs from predators. Inside the hutch there are objects for gnawing, lining to absorb urine, and litter to cover faeces.

There is a feeding dish for vegetables or hay – uneaten food should be removed. There is small feeding trough attached to the side bars containing dry pellets – the guinea pigs base diet. Also attached to the sidebars on the

opposite side of the cage is a water tube that should be washed daily. The hutch should be brought indoors in winter and subdued lighting is preferred. Optimum temperature for guinea pigs is 18–23°C.

How to care for guinea pigs

Feeding

- Guinea pigs are messy. They kick their food and bedding around their cages and urinate and defecate in open water and food containers. Food (dry pellets) and water are best supplied in hoppers and bottles that are attached to the sides of the run. Water bottles should have bungs that cannot be chewed.
- Regularly check that the sipper tube of the water bottle is unblocked because guinea pigs often spit food up the tubes, stopping the flow of water. An 800-gram guinea pig will drink 80–320 millilitres of water a day.
- Each day, remove and replace uneaten fresh food.
- Guinea pigs are herbivores and, like people, cannot make their own vitamin C (ascorbic acid). Dry pelleted food, formulated for guinea pigs and available from pet shops and some veterinarians, is a good base diet that should be supplemented with fresh, well-washed raw fruit and vegetables. Carrots, beans, celery, carrot tops, silverbeet, and cabbage are good for keeping their teeth in shape and supplying vitamin C.
- A supply of quality hay is a necessary source of dietary fibre.
- Store dry food in an airtight container in a cool dry place. Avoid sudden changes in diet and do not buy more than three months' supply of food at once to maintain its nutritional value.
- If you don't give guinea pigs something to gnaw on, they will chew their hutch. Fruit tree branches are good, but select plants carefully because many garden plants are poisonous.

Handling

- Guinea pigs enjoy gentle handling and petting, and it is normal for them to vocalise while being handled. Daily handling helps to keep them tame and provides an opportunity to check on their health. However, if they are over-handled, they can easily become stressed.
- To hold a docile guinea pig, use one hand to support its chest with your thumb and forefinger in its armpits or around its shoulders and your second hand to support its hindquarters. A guinea pig that falls or is dropped may be seriously injured.
- Guinea pigs rarely bite, but they may scratch.
- Wash your hands after handling guinea pigs.

Health

- During your daily health check, look for normal activity. Is your guinea pig eating and grooming? Check its fur and skin for scabs, scurf, bald spots, or itchiness. Check its eyes, ears, and nose for any discharges and check that its faeces and urine are normal. Know what is usual for your guinea pig. Cleanliness is vital.
- Lice, ringworm, and vitamin C deficiency can cause skin problems in guinea pigs.
- Dentition problems can be caused by overgrown teeth or by the guinea pig not having enough hard food to eat or a gnawing block to chew on.
- Gastrointestinal problems, such as diarrhoea, can be caused by eating contaminated food or by sudden dietary changes.
- Stress may also cause guinea pigs to become ill, and they may deteriorate rapidly if their illness is ignored. At any sign of illness or if you have questions, consult a veterinarian.

Interesting facts about guinea pigs

- Guinea pigs are small, nocturnal, grazing rodents from the Andes mountains in South America. In their natural habitat, they live in social family groups. Because they are social, it is best to keep two to three animals of the same gender.
- There are many different breeds with fur of different lengths. Long-coated varieties need regular grooming.
- Guinea pigs have open-rooted teeth that continue to grow, and so they need constant wear to maintain good dentition.
- Female guinea pigs weigh 700–900 grams, and males weigh 900–1200 grams.
- A guinea pig's lifespan is three to six years.
- Although females (sows) may breed at under twelve weeks of age, it is best to wait until they are at least four to six months old. Males (boars) reach puberty at three to four months old.
- Gestation is sixty-three to sixty-eight days. The babies are born fully developed, with fur and teeth and with their eyes and ears open. The average litter size is three to four, and sows may mate and conceive again within six to eight hours of giving birth.

Mice

Housing

The cage

- Housing materials should be easy to clean, resistant to chewing and gnawing, and impervious to liquids so that they do not absorb urine and faeces. Commonly used materials include hard plastic, stainless steel, and glass. Check that the lid fits firmly.
- Purpose-built cages of hard plastic are available from pet shops at reasonable prices. They usually provide a nesting/sleeping box and living quarters. Some provide for additional space if it is needed.
- Wooden cages are not recommended because mice may gnaw them, they are difficult to sanitise, and they may absorb urine, which leads to unpleasant odours.
- Mesh floors are not recommended because the mesh can cause foot injuries.
- Ensure that the cage is big enough to accommodate both the mice and their furniture comfortably. A minimum size for two to three mice is 60 centimetres × 30 centimetres × 25 centimetres high.
- Provide a sleeping box and good hiding places in the living area. For example, cardboard tubes provide good tunnels and are easily replaced, and opaque non-toxic jars can be cleaned easily.
- Food containers should be gnawproof. Overhead-rack types are best because they reduce wastage and do not get contaminated by faeces. Containers that attach to the cage's sides are also acceptable because they reduce spillage.
- Heavy-duty pottery containers may also be used, but as they can be more easily contaminated with urine and faeces, change the food in them daily.
- Open water dishes are not recommended because of possible contamination by faeces, which leads to disease. The water in them can also be easily spilled, leading to dehydration in the mice and an increase in moisture in the cage. Sipper tubes and bottles attached to the sides of the cage work well.
- Provide objects for gnawing, such as a small bark-covered log from an apple tree. Select logs carefully because many garden trees are poisonous.
- Mice need stimulation, so include exercise toys, such as exercise wheels, ladders, plastic tubes, and different-shaped boxes.
- Do not house male mice together because they may fight and severely hurt or even kill each other.

Bedding

- Line the cage with untreated wood sawdust or shavings 2–3 centimetres deep, kitty litter, or shredded plain paper but not newspaper because printing ink may be harmful to the mice.
- The sleeping box should contain shredded plain paper, such as paper towels or tissues, or cotton wool (although this is not suitable for breeding because it may entangle the limbs of newborn mice).

Cleaning

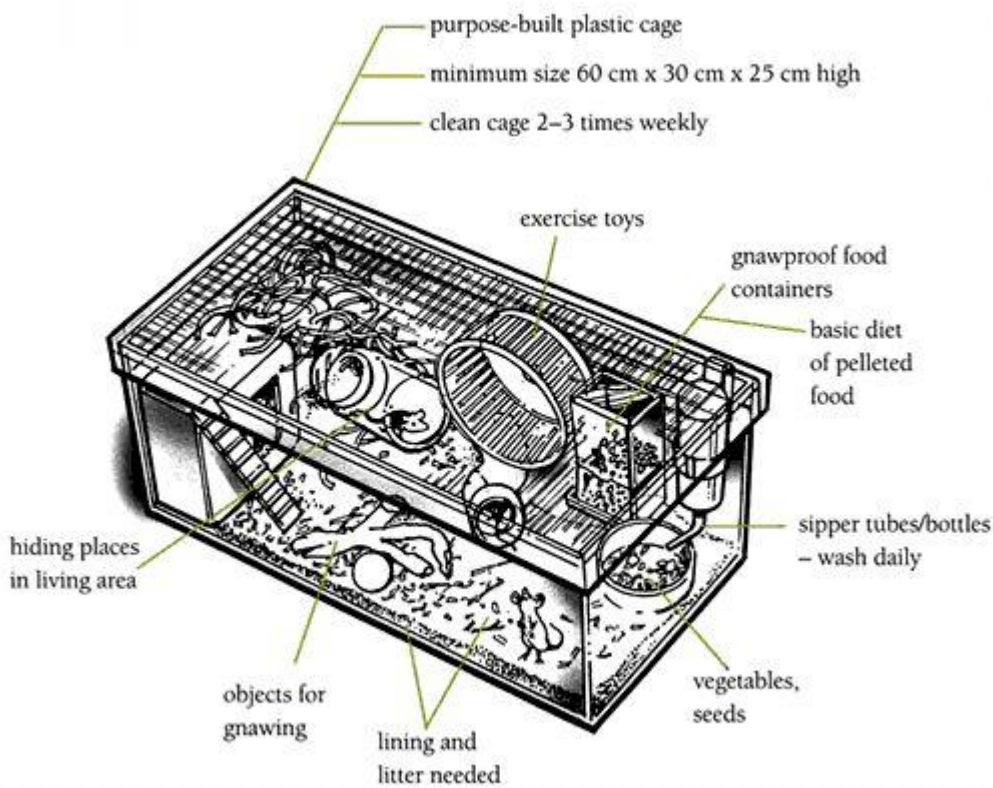
- Clean the cage two to three times a week using rubber gloves, a scrubbing brush, dishwashing detergent, and water. Rinse it well and dry it.
- If cages are not kept clean, such irritants as ammonia, moisture, and bacteria can rise to harmful levels, predisposing the mice to illness. Good hygiene practices reduce both the risk of disease and the smell.

- Disinfect cages and furniture twice a month with a weak bleach solution (10–20 millilitres of bleach per litre of water), leaving them to stand for at least fifteen minutes in the solution.
- Clean water bottles and tubes daily with detergent and water and disinfect them weekly with the bleach solution. Soak them for at least fifteen minutes and rinse them well.
- It is difficult to eliminate the musky smell of mice, but strict cleanliness can help to minimise odours. Some people consider females to be less smelly than males.

Environmental factors

- The optimum temperature range for mice is 18–29°C. Keep their cage out of direct sunlight.
- Mice prefer a light cycle of twelve hours of light and twelve hours of dark, with low light intensity.

Cage diagram



- optimum temperature range 18-29°C
- not in direct sunlight

Cage diagram explanation

A rectangular purpose-built plastic cage of 60cm x 30cm x 25cm high is shown. It is clear plastic with a well-fitting lid. The cage should not be in direct sunlight and cleaned 2–3 times weekly. At one end of the cage there is a small hiding or sleeping place. Inside the cage there are objects for gnawing, exercise toys like a rotating wheel and gnawproof, feeding containers for pelleted food. There is also a container containing vegetables or seeds. Sipper tubes or bottles are attached to the side of the cage and these should be washed daily. Optimum temperature for the mice is 18–29°C.

How to care for mice

Feeding

- Mice do well on pelleted food as their staple diet. It is also good for their teeth.
- Give them seeds and some raw vegetables, such as carrots, swedes, and apples, as treats. However, if the mice are not used to these foods, they may develop a mild diarrhoea that doesn't usually last long.
- Store their dry food in an airtight container in a cool, dry place. Buy only three months' supply at a time to ensure good nutritional value.
- Change their drinking water daily.

Handling

- You can lift a mouse by grasping the base of its tail and, at the same time, supporting its body with your hand.
- Daily handling helps to keep mice tame and provides an opportunity to check on their health. Handle mice gently. If they are frightened or hurt, they may bite.
- Always supervise children and students when they are handling mice.
- Wash your hands after handling mice.

Health

- Do a health check each day. Look for normal activity – are the mice eating and grooming themselves? Check that their fur looks normal and that they have no scabs or bald spots. Check that their eyes, ears, and noses are clear of any discharges and their faeces are normal. Know what is usual for your mice.
- Changes in temperature and an increase in the level of ammonia because of poor hygiene in the cage may cause mice to develop respiratory diseases.
- Gastrointestinal problems can be caused by unclean food containers, contaminated food, or eating unfamiliar foods.
- Mice may be affected by viral, bacterial, and parasitic conditions. If you find any signs of illness, or if you have questions, consult a veterinarian.

Interesting facts about mice

- Mice are rodents. They are social animals, so it is good practice to keep two or three together, preferably all female.
- Mice come in many colours.
- They have open-rooted teeth, and so constant wear is necessary to maintain good dentition.
- Mice live from one to three and a half years.
- The doe (female mouse) may breed from six weeks of age, and gestation is nineteen to twenty-one days.
- As baby mice are furless and helpless when they are born, it is important not to disturb the nest at this time. The babies' eyes open at ten to fourteen days, and they are weaned when they are nineteen to twenty-one days old.

- Males reach puberty at five to six weeks of age.
- Females may mate immediately after the birth of a litter, and so one litter is weaned as the next litter is born.
- You can determine the sex of the young at four to five weeks of age and segregate the males from the females.

Rabbits

Housing

The hutch

- Rabbits need a roomy hutch. Typical dimensions for a small-to-medium-sized rabbit are 150 centimetres × 60 centimetres × 60 centimetres high.
- One-third of the hutch should be enclosed to provide warm, draught-free sleeping quarters. The remaining two-thirds should be a run covered with strong mesh allowing light and ventilation.
- Hutches should be large enough to allow free movement, be easy to clean, and have no rough edges. As both wire and solid flooring may give rabbits sore hocks, use washable plastic floors or lay wood shavings or hay over a solid floor.
- Rabbits may be housed indoors or outdoors. Their ideal temperature range is 18–28°C. If temperatures rise above 27–30°C, they are susceptible to heatstroke.
- Access to both the sleeping quarters and the run is needed, especially for cleaning, and many hutches have a hinged roof for this purpose. Catches on these should be strong and secure. Consider security needs both during and outside the hours for an ECE centre and a school.

Outdoor hutches

- An outdoor hutch should have a sloping, waterproof roof that overhangs the sides. The cladding of the sleeping quarters should also be waterproof.
- Outdoor housing should give protection from direct sunlight. In temperatures below 18°C, provide the hutch with insulating material or heat.
- For protection from predators (dogs/cats), the hutch should be strongly constructed with welded mesh and/or be elevated on stilts.
- The door to the sleeping quarters should be protected from wind and rain to ensure that both the rabbit and its bedding stay warm and dry.

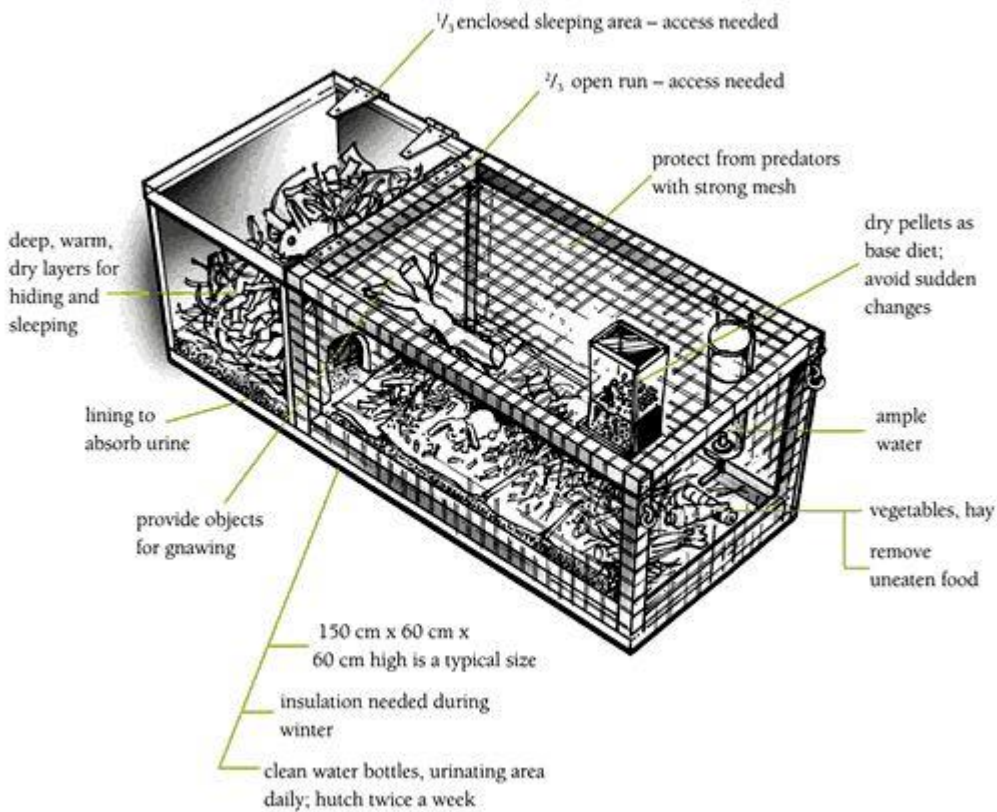
Bedding

- The sleeping area should have a layer of litter about 5 centimetres deep. Litter materials can include kitty litter, untreated sawdust, and wood shavings. Cover the litter with a deep layer of straw or shredded paper. This provides warmth and insulation and a chance for the rabbit to burrow and hide.
- Cover the floor in the run with litter also.
- For ease of cleaning, both compartments may be lined with newspaper, which will absorb a lot of the urine.

Cleaning

- Good hygienic practices reduce unpleasant smells and the risk of disease. Cleaning materials include rubber gloves, a scrubbing brush, a cloth, dishwashing detergent, and water.
- Rabbits tend to use one area to urinate. Clean this area daily.
- The sleeping quarters and run should be cleaned twice a week. If cages are dirty, irritants such as ammonia, moisture, and bacteria may rise to harmful levels, causing illness.
- Each month, wipe all the hutch surfaces with a weak bleach solution (10–20 millilitres of bleach per litre of water). Rinse them well and dry them.

- Every day, wash the water bottles and tubes with detergent and water. Rinse them well. Once a week, disinfect the bottles and tubes with the bleach solution, soaking them for fifteen minutes. Rinse them well and dry them.



optimum temperature range 18-28°C

Hutch diagram explanation

A rectangular hutch 150cm x 60cm x 60cm is shown. The hutch needs insulation during winter and needs cleaning twice weekly. One third of the hutch has a deep, warm, dry area for sleeping or hiding and is separated from the run area by a wall with a small opening for access and covered by a hinged lid. In both areas there is lining to absorb urine that should be changed daily. The run area is covered with strong mesh for predator protection and on the run floor there are objects for gnawing and a branch for climbing. There is a water tube attached to the mesh walls and feeding containers for the dry pellets which are the base diet. Uneaten food should be removed and water tube cleaned daily. Optimum temperature range for rabbits is 18–28°C.

How to care for rabbits

Feeding

- Rabbits are herbivores, and so their diet is based on vegetables.
- Dry pelleted food formulated for rabbits, which is available from pet shops and some veterinarians, is a good base that can be supplemented with fresh, well-washed, raw fruit and vegetables. These are also good for their teeth. Suitable fruits and vegetables include cabbage, cauliflower, pūhā, dock leaves, carrots, swedes, turnips, apples, and pears. Each day, remove uneaten food.

- A supply of good-quality hay is an important source of dietary fibre. Inadequate dietary fibre may lead to enteritis and diarrhoea. Furballs are common in rabbits that have a diet low in fibre. A combination of a high starch intake, such as bread, and low fibre can cause fermentation in the caecum by bacteria that produce toxins. This may kill the rabbit.
- Avoid sudden changes in diet because these may lead to digestive upsets.
- Store dry food in an airtight container in a cool, dry place. Buy only three months' supply at a time to ensure good nutritional value.
- Dry food pellets and water are best supplied in hoppers and bottles that can be attached to the side of the run because rabbits will often dig in open food containers. Wash the food hopper every week.
- A 3.5-kilogram rabbit will drink 175–350 millilitres of water per day. (Calculate water needs as 50–100 millilitres per kilogram per day.)
- Provide a gnawing block. Fruit tree branches are a good source. Remember that many garden plants are poisonous.

Handling

- Never pick a rabbit up by its ears.
- There are two methods you can use to hold your rabbit. Method 1: Place a hand under the rabbit's chest, gripping its forelegs between two fingers. Support its hindquarters with your other hand and cradle the rabbit close to your body. Method 2: With the rabbit facing your elbow, slide your arm underneath the rabbit and grasp its hindquarters so that its body lies over your arm and its legs are held firmly between your fingers. Clutch the rabbit firmly by the scruff of its neck with your other hand and hold it close to your body. You can tuck its head under your elbow to restrict its vision.
- To restrain a rabbit on a table, place a towel on the table's surface so that it is less slippery. Gently clutch the skin behind the rabbit's neck and place your other hand over its hindquarters. Inadequate restraint may result in the rabbit fracturing its spine if it kicks or struggles.
- Always take care when handling rabbits. They have strong hindquarters and will kick and scratch if they are frightened. Some may bite. Daily petting helps to keep them tame and provides an opportunity to check on their health.
- Always supervise any handling of rabbits by students and children.
- Wash your hands after handling rabbits.

Health

- In your daily health check, look for normal activity. Is your rabbit eating and grooming? Check its fur and skin for scabs, scurf (dandruff), bald spots, or itchiness. Check that its eyes, ears, and nose are clear of any discharges and that its faeces and urine are normal. Know what is usual for your rabbit.
- Cleanliness and good nutrition are necessary for rabbits' health.
- Rabbits should be vaccinated annually to protect against rabbit calicivirus.
- The toenails of caged rabbits may not wear down as they would in the wild, and they may become too long. If this occurs, trim them back, taking care not to cut the blood vessel or nerve in the nail quick. Ask a veterinarian to check the rabbit and demonstrate the correct technique.

- Rabbit incisor teeth are open-rooted and grow continuously. To maintain good dentition, rabbits' teeth need constant wear. Provide a sufficient amount of hard food and a gnawing block.
- The condition of rabbits may deteriorate rapidly if their illness is ignored. At any sign of illness, or if you have questions, consult a veterinarian.

Interesting facts about rabbits

- Rabbits are members of the order Lagomorpha. Lagomorphs have six open-rooted incisors (three upper and three lower) compared with the four incisors of other rodents.
- Rabbit digestion also differs from that of other rodents. Their gastrointestinal tract has a simple glandular stomach, a long intestinal tract, and a large caecum. The caecum is the site of bacterial synthesis of B vitamins.
- About one-third of the normal faeces is composed of soft faeces called cecotrophs. Cecotrophs are consumed by the rabbit, usually at night. They are an important source of vitamin B, electrolytes, and nitrogen. The other two-thirds of faeces are hard fibrous pellets that are usually passed during the day.
- In healthy rabbits, urine may sometimes have a red or orange discolouration. This is because of the presence of a porphyrin pigment or a food-related metabolite excreted in the urine.
- The many recognised breeds of rabbits can be divided into three groups:
 - giant breeds, with an average body weight greater than 5 kilograms
 - medium breeds, with a weight range of 3.5–5 kilograms
 - small or dwarf breeds, whose weight is less than 3.5 kilograms.
- Small-to-medium breeds are more suited to the classroom because housing for large breeds takes up more space and the rabbits are usually too heavy for small children to handle.
- Long-haired varieties, such as the angora rabbit, need daily grooming.
- Rabbits are social animals, and so you should house two of the same gender together. Male rabbits are best neutered to help stop them fighting.

Reproduction and development

- Rabbits are prolific breeders. Depending on its size, a female rabbit (doe) may breed at four to eight months old. The males (bucks) reach puberty at six to ten months.
- The does are induced ovulators, that is, the act of mating stimulates their ovaries to release eggs for fertilisation.
- Gestation is usually thirty to thirty-three days, and litters average four to ten kits.
- The kits are born with no fur and with eyes and ears closed. Their eyes open after seven to ten days. Kits leave the nest box at fifteen to twenty days, and they are weaned at four to six weeks old.
- If you are breeding rabbits, you need a special nest box. Line it with straw. The doe will use fur from her abdomen to provide more soft insulating material.

Rats

Housing

The cage

- Housing for rats should be made from materials that are easy to clean, resistant to chewing and gnawing, and impervious to liquids (so that urine and faeces are not absorbed). Commonly used materials include hard plastic, stainless steel, and glass. Check that the lid fits firmly.
- Purpose-built cages of hard plastic are available from pet shops at reasonable prices. They usually provide a box for sleeping and nesting and living quarters. Some provide for additional space if needed.
- Wooden cages are not recommended because they may be gnawed, are difficult to sanitise, and may absorb urine, which creates unpleasant odours.
- Mesh floors are not recommended because the mesh can cause foot injuries.
- Ensure that the cage is big enough to accommodate both the rat(s) and furniture comfortably. A minimum size is 80 centimetres × 40 centimetres × 40 centimetres high.
- Viewing is best from the sides, not the top, because rats are inquisitive creatures and they like to see out.
- Provide a sleeping box and good hiding places in the living area. For example, cardboard tubes provide good tunnels and are easily replaced, and opaque non-toxic jars can be cleaned easily.
- Food containers should be gnawproof. Overhead-rack types are best because they reduce wastage and do not get contaminated by faeces. Containers that attach to sides are also acceptable because they reduce spillage.
- Heavy-duty pottery containers may also be used, but as they can be more easily contaminated by urine and faeces, you should change the food in them daily.
- Open water dishes are not recommended because of possible contamination by faeces, which leads to disease. The water in them can also be easily spilled, leading to dehydration in the rat and an increase in moisture in the cage. Sipper tubes and bottles attached to the sides of the cage work well.
- Provide objects for gnawing, such as a small bark-covered log from an apple tree. Select logs carefully because many garden trees are poisonous.
- Rats need stimulation, so include exercise toys, such as exercise wheels, ladders, plastic tubes, and boxes of different shapes.
- Do not house male rats together because they may fight and severely hurt or even kill each other.

Bedding

- Line the cage with untreated wood sawdust or shavings 2–3 centimetres deep, kitty litter, or shredded plain paper but not newspaper because printing ink may be harmful to the rats.
- The sleeping box should contain shredded plain paper, such as paper towels or tissues, or cotton wool (although this is not suitable for breeding because it may entangle newborns' limbs).

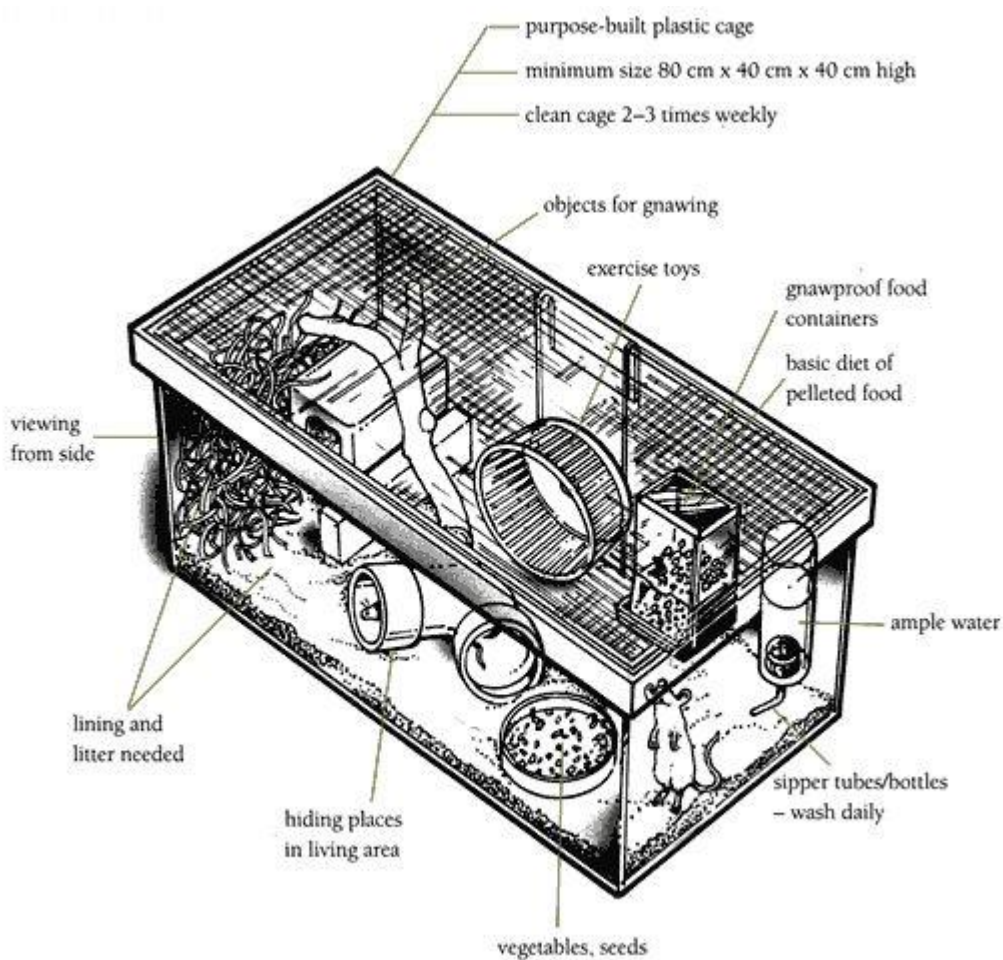
Cleaning

- Clean the cage two to three times a week, using rubber gloves, a scrubbing brush, dishwashing detergent, and water. Rinse it well and dry it.

- If cages are not kept clean, such irritants as ammonia, moisture, and bacteria rise to harmful levels, predisposing the rats to illness. Good hygiene practices reduce both the risk of disease and the smell.
- Disinfect cages and furniture twice a month with a weak bleach solution (10–20 millilitres of bleach per litre of water), leaving them to stand for at least fifteen minutes in the solution.
- Clean water bottles and tubes daily with detergent and water and disinfect them weekly with a weak bleach solution. Soak them for at least fifteen minutes and rinse them well.

Environmental factors

- The optimum temperature range for rats is 18–29°C. Keep their cage out of direct sunlight.
- Rats prefer a light cycle of twelve to fourteen hours of light and ten to twelve hours of dark.



- optimum temperature range 18-29°C
- indirect sunlight

Cage diagram explanation

Made of clear plastic, the cage has a well-fitting lid.

Place the cage out of direct sunlight, and clean it two to three times a week.

The cage floor should have lining and litter.

At one end of the cage there is a small sleeping box.

Inside the cage there are objects for gnawing, exercise toys like a rotating wheel and gnaw-proof, feeding containers for pelleted food, and a container containing vegetables or seeds

There are also tubes for hiding and a climbing branch.

Sipper tubes or bottles are attached to the side of the cage, and these should be washed daily.

How to care for rats

Feeding

- The dietary requirements of rats are similar to those of mice, but because of their larger body size, rats consume more food. They do well on pelleted food as their staple diet, and this food is also good for their teeth.
- Feed them seeds and some raw vegetables, such as carrots, swedes, and apples, as treats. However, if the rats are not used to these foods, they may develop a mild diarrhoea that usually doesn't last long.
- Store their dry food in an airtight container in a cool, dry place. Buy only three months' supply at a time to ensure good nutritional value.
- Change their drinking water daily. A rat will drink 25–50 millilitres of water a day.

Handling

- Do not lift a rat by its tail. Pick up your rat by cupping your hands around it to make a cradle for it to sit in or gently placing a hand around its chest and lifting it onto your other hand. Stroke the rat gently. Rats will bite when they are handled roughly, frightened, or hurt.
- Daily handling helps to keep rats tame and provides an opportunity to check on their health.
- Always supervise children and students when they are handling rats.
- Wash your hands after handling rats.

Health

- Do a health check each day. Look for normal activity. Is the rat eating and grooming itself? Check that its fur appears normal and that it has no scabs or bald spots, that its eyes, ears, and nose are clear of discharges, and that its faeces are normal. Know what is usual for your rat.
- Changes in temperature and an increase in the level of ammonia because of poor hygiene in the cage may cause rats to develop respiratory disease. Stress may also contribute to this.
- Gastrointestinal problems can be caused by unclean food containers, contaminated food, or eating unfamiliar foods.
- Rats may be affected by viral, bacterial, and parasitic conditions. If there are any signs of illness, or if you have questions, consult a veterinarian.

A rectangular purpose-built plastic cage is shown with a minimum size of 80cm x 40cm x 40cm high. It is clear plastic with a well-fitting lid. The cage should not be in direct sunlight and cleaned 2–3 times weekly. Lining and litter are needed for the cage floor. At one end of the cage there is a small sleeping box. Inside the cage there are objects for gnawing, exercise toys like a rotating wheel and gnawproof, feeding containers for pelleted food and a container containing vegetables or seeds. There are also tubes for hiding and a climbing branch. Sipper tubes or bottles are attached to the side of the cage and these should be washed daily.

Interesting facts about rats

- Rats come in many varieties and colours.
- Before puberty, two males or two females will usually live together happily in one large cage. However, a single rat may live happily provided it has enough human companionship.
- Rats are rodents and have open-rooted teeth, and so constant wear is necessary to maintain good dentition.
- Rats live from two to four years.
- The female rat may breed as early as six to twelve weeks of age.
- Gestation is twenty-one to twenty-three days, and the average litter is six to fourteen babies.
- Baby rats are born with their eyes closed and are helpless, and so it is important not to disturb the nest at this time. Their eyes open at twelve to seventeen days, and they are weaned when they are twenty-one days old.
- Females may mate immediately after the birth of a litter, and so as one litter is weaned, the next litter is born.
- Males reach puberty at six to twelve weeks of age.
- At four to five weeks of age you can determine the gender of the young and segregate the males from the females.

Slaters

Housing

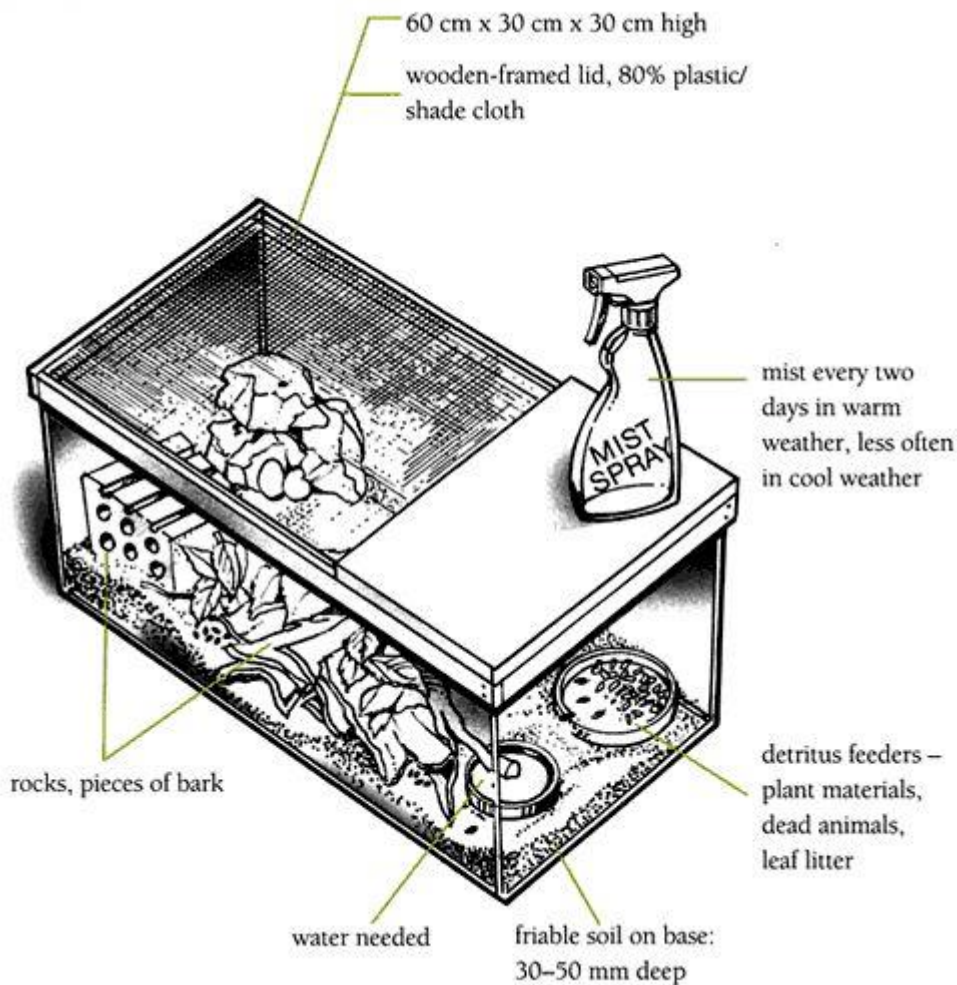
The tank

- Slaters need a glass tank 60 centimetres × 30 centimetres × 30 centimetres high with a wooden or steel lid, 70 percent of which is covered with plastic or steel insect mesh or shade cloth for ventilation.
- On the base, provide friable soil 30–50 millimetres deep and mounded to assist drainage.
- Provide a few rocks so that the slaters can climb off the soil and some places for them to hide. Pieces of rotten wood, bricks, or stones in layers will provide very thin spaces for slaters to creep into. Some species of slaters prefer to shelter in large groups and are attracted by other individuals, so their shelter should be large enough for this to occur.

Environment

- A dark, well-ventilated part of the room away from sunlight is the best site for the slater enclosure.
- Slaters can survive at room temperatures of 10–20°C, but they are not very tolerant of temperatures above this. The average should be 14–18°C.
- Humidity levels are also important. These can vary from 50 to 70 percent, but the space under the shelter should be only slightly damp. You can obtain the correct humidity levels within the enclosure by misting every second day during dry weather and every fourth or fifth day in cool and/or damp weather. Once the enclosure is set up, the slaters will move into the areas that best suit their feeding or resting requirements.

Tank diagram



- room temperature range 10-20°C
- keep in dark, well-ventilated area

Tank diagram explanation

A glass tank measuring 60cm x 30cm x 30cm high is shown with a wooden framed lid which is three quarter plastic or shade cloth. The cage should be kept in a dark well-ventilated area. There is a mist bottle on top of the cage to denote misting every two days in warm weather, less in cooler weather. On the tank floor there are rocks and pieces of bark and friable soil 30-50cm deep. Slaters are detritus feeders and need plant materials, dead animals and leaf litter in the a feeding lid. Room temperature range for slaters 10-20°C.

How to care for slaters

Feeding

- Slaters are detritus feeders, eating mainly plant materials but also scavenging on dead animals. Good-quality leaf litter in the enclosure will provide a source of readily available food.
- Slaters will also feed on tender seedlings, dried fish food (flakes), or soaked cat biscuits. Place these in an upturned lid.
- Replace the leaf litter regularly, taking care not to remove the slaters themselves.

- Pay particular attention to the condition of the leaf litter. This must include leaves in different degrees of decomposition because slaters can be selective about the state of decay of the leaf litter that they eat.
- Provide water for drinking in a shallow lid no deeper than 10 millimetres and replenish it daily.

Snails (garden)

Housing

Note that you are not permitted to keep native species of snails without a permit from the Department of Conservation (see [The Wildlife Act 1953](#)).

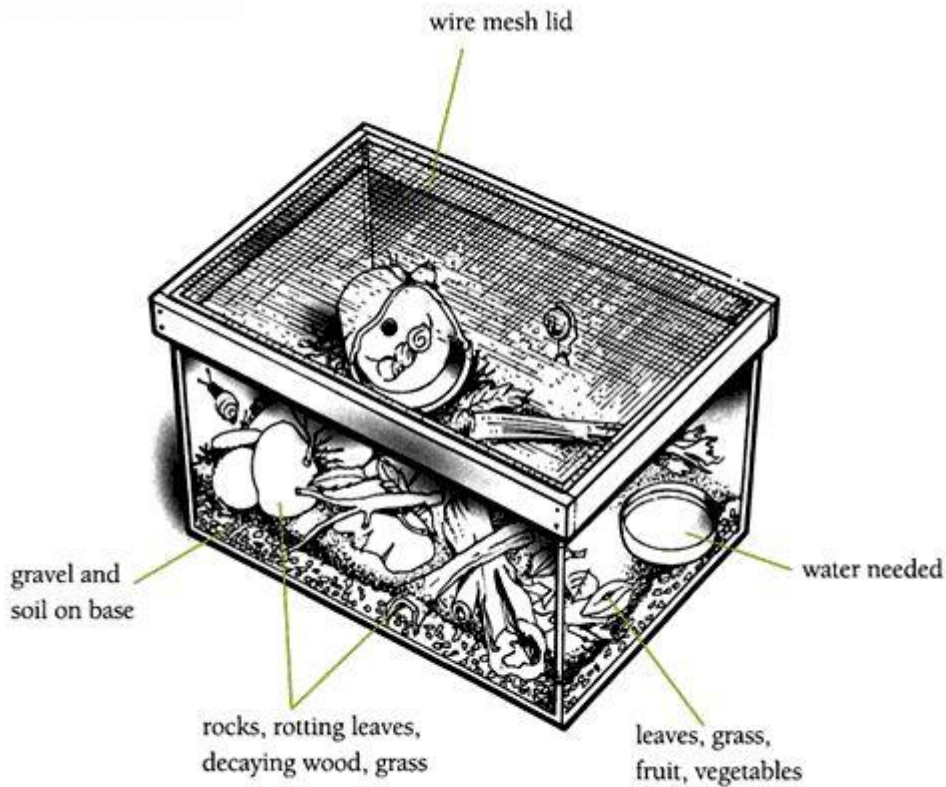
DOC Snail Identification Information

The vivarium

- You can make an ideal vivarium for garden snails from an aquarium or a box with a wire mesh lid.
- Line the vivarium with a layer of gravel and then a layer of moist garden soil. Add some rotting leaves, a few rocks, some decaying wood, a branch, and a few handfuls of grass.
- Place the vivarium where it receives only dull light because snails like cool, moist, darkish conditions.
- Ensure that the vivarium lid fits tightly to keep out predators and to keep the snails in.
- If conditions are not right – if it is too hot, too cold, or too dry – each snail will curl up inside its shell, seal a thin "door" behind it, and wait for more favourable conditions.

Cleaning

- When cleaning the vivarium, never use soap or detergent because these may kill the snails. Instead, use salt or bicarbonate of soda as an abrasive and then rinse thoroughly.



- dull light
- cool, moist conditions

Vivarium diagram explanation

The vivarium shown is a box or aquarium with a wire mesh lid. It needs to be in dull light and cool, moist conditions. On the base of the vivarium there is gravel or soil, rocks, rotting leaves, decaying wood and grass. Water is needed in a small container and food in the form of leaves, grass, fruit and vegetables.

How to care for snails

Feeding

- In their natural setting, snails eat leaves, grass, fruit, and bark, but they will appreciate more variety and treats, such as moist, leafy, green vegetables. Experiment with different vegetables and fruits. A diet of lettuce alone is not recommended and could cause ill-health. Rotting leaves and natural foods will ensure that the snails grow strong shells and live healthy lives.
- Provide a small bowl of water.

Interesting facts about snails

- The common garden snail has a fleshy mouth and a sharp, hard jaw with thousands of tiny teeth covering its tongue. Snails produce slime to help them glide safely across surfaces.
- Snails are hermaphrodites, that is, they are both male and female, but they still need to mate to produce fertile eggs.

- Each snail may lay two hundred to four hundred eggs every season, in clumps of about forty, in a protective layer of slime in damp soil.
- It takes two years for a snail to reach maturity, and it can live for eight years.

Teacher resource for investigating Garden Snails. (Although this is not a New Zealand based resource, it is still a very useful tool for teachers)

Terrapins

Housing

The vivarium

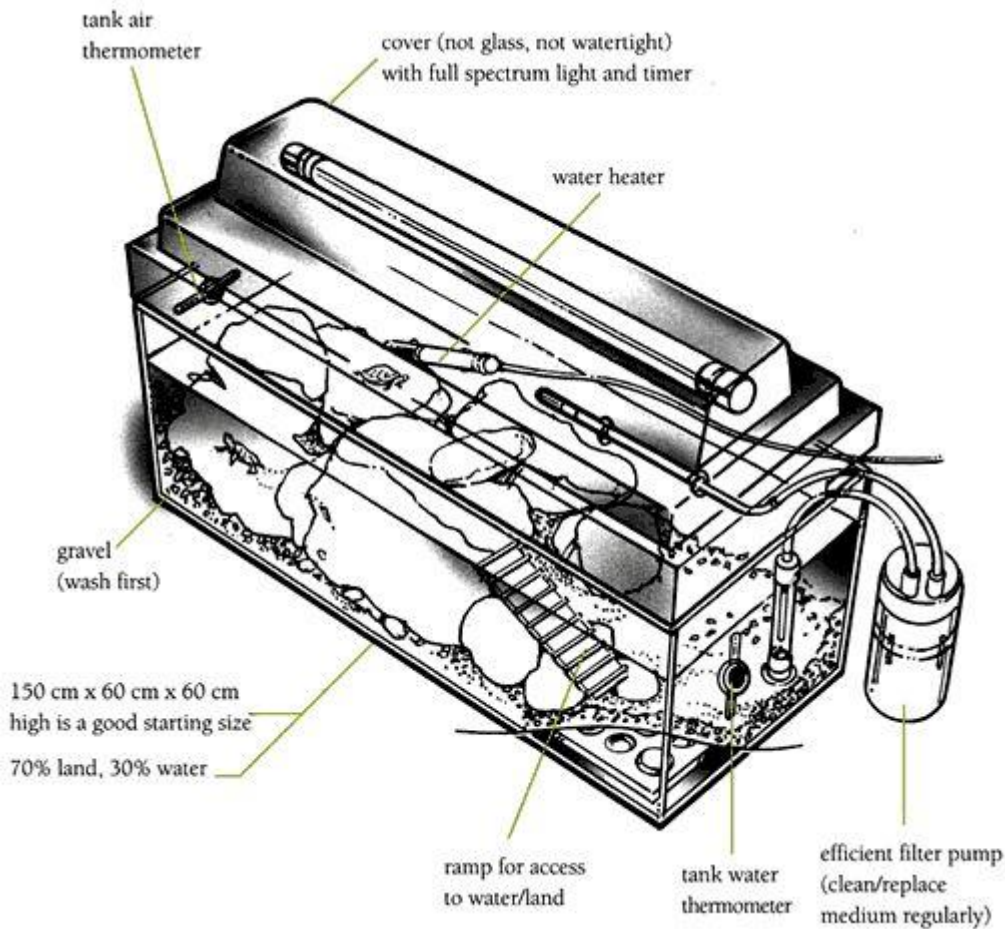
- Terrapins need a land area in their glass tank on which to rest, bask, and walk around and an area of fresh water in which to feed and swim. Provide a ramp for easy access between the areas. A ratio of 70 percent land to 30 percent water is adequate. Allow 1 square metre per terrapin. A good-sized glass tank is 150 centimetres × 60 centimetres × 60 centimetres high.
- Do not use a glass or watertight cover for the tank. A metal cover is preferable.
- Terrapins need a full-spectrum light to mimic the radiant energy of the sun, which is necessary for them to manufacture vitamin D, which is important for good bone and shell health. The light is usually contained within the cover. It should be situated over the land area on a timer switch to regulate the night/day cycle.
- Use a tank thermometer to measure the temperature. For their body systems to function, terrapins need an ambient temperature range of 20–30°C for adult terrapins and slightly higher (25–30°C) for juveniles. A water heater will maintain the water temperature at 25°C, but a tank in direct sunlight, especially during the summer and by a window, may overheat.
- A water filtration system removes small particles of debris and clears the water, but even with filtration, tank water needs changing regularly. Large external tank filters are best. A hose sucks up water from the bottom of the tank, passes it through a filter that removes the waste matter and dissolved toxins from the water, and pumps the cleaned water back into the tank.
- Gravel rocks are easy to clean. Too many large rocks may impede under-gravel filtration systems. The amount of gravel needed depends on the type of filtration system.


Maintaining the vivarium

- Uneaten food and faecal material left in the water during warm conditions provide the ideal media for pathological (disease-causing) bacteria to grow. To manage terrapins successfully, keep the water clean.
- If there is no filtering system, remove faecal material every day and remove any uneaten food after twenty minutes. Clean the tank and the rocks and replace the water twice a week.
- With a filtering system, replace half of the water each week. If gravel is used in the tank, rake it through so that the debris is removed with the dirty water. Remember to replace it with clean, warm water.
- Clean and/or replace the filter medium regularly, usually every two to four weeks. Read the filter instructions carefully. If you use under-gravel filtration, do not soak the gravel in bleach solution during cleaning because this kills useful bacteria. Instead, wash it gently with unchlorinated water until the water runs clear.
- Clean the tank and its contents about every two weeks, depending on the type of filter used. Use buckets, towels, sponges, salt, and bleach. To do this:
 - place the terrapins in one bucket, the tank materials and equipment in another, and reusable gravel in a third bucket
 - soak the tank equipment and gravel in a weak bleach solution of 10–20 millilitres of bleach per litre of water for fifteen minutes
 - wipe the equipment over and rinse it several times in clean water
 - refill about a quarter of the tank with clean water and use salt to remove deposits from the glass
 - rinse the tank thoroughly with clean water and dry it
 - refill the tank with warm water at 25°C and replace the remaining tank materials and equipment before putting the terrapins back. Rain or filtered water is the ideal, but if only tap water is available, ensure that it stands for twenty-four hours beforehand to dissipate the chlorine.

- Wash your hands after cleaning the tank.

Vivarium diagram



 ambient temperature range 20–30°C

- varied diet
- 0.5–1 cm-sized cubes of food
- preferably feed in second tank
- replace half water twice weekly; allow chlorine to evaporate
- clean every two weeks.

Vivarium diagram explanation

A glass tank measuring at least 150 cm x 60cm x 60cm is shown. The cover is not glass or watertight and has a full spectrum light and timer. There is a tank air thermometer and a water heater. A water pump is attached to the tank and needs to be cleaned or replaced regularly. A water thermometer is also attached to the inside of the glass. On the floor of the tank there is washed gravel, small rocks, and rocks that protrude from the water, and a ramp for access to water or land. Ideally there is a separate feeding tank. Diet should be varied and provided in 0.5- to 1-cm sized cubes. Half the water should be replaced twice weekly and the chlorine allowed to evaporate after refilling. The tank needs cleaning every two weeks. Ambient temperature range for terrapins 20–30°C.

How to care for terrapins

Feeding

- Terrapins are omnivores and are messy feeders. An adult terrapin's diet may include fresh, small, whole fish, whitebait, tadpoles, freshwater shrimp, freshwater snails, tinned dog/cat food, dry cat food (soaked in water for five minutes), trout pellets, earthworms, cubes of cheese and hard-boiled egg, watercress, duckweed, silverbeet, or spinach. Commercially prepared foods are also available. Terrapins may swallow

small-sized gravel if their diet is inadequate.

- Adults may be fed small daily meals or a larger meal every two to three days. Juveniles should be fed daily, separately from the adults.
- Terrapins feed in the water by sight. Ideally, feed them in a second tank of deep, warm water. This helps to keep the main tank clean and provides deep-water swimming exercise. You could use a bucket of warm water instead. If it is not practical to provide a second tank, remove all uneaten food after twenty minutes.
- Food should ideally be in cubes of 0.5 to 1 centimetre so that the terrapins can grab and swallow it. They will grip and shake larger bits of meat to break off smaller pieces.
- Place vitamin and mineral supplement powders inside cubes of food so that these supplements are not lost into the water.
- Do not put your fingers into the feeding tank. Use iceblock sticks to introduce the food.

Handling

- Terrapins are strong and can be aggressive. They can and do bite. A useful way to hold them is to hold their carapace (shell) between your thumb and forefinger just in front of their hind legs. After they have been held on their backs for fifteen to twenty seconds, they will remain quiet for a short period of time when righted.
- Limit the time that terrapins are handled, and always wash your hands thoroughly afterwards because terrapins can carry salmonella. Symptoms of salmonellosis infection usually include vomiting and diarrhoea.

Health

- Maintaining high standards of hygiene and nutritional care is required for terrapins' good health. Nutritional diseases of the skin, eye, shell, and bone caused by inadequate amounts of vitamins A, B, and D and incorrect levels of calcium and phosphorus are the most common problems.
- Inadequate hygiene may also cause terrapins to contract bacterial and fungal illnesses.
- Ill terrapins that need nursing and medication should be kept in ambient temperatures of 25–30°C. This keeps their body metabolism up and ensures that medications have an opportunity to work.
- Prevention is the best cure. During their daily health check, look for normal activity and appetite. Check that the terrapin's eyes and nose are clear of any discharges and that its faeces are normal. Its shell should be firm and solid to touch and its legs strong. At any sign of illness, or if you have questions, consult a veterinarian.

Interesting facts about terrapins

- The terrapins kept in New Zealand are red-eared terrapins (*Pseudemys scripta elegans*). Terrapins are native to the warm tropical areas of South-east Asia and Central America.
- The names terrapin, turtle, and tortoise can cause confusion. Turtles are sea chelonians, tortoises are land chelonians, and terrapins are freshwater chelonians that spend some time on land. All chelonians have hard shells to provide protection, and these make up 30 percent of their body weight. Unlike claws, nails, and beaks, a terrapin's shell is living, and so it should never be cut or trimmed because this would cause the animal extreme pain.
- The horny (cartilaginous) beak of a terrapin grows continuously.
- Terrapins are ectothermic, and so they depend on the environment to provide their body warmth. In their natural environment, they would bask in the sun to gain heat and shelter in shade to promote heat loss.

- Terrapins are aggressive and will bite. They may also 'bark' when angry.
- Terrapins in New Zealand are usually infected with salmonella bacteria. This is a zoonotic disease, which means that contact with infected animals can infect human beings.
- Male red-eared terrapins have very long claws on their forefeet and longer, thicker tails than the females. It is difficult to tell the gender of a terrapin until it is eighteen to twenty-four months old. Females may breed at three to four years of age, but this timing seems to be related more to size than to age.
- Females may produce fertile eggs several years after mating. A special sandpit is needed for a nest. The females will dig a nest about 10–15 centimetres deep into which they first urinate and then lay their eggs. They then carefully cover their eggs. The eggs need incubation temperatures of 29–32°C for sixty days before hatching.
- Terrapins may live for up to thirty years.

Housing

The bin

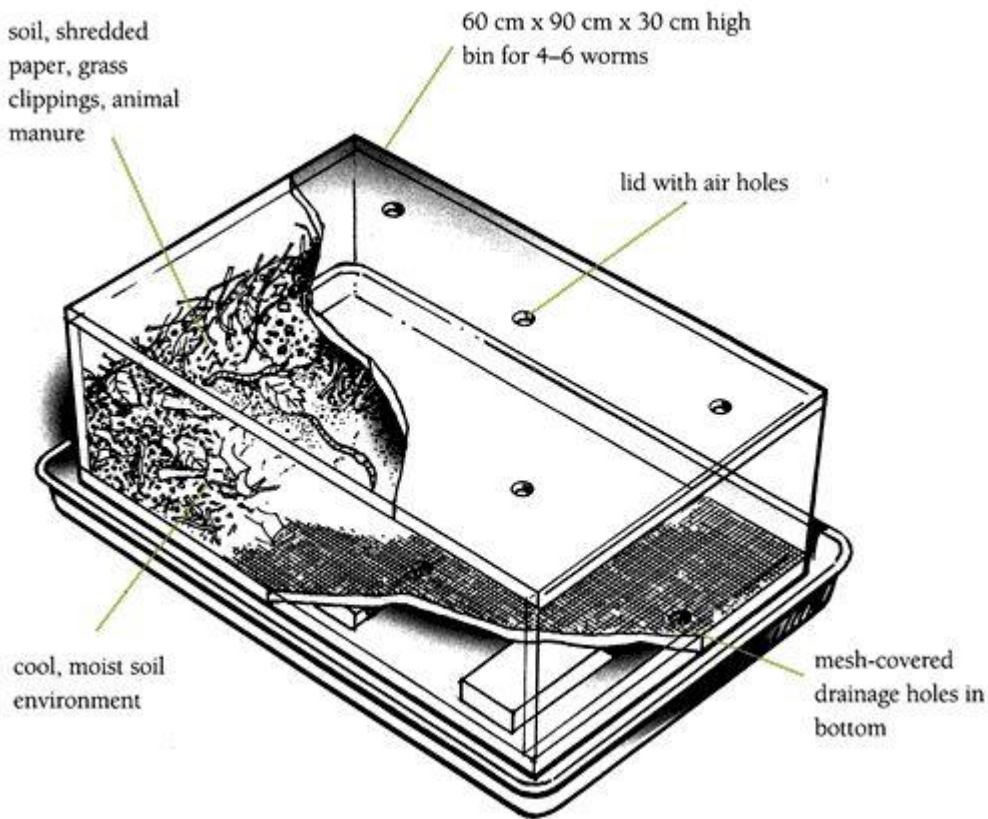
- Provide worms with a cool, damp soil environment that is similar to their natural home.
- A family of four to six worms needs a bin about 30 centimetres high, 60 centimetres wide, and 90 centimetres long. This will be big enough to eventually hold several thousand worms.
- Make sure that even though the bin's lid has air holes, it keeps out most of the light. Worms need air to breathe, but they are sensitive to light.
- The bin should also have holes in the bottom to let water drain away. Sit it on a tray to catch the water. The bottom of the bin should be covered with fine nylon mesh to stop the worms escaping through the drainage holes.
- Place the bin in a spot that has good air circulation.
- The ideal temperature range is 13–25°C. If the temperature rises to more than 29°C, the worms can die. They will also die if they are allowed to freeze.

The bedding

- Half-fill a bin with soil and shredded paper. Other materials, such as grass clippings, dried leaves, animal manure, and straw, are also suitable.
- Dampen the bedding because worms need to stay moist so that they can breathe. If the bedding is too dry or too wet, the worms will die.

Worms (compost)

Bin diagram



temperature range 13–25°C

- feed once or twice a week
- finely chopped kitchen scraps
- give crushed eggshells at least once a week
- dull light.

Bin diagram explanation

The bin shown measures 60cm x 90cm x 30cm high and is big enough for 4–6 worms. The lid should keep out light and have air holes. The bin floor has mesh covered holes to let water drain away. The floor should be a cool, moist soil environment consisting of soil, shredded paper, grass clippings, and animal manure. Worms should be fed once or twice a week with finely chopped kitchen scraps and be given crushed eggshells at least once weekly. Temperature range for worms 13–25°C.

How to care for worms

Feeding

- Feed worms once or twice a week.
- Make a shallow hole in the bedding and place finely chopped kitchen scraps in the hole. Worms cannot eat large chunks of food.
- Worms will eat any leftover food, but avoid meat, cheese, and other animal products because such food smells as it decays and can attract rats.
- Add crushed eggshells at least once a week because they contain nutrients that worms need.

- Cover the scraps with bedding and put them in a different place each time.
- Each day, one worm will eat about half the amount of its body weight.

Handling and health

- Monitor the temperature in the bin and the amount of food and water the worms have been given. Check that the bedding remains moist.
- Refresh the bedding several times a year. In two to three months, worms will eat through their bedding and build up a large number of castings. If the bin has too many castings in it, the worms will get sick.
- Before changing the bedding, you first need to remove the worms. To do this, dump the contents of the worm bin onto a large plastic sheet and sort it into little piles. Brush some of the soil off each pile. As they are exposed to the light, the worms will move to the centre of each pile, enabling you to pick them up and place them in a clean container. Do the same for each pile until all the soil has been removed.
- Refill the bin with fresh bedding and gently place the worms onto the surface. You can use the old soil as compost in the garden.

Other classroom and early childhood centre (ECE) pets

Chickens

It is important that chickens receive adequate food, water, and warmth and that they are stroked rather than handled excessively.

Raising Chickens at School Resource

Frogs

NZFROG Information & resources on frog conservation.

[New Zealand Frogs Resource](#)

Monarch Butterflies

See *Pet Bugs: A Kids' Guide to Catching and Keeping Touchable Insects* by Sally Kneidel.

Resources

[The New Zealand Science Teachers' Association \(NZASE\) | Resources for animal ethics](#)

NZASE provides a code of conduct and guidance for teachers on both animal and human ethics.

[Code of ethical conduct for the use of animals in research and teaching in schools, home schools and early childhood centres](#) (Published 2019)

[The NZASE Ethics Committee](#) was set up in 2005 to help schools, home schools and early childhood centres meet those legal requirements. The Committee administers an approval process for school projects involving animals.

[Australian and New Zealand Council for the Care of Animals in Research and Teaching \(ANZCCART\)](#)

ANZCCART is an independent body which was established to provide a focus for consideration of the scientific, ethical and social issues associated with the use of animals in research and teaching.

[Ministry of Primary Industries \(MPI\) | Animal welfare legislation](#)

MPI leads and facilitates the management of animal welfare policy and practice in New Zealand. MPI promotes policies for the humane treatment of animals and is an important participant in the ongoing animal welfare debate. MPI's animal welfare mission is:

[The New Zealand Animal Welfare Strategy](#) sets out a high-level framework for how animals are treated in New Zealand and provides a formal foundation for New Zealand's animal welfare legislation and policy.

[Royal Society | CREST and ethics](#)

Information for students and teachers about ethical standards which must be accepted prior to CREST project approval.

Glossary

ambient	surrounding
carapace	a shield covering the back of an animal such as a crab, terrapin, or tortoise
detritus	debris, rubbish, waste
ectothermic	depending upon warmth from outside the body
food-related metabolite	a product resulting from food breakdown by digestion
nitrifying bacteria	bacteria that can reduce the level of ammonia by converting it to other substances
omnivore	an animal that feeds on both plant material and flesh
poikilothermic	cold-blooded (not needing warmth to function)
porphyrin pigment	an abnormal pigment in the urine that turns dark red on standing
prophylaxis	cautionary measures to prevent disease
vivarium	a place for keeping animals in as near to their natural state as possible, such as an aquarium or a terrarium

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