**ACTIVITY: Caring for earthworms in the classroom**

**Activity idea**

In this activity, students consider the ethical issues involved with keeping earthworms (and other animals) captive in a classroom setting.

By the end of this activity, students should be able to:

* list the five freedoms that all animals should experience
* describe the optimal conditions for keeping earthworms in the classroom based on the five freedoms and their knowledge of earthworm life processes
* review the conditions under which the class is housing, handling and studying their earthworms.

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**Introduction/background**

The experience of caring for earthworms in the classroom provides a practical setting for students to consolidate the various science ideas and concepts they have been learning regarding earthworm life processes and habitats. It is also an opportunity for students to consider and discuss the ethics involved with keeping pets or other animals in the classroom.

The Animal Welfare Act 1999 details five actions that owners or others in charge of animals must take to ensure animals’ physical, health and behavioural needs are met. These are sometimes referred to as the five freedoms:

* Proper and sufficient food and water.
* Adequate shelter.
* Opportunity to display normal patterns of behaviour.
* Physical handling in a manner that minimises the likelihood of unreasonable or unnecessary pain or distress.
* Protection from and quick diagnosis of any significant injury or disease.

In this activity, students consider the needs of more widely known animals and compare them with the needs of earthworms. They then integrate their knowledge about earthworm life processes with the five freedoms to describe the optimal conditions for keeping earthworms in the classroom.

See [Legal and ethical guidelines for keeping earthworms in the classroom](#legal).

**What you need**

* Access to *Caring for Animals: A guide for teachers, early childhood educators and students* (Learning Media, 1999) or the [online version](http://scienceonline.tki.org.nz/Teaching-science/Ethics/Caring-for-Animals)
* Copies of [the five freedoms](#five)
* Copies of the student worksheet [Ethical considerations when keeping earthworms in the classroom](#ethical)
* Access to the articles [Characteristics of living things](https://www.sciencelearn.org.nz/resources/14-characteristics-of-living-things), [Niches within earthworms’ habitat](https://www.sciencelearn.org.nz/resources/7-niches-within-earthworms-habitat), the [Earthworm adaptations](https://www.sciencelearn.org.nz/resources/17-earthworm-adaptations) and the slide show [Common New Zealand earthworms](https://www.sciencelearn.org.nz/embeds/93-common-new-zealand-earthworms-slide-show)

**What to do**

1. Have students pair up. Ask them to think of the requirements people should consider when looking after an animal like a dog or goldfish. Have students record their ideas for use later in the activity.
2. Show students the front cover of the Ministry of Education’s *Caring for Animals*: *A guide for teachers, early childhood educators and students* (Learning Media, 1999) or the [online version home page](http://scienceonline.tki.org.nz/Teaching-science/Ethics/Caring-for-Animals). Explain that the guide has information about looking after animals in the classroom.
3. Ask students to consider whether the guide should have a section on dogs. Give students 30 seconds to give a yes/no answer to their partner along with their justification and another 30 seconds for the partner to respond. Ask student pairs to consider whether the guide should have a section on goldfish, following the same procedure as above. Finally, ask students whether the guide should have a section on earthworms, allowing time for the pair to answer and justify their responses.
4. There may be some confusion regarding whether earthworms are actually animals. If this is the case, refer to the article [Characteristics of living things](https://www.sciencelearn.org.nz/resources/14-characteristics-of-living-things) to correct any misunderstandings.
5. Gather feedback on the three questions (dogs, goldfish, worms) with a show of hands or by having the students line up on a yes/no continuum. Students should be prepared to justify why they’ve chosen their responses. (Both goldfish and compost worms have sections on care and housing in *Caring for Animals*. Dogs do not because they are rarely kept as classroom pets. Give this information to the students but do not let them have access to *Caring for Animals* just yet.)
6. Return to the students’ initial written notes on caring for animals. Use this information to compile a class list of things to consider when looking after animals.
7. Show students [the five freedoms](#five) from the Animal Welfare Act. Discuss how these compare with their class list. (You may need to explain or modify some of the vocabulary in the five freedoms for younger students.)
8. Hand out copies of the student worksheet [Ethical considerations when keeping earthworms in the classroom](#ethical) and ask students to apply the five freedoms to earthworms. Encourage them to refer to the articles [Niches within the earthworms’ habitat](https://www.sciencelearn.org.nz/resources/7-niches-within-earthworms-habitat) and [Earthworm adaptations](https://www.sciencelearn.org.nz/resources/17-earthworm-adaptations) if they need more information about earthworm needs.

1. Review the completed worksheets with the students – see [Ethical considerations – possible responses](#reponses). Use the information to describe the optimal conditions for earthworms kept in the classroom or at school. Discuss whether the class methods of housing, handling and studying earthworms have met the five freedoms. If not, what changes can be made to ensure they are?

**Extension ideas**

* The NZASE Animal Ethics Committee Code of Ethical Conduct states: “The NZASE recognises the need for animal experimentation in society and that the use of animals in teaching and investigations in schools has a cost that must be weighed against the potential benefit obtained.” Students may wish to research and debate the benefits and costs of using animals in education. Should students actually handle earthworms for observation or should they use the Science Learning Hub videos to learn about earthworms’ physical characteristics? Are there benefits to doing earthworm dissections instead of using virtual dissections? For guidance on how to facilitate class discussions on ethical issues, refer to the teacher resource [Managing classroom discussions](https://www.sciencelearn.org.nz/resources/198-managing-classroom-discussions).
* Scientists classify earthworms and other invertebrates as animals. Encourage students to read the Wildlife Act 1953, the Animal Welfare Act 1999 or other local legislation to view their definitions of the word ‘animal’. Why do you think different definitions exist?
* Visit the school library (or second-hand bookshops) to look for older books educating children about earthworms. Some of the books have activities that might surprise us today but were acceptable in the 1960s or 1970s. These include cutting earthworms in half to see if their tails grow back. One activity used electric shocks to see if earthworms could learn to move through mazes. Ask students to write a review of the book to be handed to the librarian when the book is returned.
* Use information from the student worksheet [Ethical considerations when keeping earthworms in the classroom](#ethical) to evaluate the ‘How to care for worms’ section of *Caring for Animals*.

**The five freedoms**

The Animal Welfare Act 1999 details five actions that owners or others in charge of animals must take to ensure animals’ physical, health and behavioural needs are met.

These are sometimes referred to as the five freedoms:

* Proper and sufficient food and water.
* Adequate shelter.
* Opportunity to display normal patterns of behaviour.
* Physical handling in a manner that minimises the likelihood of unreasonable or unnecessary pain or distress.
* Protection from and quick diagnosis of any significant injury or disease.

**Ethical considerations when keeping earthworms in the classroom**

There are five actions that people in charge of animals must take to ensure animals’ physical, health and behavioural needs are met. They are sometimes referred to as ‘freedoms’. Use your knowledge of earthworms to fill in this table.

|  |  |  |  |
| --- | --- | --- | --- |
| **FREEDOM/NEED** | **What does this mean for an earthworm?** | **Considerations, e.g. does this differ between earthworm species?** | **How can we provide this in the classroom?** |
| **Plenty of appropriate food and water** |  |  |  |
| **Adequate shelter** |  |  |  |
| **Opportunity to display normal patterns of behaviour** |  |  |  |
| **Handling them in a gentle and appropriate way** |  |  |  |
| **Protection from injury or disease** |  |  |  |

**Ethical considerations – possible responses**

|  |  |  |  |
| --- | --- | --- | --- |
| **FREEDOM/NEED** | **What does this mean for an earthworm?** | **Considerations, e.g. does this differ between earthworm species?** | **How can we provide this in the classroom?** |
| **Plenty of appropriate food and water** | * Vegetable/food scraps.
* Leaves.
* Compost and/or moist soil.
 | * Tiger worms and other epigeic earthworms eat vegetable/food scraps.
* Some endogeic earthworms eat organic matter in soil.
* Anecic earthworms such as the nightcrawler eat leaves.
 | * Feed the appropriate food to the various earthworm species.
* Keep all earthworms moist.
 |
| **Adequate shelter** | * Protection from direct sunlight and heat.
* Cool conditions.
* Moist compost or soil – not too dry or too wet.
 | * Compost for epigeic earthworms.
* Soil for endogeic and anecic earthworms.
 | * Keep out of direct sunlight or place in bins outdoors in a shady area.
* Protect from dry conditions.
* Allow excess rain to drain.
 |
| **Opportunity to display normal patterns of behaviour** | * Chance to burrow, eat and reproduce.
 | * Provide compost for epigeic earthworms to burrow through.
* Provide soil for endogeic earthworms.
* Anecic species like to burrow quite deeply.
 | * Think about the kinds of worms that are easy to keep, for example, compost worms.
* Only keep deep burrowers like nightcrawlers for a short time then release them.
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| **Handling them in a gentle and appropriate way** | * Minimal, careful handling.
 | * Applies to all species.
 | * Only have them outside of the soil briefly so their skin does not dry out.
* Not being squeezed or pulled from burrows.
* Protection from bright light or heat.
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| **Protection from injury or disease** | * Gentle handling.
* Enough food.
* Correct living conditions.
 | * Applies to all species.
 | * Don’t pick them up too often.
* Observe for brief amounts of time.
* Remove rotting or uneaten food.
* Keep the soil or compost moist – not too dry or too wet.
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**Legal and ethical guidelines for keeping earthworms in the classroom**

There are numerous educational benefits to keeping animals in the classroom, but this does come with responsibilities. The New Zealand Government, Ministry of Education and the New Zealand Association of Science Educators have various laws and guidelines relating to the use of small animals for research and teaching.

Below is a brief overview of relevant legal, ethical and practical guidelines when keeping animals in the classroom, with specific reference to earthworms. The web links provide more comprehensive information about these laws and guidelines and how they apply to other animals.

***Wildlife Act 1953***

According to the [Wildlife Act 1953](http://www.legislation.govt.nz/act/public/1953/0031/latest/DLM276814.html), it is illegal to keep any species of native animal without a permit from the Department of Conservation. The Act declares a number of terrestrial and freshwater invertebrates to be animals, but earthworms are not specifically mentioned.

***Animal Welfare Act 1999***

The [Animal Welfare Act of 1999](http://www.legislation.govt.nz/act/public/1999/0142/latest/DLM49664.html) governs the wellbeing of animals in New Zealand. The Act applies specifically to vertebrate animals but recommends the principles also be applied to other species of animal kept in the classroom:

* Provision of proper and sufficient food and water.
* Provision of adequate shelter.
* Provision of the opportunity to display normal patterns of behaviour.
* Physical handling in a manner that minimises the likelihood of unreasonable or unnecessary pain or distress.
* Protection from or rapid diagnosis of significant injury or disease.

***New Zealand Association of Science Educators (NZASE)***

The NZASE provides resources on [animal ethics](https://nzase.org.nz/animal-ethics/resources-for-animal-ethics/). These include the NZASE code of ethical conduct for the use of animals in research and teaching in schools and early childhood centres, guidelines on what type of activities require ethical approval and application forms for approval.

Earthworms used for teaching or research purposes do not require ethical approval from the NZASE. However, contact the NZASE Animal Ethics Committee if you are unsure or would like further information.

***Ministry of Education guidelines***

The Ministry of Education produced *Caring for Animals: A guide for teachers, early childhood educators and students* (Learning Media, 1999). There is also an [online version](http://scienceonline.tki.org.nz/Teaching-science/Ethics/Caring-for-Animals). This document outlines the benefits of keeping animals in the classroom and provides information on national guidelines and policies. *Caring* *for Animals* lists a number of animals suitable for classroom care and study. This includes compost earthworms and gives information on their housing and care.

Should teachers choose to do dissections, there are factors to consider. Refer to the Ministry of Education’s *Safety and Science: A Guidance Manual for New Zealand Schools*.