



# Acknowledgements

The Wormery Challenge Lending Kit was developed by West Lothian Council Waste Services for schools and nurseries to learn about composting with worms. They will learn what can be composted and why composting is beneficial to the environment. Lesson 1 must be completed to ensure health and safety is addressed regardless of what other lessons are completed. However, teachers are welcome to choose which further lessons they wish to complete depending on pupil age and time availability.

Younger pupils (Nursery and P1-P3) may only wish to quickly look at the worm house (Lesson 2) and handle the worms (Lesson 3). Older pupils (P4-P7) may wish to complete all lessons (Lessons 1-5) including the Worm Quiz, Worm Fact Cards and Worm Diet Cards.

## Contents

### Overview

### Links to Eco-Schools and Curriculum for Excellence

### Equipment

**Lesson 1** - Health and safety and worm handling rules (5 minutes)

**Lesson 2** - Worm House (10 mins)

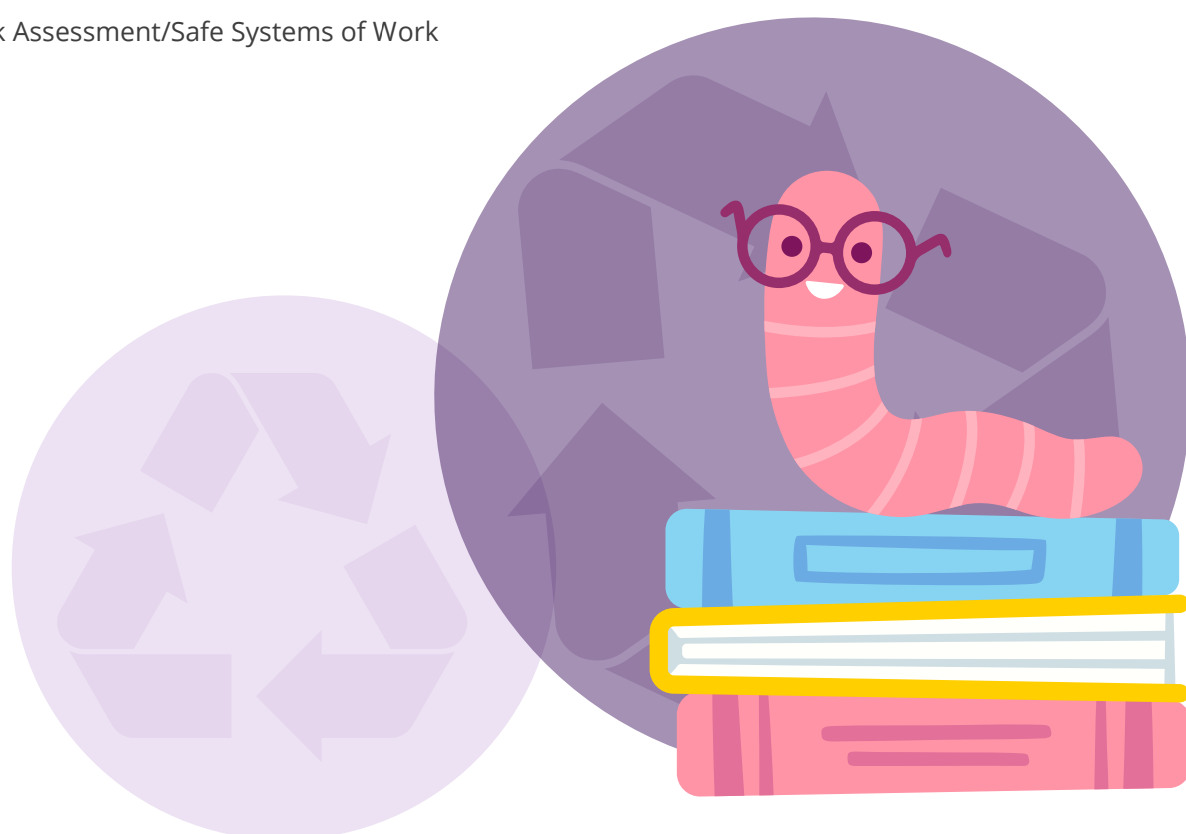
**Lesson 3** - Worm Handling (20 mins)

**Lesson 4** - Worm Diet (15 mins)

**Lesson 5** - Worm Fact Sheet (10 mins)

### Appendices

Task Based Risk Assessment/Safe Systems of Work



# Overview

## The Wormery Challenge Lending Kit comprises of:

- ▶ This teaching resource
- ▶ Worm House
- ▶ Worm Quiz
- ▶ Worm Quiz Answer Sheet
- ▶ Recycled pencils
- ▶ Rulers
- ▶ Worm Diet Cards
- ▶ Worm Fact Cards
- ▶ Blank Fact Sheets
- ▶ Tarpaulin to stand the wormery on to keep classroom clean
- ▶ Box of disposable gloves
- ▶ West Lothian Risk Assessment
- ▶ Safe System of Work

## By the end of the Wormery Challenge pupils should be able to:

- ▶ List the types of food waste and garden waste that worms can eat
- ▶ Describe the worm house and how it works
- ▶ Discuss worm facts
- ▶ Determine why composting with worms is good for the environment



## Links to Eco-Schools

ECO-SCHOOL TOPICS: WORMERY CHALLENGE			
Litter			
Waste Minimisation	Identification of food waste and garden waste types and volumes generated at home and school	Volume reduction of food waste and garden waste via compost	Environmental impacts of sending food waste and garden waste to landfill
School Grounds	Wormery Challenge photographs and displays	Worm Fact Cards and Worm Quiz display	Wormery Challenge Certificate
Biodiversity	Encouraging the breeding of different types of worms native to UK	Provide a food source for predators that feed on worms	
Energy	Energy and fuel used to transport food waste and garden waste to landfill	Energy and fuel used to recycle food waste and garden waste off site instead of at home or in school	
Water			
Sustaining Our World	Environmental impacts of sending food waste and garden waste to landfill	Reducing the need for artificial fertilisers	

## Equipment

There is enough equipment for a full class of 33 although it is advised that the class is divided into smaller groups for handling the worms and worm house.

- ▶ Worm House
- ▶ Worm Quiz (1 per pupil or group)
- ▶ Worm Quiz Answer Sheet (1 for teacher)
- ▶ Rulers (1 per pupil or group)
- ▶ Recycled pencils (1 per pupil or group)
- ▶ Worm Diet Cards (1 pack)
- ▶ Worm Diet Cards Answer Sheet (1 for teacher)
- ▶ Worm Fact Cards (1 set per class)
- ▶ Blank Fact Sheets (1 per pupil or group)
- ▶ Tarpaulin (1 to stand the wormery on to keep classroom clean)
- ▶ Box of disposable gloves (1 box)

## Lesson 1 Plan (5 minutes)

LEVEL: ALL AGES		LESSON FOCUS: HEALTH AND SAFETY	
<b>Learning Intensions:</b>		<b>Success Criteria:</b>	
We are discussing health and safety rules		I can describe what health and safety rules I must follow and why	
We are discussing how to care for the worms		I have learned how to care for the worms and handle them correctly	
<b>Suggested Resources:</b>			
Teacher's Notes			
School health and safety procedures			
West Lothian Council Risk Assessment and Safe Systems of Work (for reference only)			
<b>Activities:</b>			
Activity 1 – Health and safety talk (2 minutes)			
Activity 2 – How to handle worms talk (3 minutes)			

## Teacher's Notes

### Health and safety talk:

- 1) Teachers should read the West Lothian Council Risk Assessment and Safe System of Work (provided in the Wormery Challenge Lending Kit) before commencing the Wormery Challenge. This will identify some of the hazards involved in the activity and how to reduce the risks. These documents are for reference only and teachers should adhere to any school health and safety policies and procedures.
- 2) Teachers/Head Teachers should complete a risk assessment on behalf of the school and obtain any relevant permission.
- 3) Teacher should talk through the health and safety with the pupils before the Wormery Challenge. Talks should include:
  - ▶ No eating or drinking during Wormery Challenge
  - ▶ No consumption of the worm food or compost (especially important for nursery children)
  - ▶ Only use recycled pencils/rulers provided to prevent transfer of bacteria from hands to classroom pencils/rulers
  - ▶ No touching of face during Wormery Challenge
  - ▶ No running during Wormery Challenge
  - ▶ Hands must be thoroughly washed immediately after the Wormery Challenge

### **Safety message for pupils:**

The worm house contains lots of bugs and bacteria that we can't see with our eyes. They help the worms break down food so they are friends with the worms but they can give us tummy bugs and eye infections which no one wants! This is why it is important we don't use classroom pencils/rulers, touch our faces or put anything in our mouths until we wash our hands. Any tables used during the Wormery Challenge should be washed at the end of the session.

### **How to handle the worms talk:**

***Pupils should be reminded that worms are living creatures and can feel pain and fear. They should be handled with care to prevent stress, injury and death of the worms.***

#### **Do:**

- ▶ Provide disposable gloves to any pupil who has any skin irritations or broken skin
- ▶ Supervise pupils at all times during the Wormery Challenge
- ▶ Hold worms gently with both hands 'cupped' together
- ▶ Worms will sometime 'kick'. This is when the worm wriggles very quickly from side to side. It is a natural defence against predators which makes them more difficult to catch. This is harmless to the worms and pupils and is normal worm behaviour. If this happens, pupils should keep calm and close 'cupped' hands gently until the worm relaxes.
- ▶ Place worms gently onto table if measuring or observing
- ▶ Place worms gently back into the 'bedroom/living room (Level 3)' area of the worm house once pupils have finished handling them

#### **Do not:**

- ▶ Allow anyone with food allergies to handle the worms (a variety of food waste is fed to the worms)
- ▶ Run around with worms
- ▶ Throw worms at each other
- ▶ Shake worms
- ▶ Scream and make loud noises when handling worms
- ▶ Drop worms from a height e.g. onto floor
- ▶ Throw worms back into worm house
- ▶ Expose worms to extreme temperatures
- ▶ Allow worms to make contact with sharp surfaces or harmful substances e.g. paint, PVA glue
- ▶ Allow worms to dry out or be exposed to light for prolonged periods of time

#### **Please note:**

Worms can die within an hour if exposed to direct sunlight and their skin is very sensitive so it can dry quickly. It is recommended that worms are only handled for a maximum of 15 minutes before they are placed back in the worm house.

#### **Top Tip:**

***Some pupils have tried to take their new worm friend home with them so please check pockets!***

#### **Storage:**

While the wormery is being stored in school, please ensure it is in a sheltered area e.g. store room away from extreme temperatures. Please do not leave wormery outside during cold weather unless in a sheltered spot e.g. tool shed. Wormeries should not be left in green houses as temperatures become too hot. Wormeries should always be kept away from pupils and the lid must be kept closed (preferably weighted with brick etc) to prevent the worms from escaping.

## Lesson 2 plan – Worm House (10 minutes)

LEVEL: ALL AGES		LESSON FOCUS: WORM HOUSE	
<b>Learning Intensions:</b>		<b>Success Criteria:</b>	
We are discussing the environment in which worms like to live in the wild		I can describe what a worm environment looks like	
We are discussing how to keep worms at home or in school		I have learned how to care for worms at home or in school	
<b>Suggested Resources:</b>			
Teacher's Notes			
Worm House			
Worm Quiz (one per pupil or group)			
Worm Quiz Answer Sheet (for teacher)			
Recycled pencils (one per pupil or group)			
Tarpaulin			
Box of disposable gloves (for teacher)			
<b>Activities:</b>			
Activity 1 – Show pupils the different levels of the worm house			

## Teacher's Notes

If completing the quiz, the class can be divided into groups (3-4 pupils) who share a Worm Quiz and recycled pencil or each pupil can have their own Worm Quiz and recycled pencil and work as an individual.

**Explain to the pupils that a worm house is just like a human house with a:**

Roof (Level 1)  
 Kitchen (Level 2)  
 Bedroom/living room (Level 3)  
 Bathroom (Level 4)  
 Basement (Level 5)

**Ask the pupils why it is important to keep the worms in a worm house. Answers could include:**

To keep them cool in summer  
 Keep them warm in winter  
 Give them somewhere to eat and sleep  
 Stop the rain, snow and wind from getting in  
 Keep them safe from predators  
 Protect them from the sun light

Pupils might discuss that these are all the same reasons why people live in houses.

## THE ROOF (LEVEL 1)

This is a simple plastic roof to keep the wind, rain and sunlight out and stop predators from eating the worms. Lift the roof off and place upside down on the tarpaulin. Sometimes small, white baby worms will cling to the underside of the roof. Sometimes a cheeky slug or snail will be stuck to it too!

## THE KITCHEN (LEVEL 2)

This is where we place all the food for the worms. Worms can move between levels by squeezing through the small holes on the base of the levels. Tilt Level 1 so that pupils can see the holes. There are lots of small holes like a sieve. The holes also allow excess moisture to sink down through the levels to the bathroom. You might see some worms eating in this level.

Lift Level 2 off and place on the tarpaulin. Be careful not to squash any worms that might be underneath.

## THE BEDROOM/LIVINGROOM (LEVEL 3)

This is where the worms rest and sleep. Not many worms will be visible as they burrow into the compost. Ask pupils why this might be. Some answers include:

They might be scared of the noise in the class

They might be hiding from predators (birds and hedgehogs etc)

They might be keeping warm or cool depending on the weather

They might be trying to keep damp (worms don't like to be too dry)

They might be resting or sleeping

They might be hiding from the light (worms are sensitive to light = photosensitive)

There is no need to disturb the compost until pupils are ready to handle the worms but there are much more in there than it looks!

Lift Level 3 off and place on the tarpaulin. Be careful not to squash any worms that might be underneath.

## THE BATHROOM (LEVEL 4)

Worms don't need to take a shower, have a bath or brush their teeth but they have a bathroom which is just a big drain to let excess moisture away to stop them drowning. There is a tap on the front so the moisture can drain away. This moisture is liquid plant feed (like the small packet you get with cut flowers). It can be collected, diluted and fed to house plants. The tap must be kept closed the rest of the time to stop worms escaping! You might see the odd worm here. Sometimes they like to go here when it's too warm in the other levels.

Level 4 is attached to Level 5 so there is no need to lift it off.

## THE BASEMENT (LEVEL 5)

There is nothing in the basement (tap the basement to show it is hollow). The basement is just there to lift the worms off the ground so the worm house doesn't get too cold.



## Lesson 3 plan – Worm Handling (20 minutes)

LEVEL: ALL AGES		LESSON FOCUS: WORM HANDLING	
<b>Learning Intensions:</b> We are gently handling the worms to study them We are describing how the worms move We are describing the different parts of the worm’s body		<b>Success Criteria:</b> I can describe what a worm looks like I can describe how the worm moves I can identify the different parts of a worm’s body	
<b>Suggested Resources:</b> Teacher’s Notes Worm House Worm Quiz (one per pupil or group) Worm Quiz Answer Sheet (for teacher) Rulers (one per pupil or group) Recycled pencils (one per pupil or group) Worm Fact Cards (for teacher)			
<b>Activities:</b> Activity 1 – Pupils handle the worms to see how they move and study the worm body			

## Teacher's Notes

If completing the quiz, the class can be divided into groups (3-4 pupils) who share a Worm Quiz and recycled pencil/ruler or each pupil can have their own Worm Quiz and recycled pencil/ruler and work as an individual.

Ask the pupils if they would like to hold a worm. If they prefer not to then they can observe another pupil's worm. Those who would like to hold a worm should form a queue at the worm house. Pupils should be reminded about safe and gentle handling of the worms.

Wearing gloves, the teacher can gently dig the bedroom/living room (Level 3) so that the worms are turned towards the top of the compost. Pick one worm up at a time and place them in the 'cupped' hands of the pupils.

The teacher can use the Worm Fact Cards to read out worm facts while the pupils observe the worms. Remind them that they must listen to the worm facts so that they can answer the questions in their Worm Quiz.

One of the questions in the Worm Quiz asks the pupils to measure the worms. Worms should be placed gently on the rulers provided. You may wish to use only one classroom table to do this so that it can be cleaned at the end of the lesson. Alternatively, the table can be covered with newspaper to keep it clean.

It is recommended that the worms are only handled for a maximum of 15 minutes to avoid them drying out. Pupils should gently place the worms back into the bedroom/living room (Level 3) and the levels should be stacked again to seal the worm house closed.

Pupils should be given some time to finish their Worm Quiz before they are marked. The teacher can use the Worm Quiz Answers to allocate points.

Now that pupils have finished handling the worms, take this time to ask the pupils what they think liquid fertiliser and compost are actually made from. Let pupils know that liquid fertiliser is worm pee and compost is worm poo!

## Lesson 4 – Worm Diet (15 Minutes)

LEVEL: ALL AGES		LESSON FOCUS: WORM DIET	
<b>Learning Intensions:</b>		<b>Success Criteria:</b>	
We are discussing what worms can and cannot eat		I can discuss what worms eat	
We are sorting types of waste into two categories, 'Yummy, Yes Please' and 'Yuck, No Thanks'		I can discuss what waste we produce in school and at home that we could compost with worms	
We are discussing what waste we generate in school and at home that could be composted by the worms			
<b>Suggested Resources:</b>			
Teacher's Notes			
Worm Diet Cards			
Worm Diet Card Answer Sheet			
<b>Activities:</b>			
Activity 1 – Pupils sort through the Worm Diet Cards and split them between 'Yummy, Yes Please' and 'Yuck, No Thank You'			

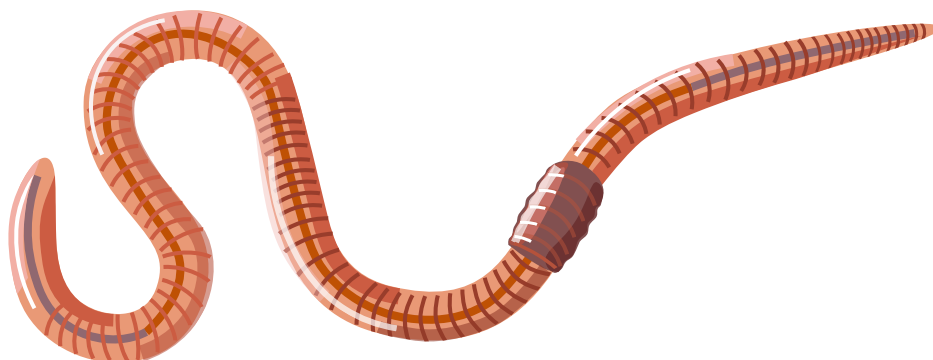
## Teacher's Notes

Place the 'Yummy, Yes Please' and 'Yuck, No Thank You' cards at each end of a table.

Sort through the Worm Diet Cards and discuss which waste types the worms would like to eat and which could be harmful to worms. Waste types that have an asterisk can be fed to worms but only in small amounts.

Use the Worm Diet Card Answer Sheet to rearrange the Worm Diet Cards into the correct categories. Keep the correct Worm Diet Cards in one pile to be used in Lesson 5 – Worm Fact Sheet.

Discuss with pupils what types of waste they produce at school and at home and if the waste could be composted by worms.



## Lesson 5 plan – Worm Fact Sheet (10 minutes)

LEVEL: ALL AGES		LESSON FOCUS: WORM FACT SHEET	
<b>Learning Intensions:</b>  We are discussing what we have learned about worms, their environment and their diet  We are discussing what waste we generate in school and at home that could be composted by the worms  We are discussing why composting with worms is good for the environment		<b>Success Criteria:</b>  I can describe what worms look like and how they function  I can discuss what waste we produce in school and at home that we could compost with worms  I can discuss why composting with worms is good for the environment	
<b>Suggested Resources:</b>  Teacher's Notes  Worm Fact Cards  Correctly sorted Worm Diet Cards  Blank Worm Fact Sheet (one per pupil or group)  Recycled pencils (one per pupil or group)			
<b>Activities:</b>  Activity 1 – Pupils to fill in the blank Worm Fact Sheet with worm facts that they have learned.			

## Teacher's Notes

Pupils can complete the Worm Fact Sheet either individually or in small groups (3-4 pupils).

Pupils will write down some facts that they have learned about the worms, their environment, their diet and how composting food waste and garden waste with worms is good for the environment.

Once all the lessons have been completed and the Wormery Challenge Lending Kit has been returned to West Lothian Waste Services, a personalised certificate of achievement will be posted to the school.

**Pupils should now wash their hands.**

**Waste Strategy Team by emailing:**  
**[wasteaware.council@westlothian.gov.uk](mailto:wasteaware.council@westlothian.gov.uk)**

**[www.westlothian.gov.uk/  
article/4890/Waste-Education](http://www.westlothian.gov.uk/article/4890/Waste-Education)**