



# Science

## Rocks

The image is a vertical cross-section of soil layers. At the top, there are brown, branching tree roots extending downwards. Below the roots is a layer of dark brown soil. The middle section is a thick, light brown layer. The bottom section is a yellowish layer. Scattered throughout the soil layers are several grey, teardrop-shaped rocks of varying sizes. The title 'Soil Formation' is centered in the light brown layer.

# Soil Formation

twinkl

# Aim

- I can explain how soil is formed.

# Success Criteria

- I can state that soil is composed of different things.
- I can describe the 4 processes of soil formation.

# Soil



What is soil?

What is soil made from?



# What Is Soil Made Of?

Soil is the uppermost layer of the Earth. It is a mixture of different things.

## Air

Soil contains gases such as carbon dioxide, oxygen, nitrogen, methane and radon.

## Water

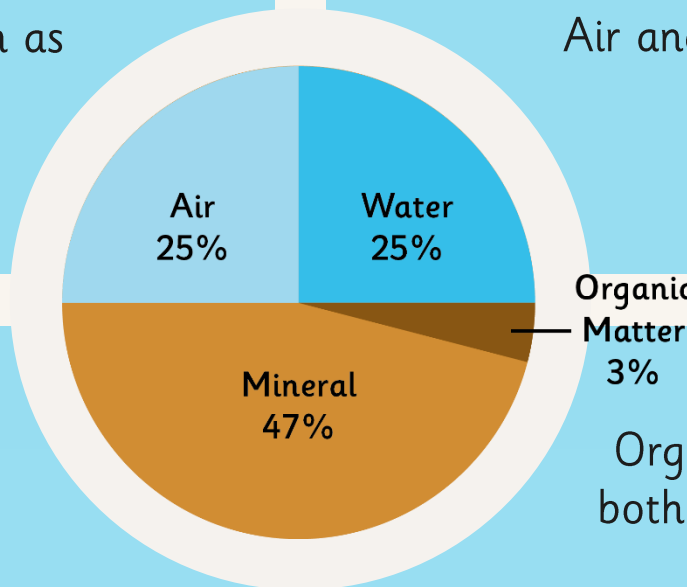
Air and water fill the gaps between particles of soil.

## Mineral

The minerals in soil come from finely broken down rock.

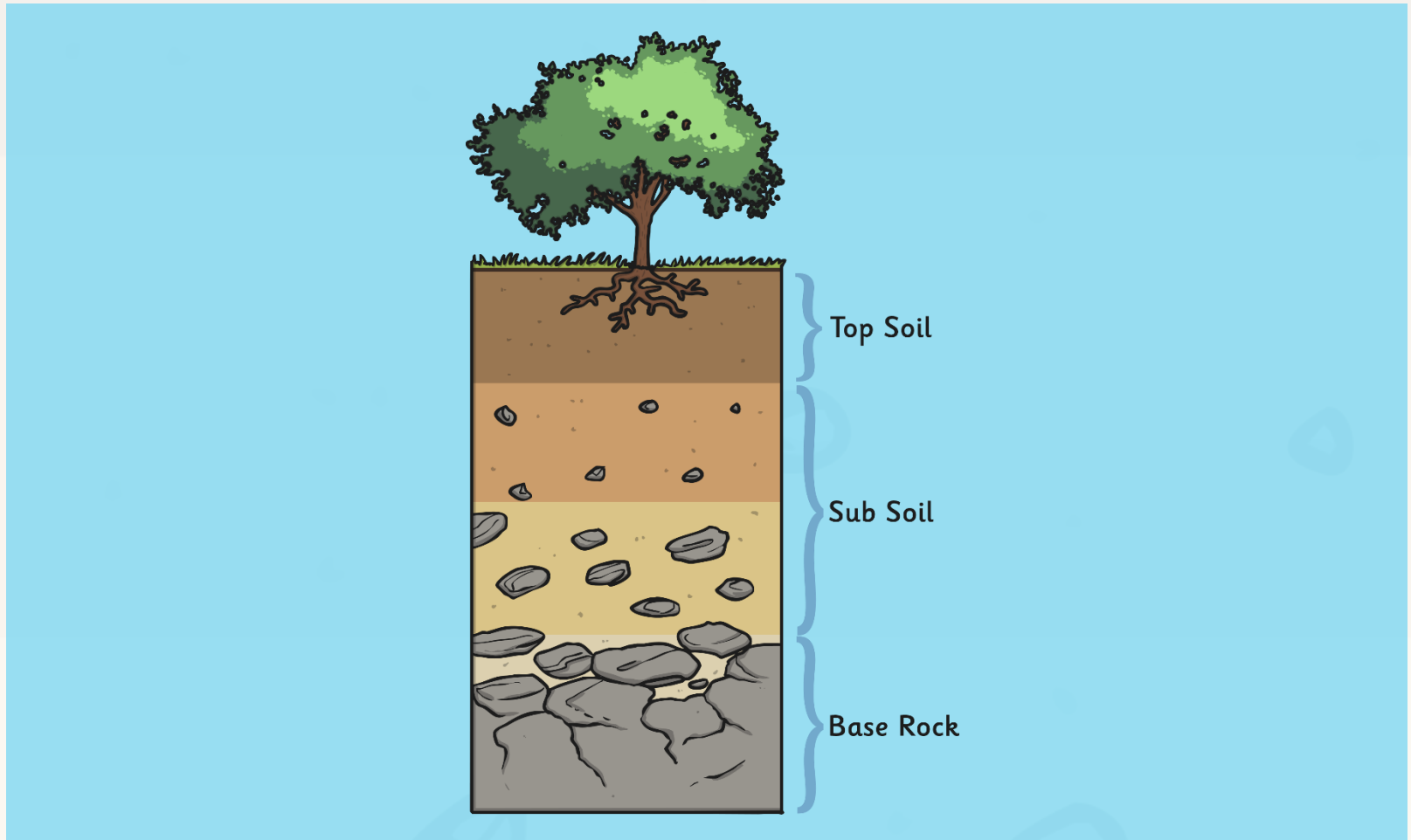
## Organic Matter

Organic matter includes both living and decaying animals and plants.





# Layers of Soil



# Soil Formation

There are 4 main processes involved in soil formation:

## Additions



## Losses



## Translocations



## Transformations



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# Soil Formation

## Additions

**Rainfall** adds water.

**Dust** adds minerals.

**Animal waste** adds organic matter and nutrients.

**Decaying plants and animals** add organic matter.

**Humans** add fertiliser. Fertilisers contain minerals and nutrients. Natural fertilisers are made from animal waste and organic matter. Human-made fertilisers are made from chemicals.

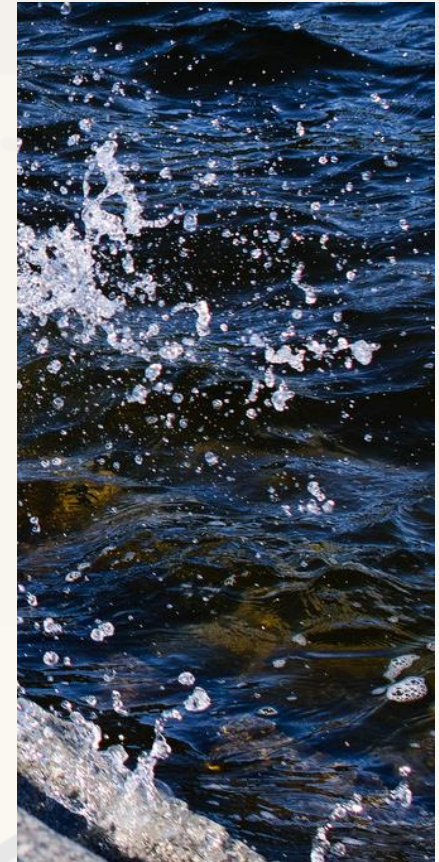


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# Soil Formation Losses

**Water** evaporates (turns into gas when hot) into the air.

**Soil particles** can wash away in storms.

**Organic matter** can turn into the gas carbon dioxide.

**Nutrients and Minerals** are taken up by plants and can drain into groundwater.



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# Soil Formation

## Translocations

**Translocations** are movements within the soil.

**Gravity** pulls water down from top to bottom.

**Evaporating water** draws the minerals up from the bottom to the top.

**Animals** living in the soil move the soil around in every direction.

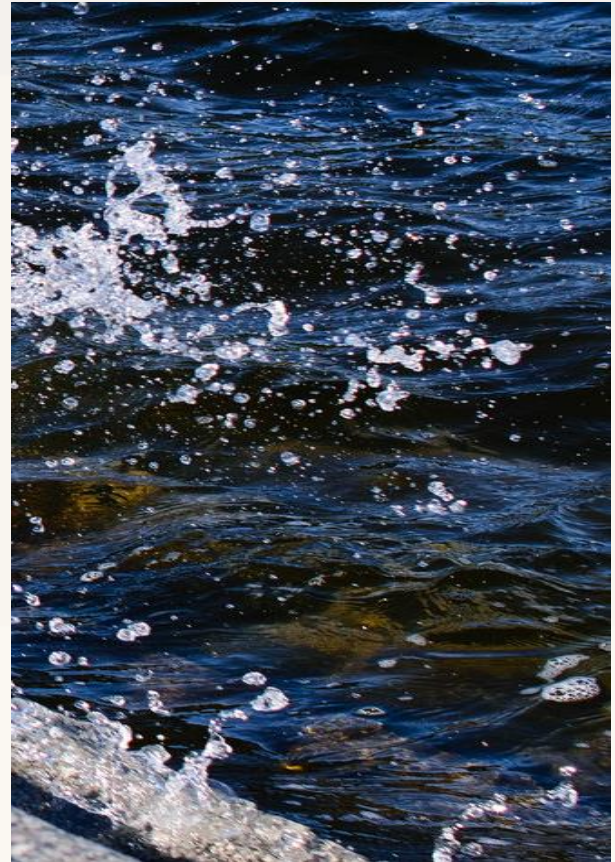


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# Soil Formation Transformations

**Transformations** occur when something changes into something else.

**Humus** is what is left when dead leaves decompose.

**Weathering** causes hard rock to erode and turn into smaller and smaller pieces of rock.

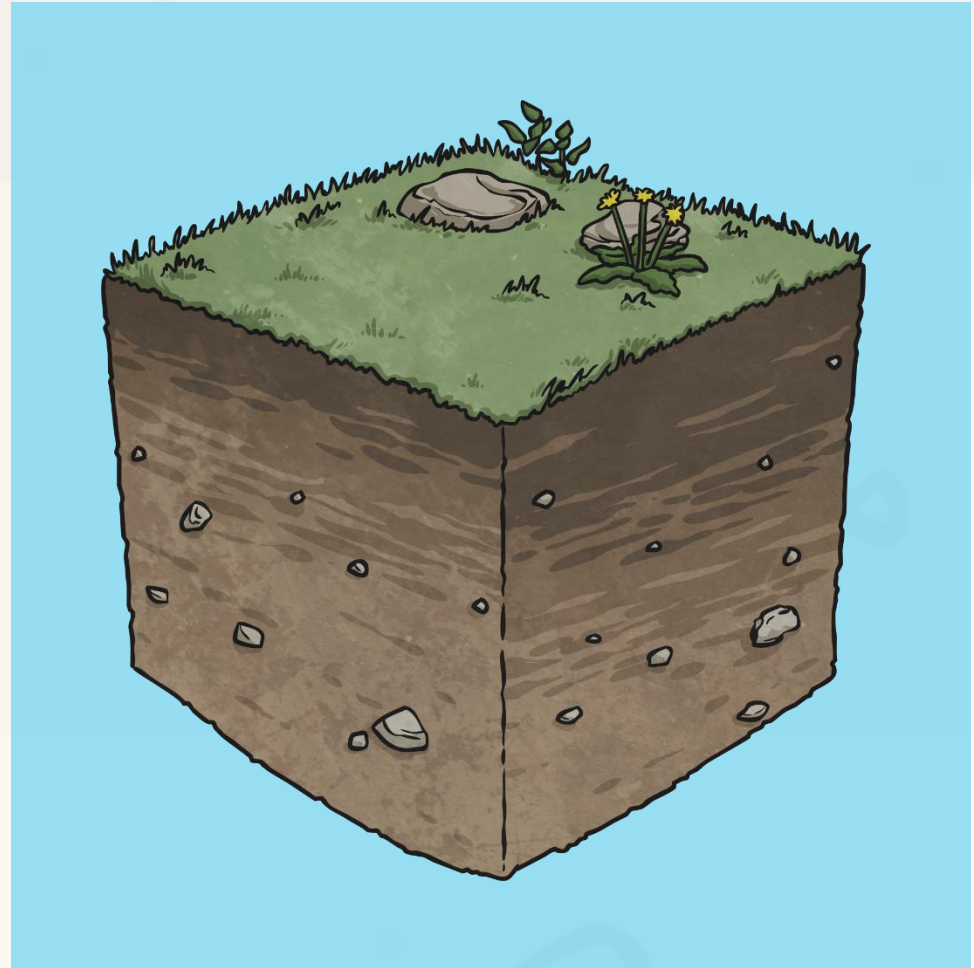
Oxygen **reacts** with the minerals such as iron which can make the soil look a reddish, 'rusty' colour.



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# Soil Formation

All four processes are taking place at the same time all the time!





# Compost

Compost is organic matter that has been decomposed so that it can be recycled as natural fertiliser.

Many people choose to have a compost bin at home as they see it as more environmentally friendly to recycle waste food rather than throw it away.

It also means they can create their own fertiliser for soil in their garden or for plants, rather than buying it. You will now have a go at creating your own mini compost bin complete with worms!



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# Creating Compost

## Health and Safety

Make sure you handle all waste materials with **plastic gloves** as all food waste contains **bacteria** that could make you feel ill.

Just because **worms** don't cry or scream when they are in **pain** does not mean they don't feel it. Handle them gently and carefully.

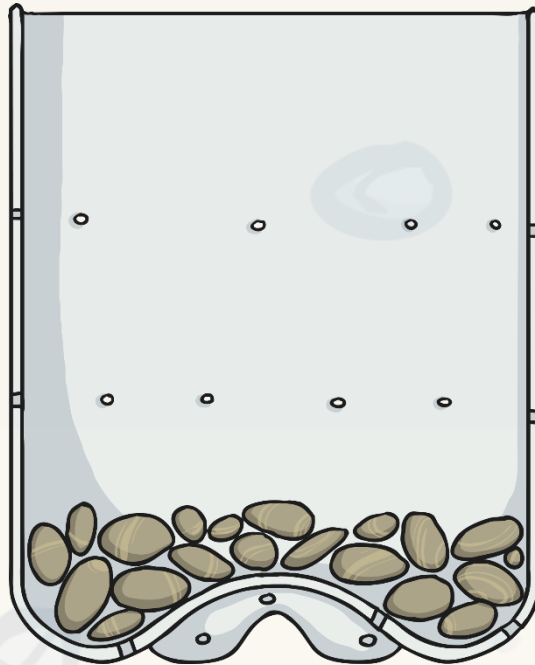
A **health and safety monitor** in each group will check that everyone is following the rules properly.

# Creating Compost

## Step 1



Place small stones as the first layer.

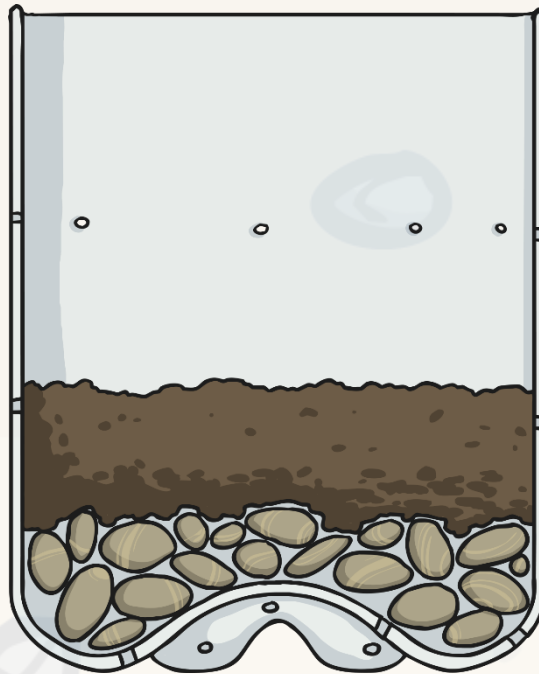


# Creating Compost

## Step 2



Add a layer of compost.



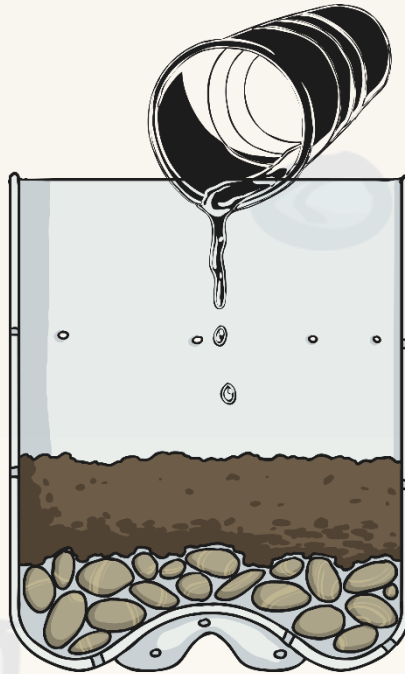


# Creating Compost

## Step 3



Add a small amount of water so that the compost is moist but not completely wet.

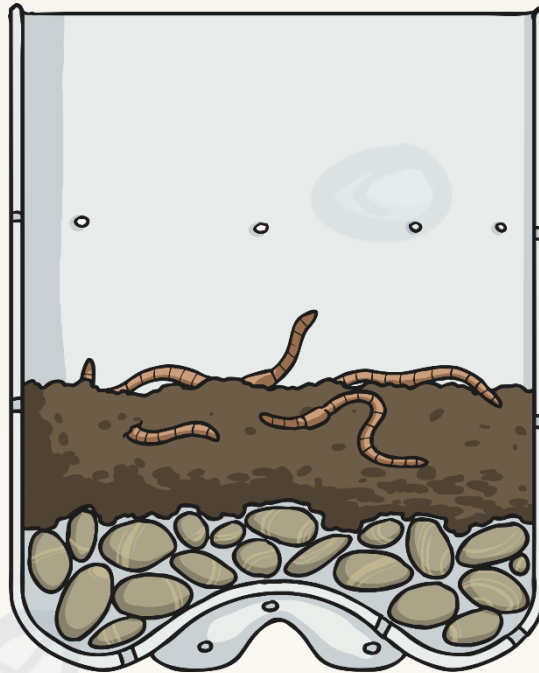


# Creating Compost

## Step 4



Wear plastic gloves to handle the worms. Ensure that worms are handled gently. Place a few worms gently onto the compost.

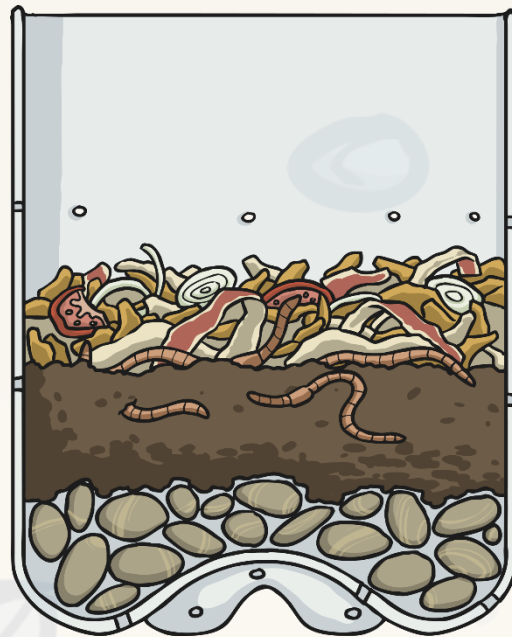


# Creating Compost

## Step 5



Wear plastic gloves while adding waste food. Place a handful of scraps on top of the worms. Leave it placed gently on the worms; it will fall further by itself so there is no need to push it down.



# Creating Compost

## Step 6



Wet the shredded paper and add it as the topmost layer of your mini compost bin.



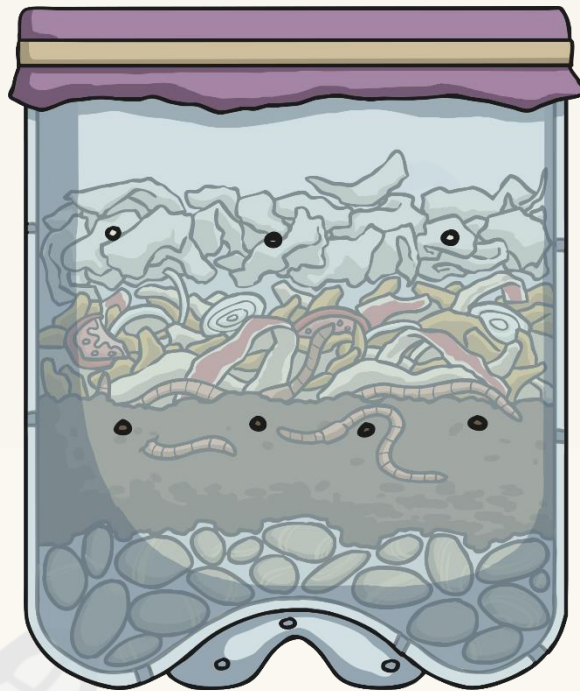


# Creating Compost

## Step 7



Add a thin piece of fabric over the top of the plastic bottle and secure it with an elastic band.

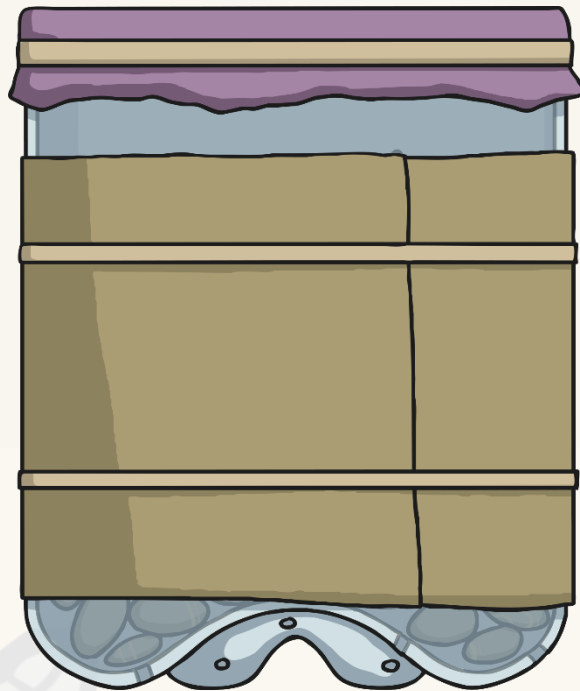


# Creating Compost

## Step 8



Attach long rectangular pieces of card around the bottle so that it makes it dark for the worms. They live in the dark and do not like bright lights.



# Creating Compost



Now you will be creating your own mini compost bin!

Make sure to follow each step on your **Creating a Mini Compost Bin Instruction Sheet** carefully.

### Creating a Mini Compost Bin

Follow each step of the instructions carefully to create your mini compost bin.

Step	Instruction	Diagram
Step 1	Place 3 small stones as the first layer.	
Step 2	Add a layer of compost.	
Step 3	Add a small amount of water so that the compost is moist but not completely wet.	
Step 4	<b>Health and Safety:</b> Wear plastic gloves to handle the worms. Ensure that worms are handled gently. Place a few worms gently onto the compost.	
Step 5	<b>Health and Safety:</b> Wear plastic gloves while adding waste food. Place a handful of scraps on top of the worms. Layer a plastic bag on the worms. It will fall further by itself so there is no need to push it down.	

Use shredded paper and add as the topmost layer of your compost bin.

Put a piece of fabric over the top of the plastic bottle and fix with an elastic band.

Use long, rectangular pieces of card around the bottle so that it is dark for the worms. They live in the dark and do not like light.

# Caring for Worms



How will you care for the worms?

- Keep the mini compost bins in a quiet place.
- Keep the mini compost bins away from the sunlight and keep the cardboard pieces in place.
- Do not place anything on top of the compost bins so that enough air gets through.
- Every other day, check that the top layers of compost are damp. The worms need moist skin to breathe.
- Add only small amounts of food once the first scraps have been eaten.
- After a few weeks, return the worms to a compost bin or heap as they may not survive in the soil straight away.





# Aim



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