



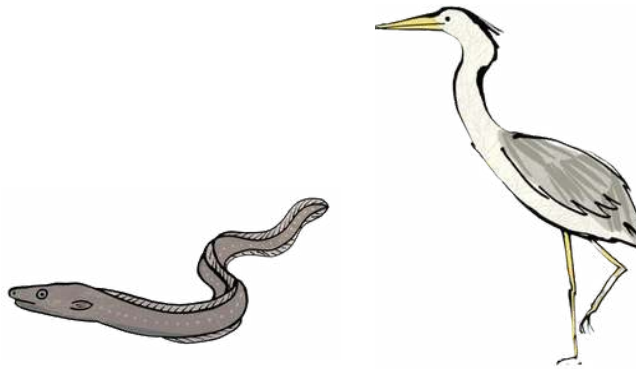
Educational Activities

Fun activities to do at home or at school to learn about rivers and related issues.

These sets of activities were first developed as part of our Home Education programme launched during the first Covid 19 lockdown.

Each set includes a series of six activities around a different theme. Four themes are covered altogether. They include:

1. River Wildlife
2. River Features
3. Saving Water
4. Rainwater



Activities have been designed by a qualified teacher, include a learning objective and are curriculum-linked. They are aimed at 7-9 year-olds with a 'Support' idea for younger children and a 'Challenge' suggestion for older children. A grey heron will direct you to these on each instruction sheet!

Before you begin

Why not create a River Journal?

Great for keeping all your work in one place!

For instructions for making one click [here](#).

Make sure you give yours a river theme.

Additional pages can be used for river sketching, recording river finds, poems, stories or other river related activities.



We also run river education sessions as part of Project Kingfisher and have a range of fun activities for children and families to do on their visit to a river on our Junior River Ranger pages. Go to our website to find out more.

Project Kingfisher: Rainwater Activities

1. Rainwater and Animals



Learning Objective: To discover how water is used by common mini-beasts

All animals - no matter what their size - need water to survive. Even small amounts of water found around the garden are incredibly useful for the creatures that live there. Have a look at the water facts below and try to guess which animal each one matches up with. Then, follow the squiggles to see if you got them all correct!

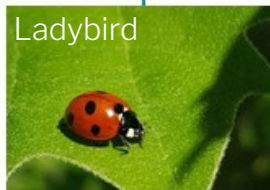
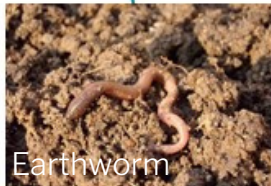
Drinks from droplets of water it catches on silk threads

Doesn't drink but instead gets the water it needs by eating damp soil

Uses its bottom for drinking and gets rid of waste as a vapour through its shell

Keeps its hive cool by collecting water and spitting it out when it gets home

This spotted insect drinks from droplets of water found on leaves



As well as drinking, this arachnid gets water by eating its dew-covered web

Drinks just 2-3 droplets of water per day

Extends its tongue to mop up water from ponds, puddles or anywhere it can find it

It breathes through its skin getting oxygen from the moisture around it

This crustacean breathes through gills that must be kept moist



Why not head out to your garden or local green space to see how many of these creatures you can spot? Here are some clues so you know where to look. Record in the box how many of each animal you found.

Woodlice

Woodlice like dark places. They are great at hiding - cramming themselves into tiny cracks and holes. Under a brick or log is a great place to look. They are called woodlice for a reason - they feed on rotting wood or other plant material. A log pile is one of their favourite places!



Earthworm

Earthworms feed on rotting plant matter in the soil - like dead leaves. Try looking under a pile of dead leaves or in a compost bin. They come to the surface when it rains. Try faking a rainstorm by stamping on the ground and see if they pop up.



Garden Spider

Garden spiders make large webs to catch their prey. They find trees and shrubs really useful spots for making their webs. They can usually be seen in gardens from early June. If you go out first thing in the morning, you may be able to see a beautiful dew-covered web.



Honey Bee

Honey bees can often be found around wildflowers. If you can, find a patch of wildflowers and sit quietly for a minute or two to see how many you can spot.



Ladybird

Ladybirds can be found on leafy plants hunting for tiny insects called aphids. Aphids group in large clusters on new leaves and flowerbuds. Find the aphids and ladybirds may be nearby!





Learning Objective: To observe how water is transported to all the parts of a plant

Introduction

Water is essential for plants. Plants use their roots to suck up water from the soil. The water carries nutrients (food) to all the parts of the plant. Even without the roots, plants are still able to suck up water to stop its leaves from wilting and flowers from drooping. Complete this experiment to find evidence of how water travels through plants.



Things you will need:

This experiment aims to make use of things you have in and around your house, providing options in case you have trouble finding something:

- Food colouring - if you haven't got any, take the cartridge from an old felt tip pen
- Something to use as a small vase: a jar, cup or glass
- Scissors
- A plant cutting - a celery stalk, a lettuce leaf, a cut rose, a small cutting from the garden

Instructions

1. Prepare the vase

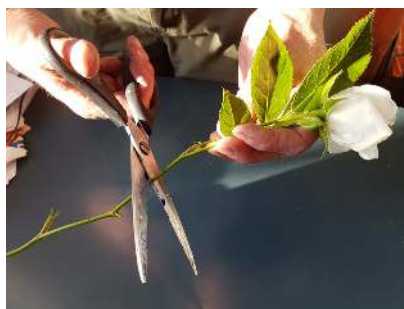
Put a couple of centimetres of water into your vase. Add several drops of food colouring OR drop in the felt tip cartridge (cutting it in pieces works well but can be messy).

Food colouring Felt tip cartridge



2. Prepare the plant

Cut the stem of the plant with sharp scissors so it has a fresh, clean cut. Make sure the stem is long enough to reach the water and the vase is tall enough to support your cutting.



3. Conduct the test

Place the cutting into the vase and leave for several hours. Different plants take up water at different rates so keep checking it carefully for signs that the coloured water has travelled through the plant.



Top tip: It may not work with all cuttings and sometimes the evidence can be hard to spot. Hold your cutting up to a window. Light shining through the leaf can make it easier to see.



Experiment

Try different kinds of leaves and flowers or try adding different colours to the water. Some will work better than others. Here are some that seemed to work quite well.

Lettuce in red water

You can see the path the coloured water took as it travelled through the leaves.



Leaves from a garden shrub in red water

The veins of the leaf have been dyed red.



A plain white rose before it was dyed.



A white rose in red water

Can you see how it travelled through the petals?



A white rose in blue water

Blue shows up more at the flower edges.





3. Rainwater and the landscape

Learning Objective: To create a garden that captures rainwater so it can be used by plants and animals

Resources

- **Plastic trays** that are a few centimetres deep. A seed tray is best (large, if they are going to work in groups or small, for individuals/pairs) or ask children to bring in plastic trays such as : a take away tub or tray from fruit or veg)
- **Some soil or compost** - use a mix of both if you can
- **Scissors**
- **Water bottles**
- **A sample garden and a polystyrene tray (like a pizza tray) that can cover it**
- **Optional extras:** small toy animals and accessories, plasticine, pipe cleaners, a milk bottle lid to make a pond, a block to make a bench, any other ideas?

Introduction

Ask children to name some plants and animals that they might see in their garden or a local park. How might these plants and animals use rainwater? Why is water important to them? Worms live in damp soil. Insects drink from tiny droplets of rain. Birds have a wash and a drink in small puddles or ponds. Trees suck up the rainwater from the soil. Without water plants wither and die. In this lesson, we are going to test different landscapes to see what happens to rainwater in each one.

Activity

Children will use natural materials found outside to create their own mini-garden for wildlife. It is best to carry out this activity outside either in the playground or a local green space.

1. Gather materials

As a class, head outside with scissors and something to gather some materials in. See suggestions of things to collect.

Encourage children to gather things that have fallen to the ground, but scissors can be used to carefully cut small bits from plants. Warn them to watch out for thorns and only cut what they need!

Things to collect:

- Twigs with leaves to use as trees or shrubs
- Flower petals to make a wildflower meadow
- Sticks to use as logs
- Grass clippings, moss, gravel, leaves, stones



2. Add the compost / soil

If using both soil and compost, children should add a few handfuls of each and mix it together in the tray. Make sure they completely cover the bottom of the tray with at least 2 cm whatever you are using.

3. Rainwater and the landscape



3. Create the garden

Start landscaping. Children to add features for mini-beasts and other animals (see the list below) and some extra things they can think of - a path, a pond, a bench.



Features to add:

- Wildflowers for bees
- Leafy plants for ladybirds
- A log pile for woodlice
- Trees for squirrels and birds
- A leaf pile for earthworms
- A pond for frogs

The garden could be neat and organised or messy and wild.

4. Bring the garden to life

What creatures would like to make your garden their home? Worms? Bees? Squirrels? Birds? People? Add in some extras to bring your garden to life. You could use small toys or make some creatures out of plasticine or pipe cleaners.



5. Rain on your garden

When the gardens are complete, its time to add some rain to see what happens to it. Using a water bottle children can sprinkle a small amount of water on their garden.

Children to discuss: What happened to the water? Where does it soak in? Where does it pool? Can you find any droplets of water left behind?

Ask some children to show and tell their garden and share the results. Ask them the questions above and for each one ask: why would that be useful - what wildlife might use that water?



Plenary

Using a sample garden, rip out the trees and cover the whole thing with the polystyrene tray explaining that this is what has happened to much of our natural landscape - it has been paved over and built upon. (You could add mini-lego houses for impact). What is going to happen to rainwater now? Demonstrate. In real life where would this water end up? What would happen if too much water rushed to the drains all at once?

Which landscape is better for wildlife? Which landscape is more likely to flood?

4. Rainwater and Flooding



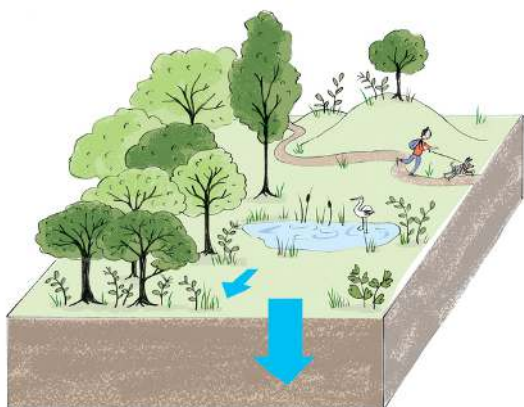
Learning Objective: To discover how different types of flooding can happen

Recap – What have we learned so far?

1. Water in the landscape is useful for animals
2. Water in the landscape is useful for plants
3. Green spaces like gardens help capture water and store it so it can be used by plants and animals



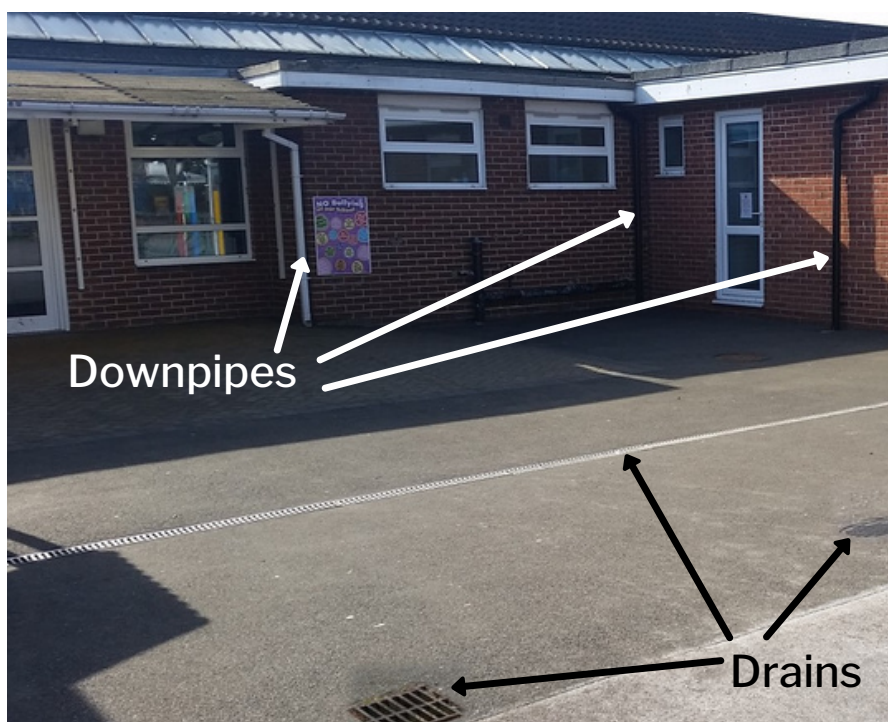
What happens to rainwater when we build over our green spaces?



In a green space most rainwater soaks into the ground.



In built up areas the water can't soak in. It becomes runoff.



All the rainwater that lands on **roofs**, runs off into **downpipes** and into underground pipes called the sewer.

The rain that lands on **paved surfaces** runs into **drains** and into the sewer.

As more buildings are constructed, more roads and car parks are built, more rainwater becomes runoff - it goes straight into the sewer.

What a waste!



Introduction

As more green space is built over, more runoff enters our sewers. This can cause two types of flooding. **River flooding** occurs when a river bursts its banks. **Surface water flooding** occurs when the sewer becomes overwhelmed. In this activity, you will have a go at causing both types of flooding.



You will need:

- A funnel - or make your own using the instructions below
- A cup
- A jug or bottle

To make a funnel

Use a sandwich bag or plastic wallet.

Cut out a large triangle that includes the bottom corner.



Snip off the very tip of the corner to make a **tiny** hole.



Feed the triangle into a toilet tube. Secure it with a rubber band.



TASK 1 - River Flooding

Fill the water bottle or jug. Pour this runoff into the funnel (sewer) so it drains into the cup (the river). The aim is to fill the cup and make it overflow without letting any of the water spill over the top of the funnel.

TASK 2 - Surface Water Flooding

Empty the cup and repeat Task 1, only this time see if you can overwhelm the sewer. Pour the water so that it fills the funnel and spills out over the top.



Carry this out over a sink or outdoors

Which type of flooding was easier to cause? Complete these statements with a type of flooding:

When too much rainwater rushes to the drains all at once it causes _____

When runoff continues to enter the river for a long time it causes _____

In real life, both types of flooding can happen at once. How could we reduce the amount of runoff entering the sewer so that there is less risk of flooding? Complete the next activity to find out!



5. SuDS not Floods

Learning Objective: To design a feature that will capture rainwater to prevent flooding

Introduction

In a built-up area (an urban landscape), a lot of rainwater rushes to the drains because it can't soak into the ground - it is impermeable. So what features can we add to these areas to help capture rainwater? **SuDS** - which stands for **sustainable drainage systems**.

SuDS direct water from the roof or from paved surfaces to areas where it can soak in. So, for example, a downpipe that takes water from the roof might feed into a garden instead of the drains. This is called a rain garden. Below are some more examples of **SuDS**. Have a go at identifying each one. Draw lines to match the illustration to the name and photograph of each feature. One has been done for you.



Permeable Paving

Green Roof

Rain Garden Box Planter

Water Butt

Tree Pit

Rain Garden



5. SuDS not Floods

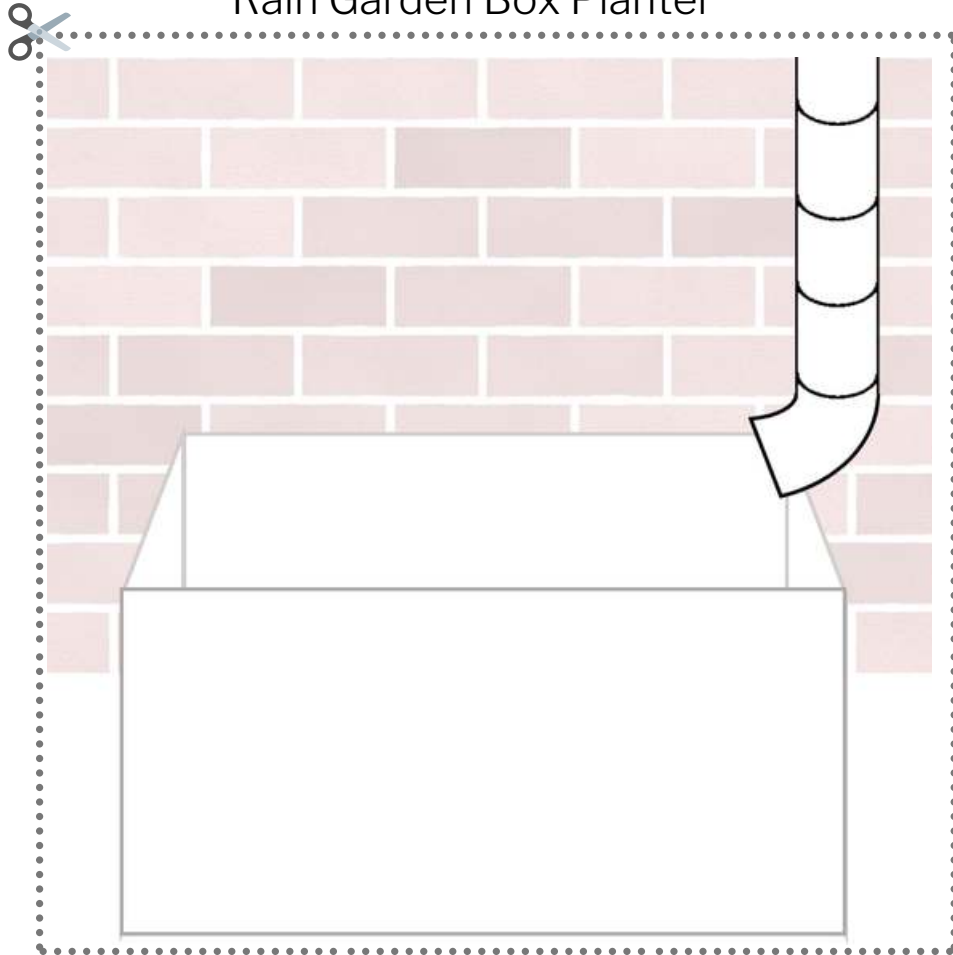


SuDS don't have to be boring. There are all sorts of ways you can make them more interesting and fun: add balance beams or stepping stones to a rain garden; make the downpipe rain into the box planter. You can add practical things like a seat. You could include colourful flowers, plants that smell or feel nice or ones you could eat. You could add wildlife features like a mini-beast log pile or a bug hotel. What would you include?

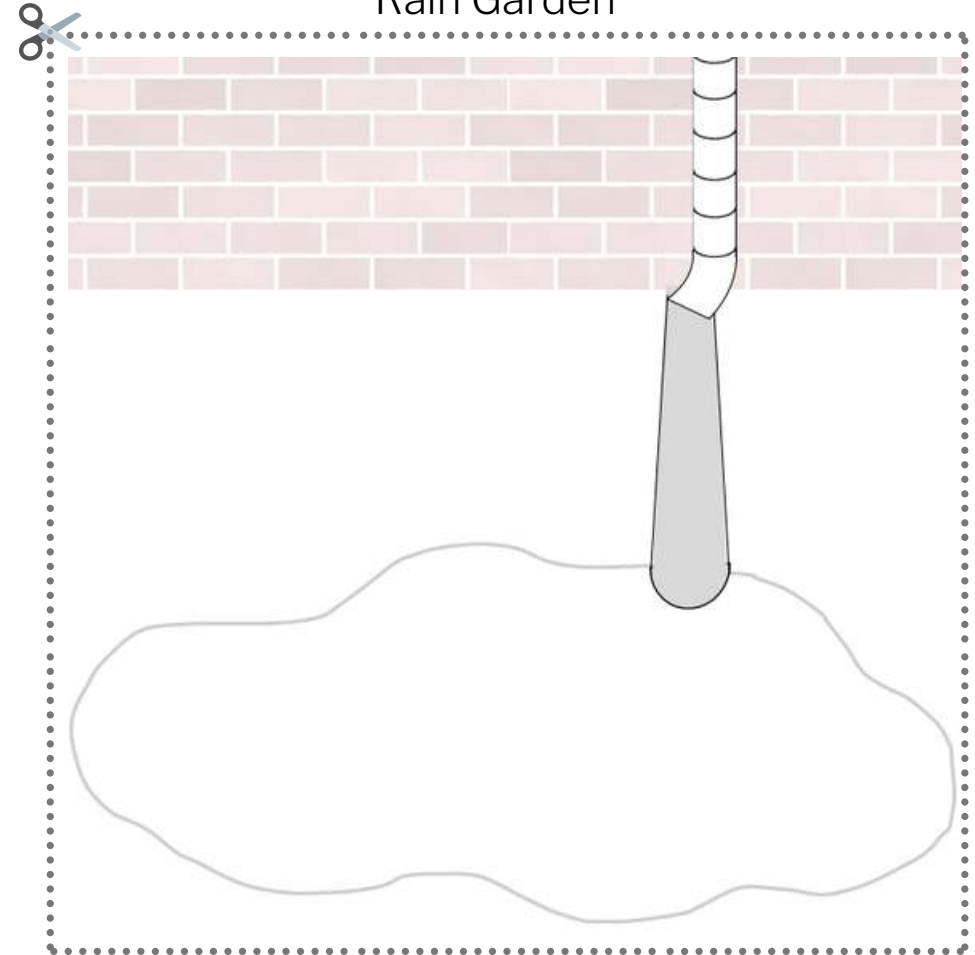
Task

Either cut out one of the templates below, stick it in the middle of a blank page and then turn it into something amazing or, draw your own. You can choose any of the SuDS featured on the previous page. Check out this website for ideas: www.wendyallendesigns.co.uk/

Rain Garden Box Planter



Rain Garden





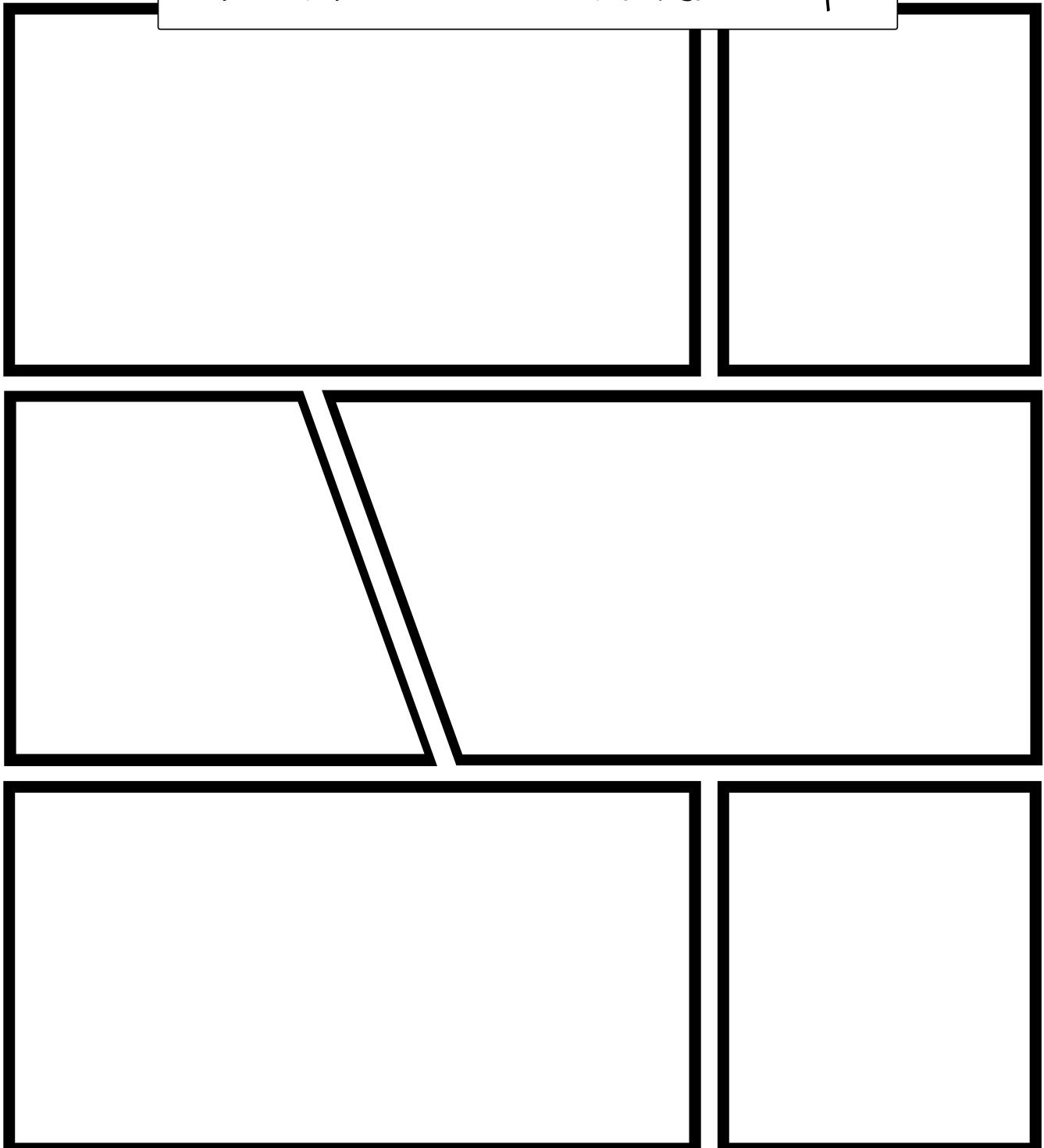
6. Rainwater Comic Strip

Learning Objective: To create a comic strip to show what can happen to rain when it falls

A comic strip is a series of images that tell a story using pictures, captions and speech bubbles. Use the boxes below (or create your own) to draw a comic strip of 'The Adventures of a Raindrop'.

Use what you have learned about what happens to rainwater in a green landscape (how plants and animals use it) and an urban landscape (built up area). You decide on the adventure your raindrop will have. Start with it falling from a cloud. What happens next?

The Adventures of a Raindrop



The comic strip template consists of six panels arranged in three rows. The top row has two panels. The middle row has a large panel on the right and a smaller panel on the left with a diagonal line. The bottom row has two panels.

Need inspiration? Watch this [film](#)