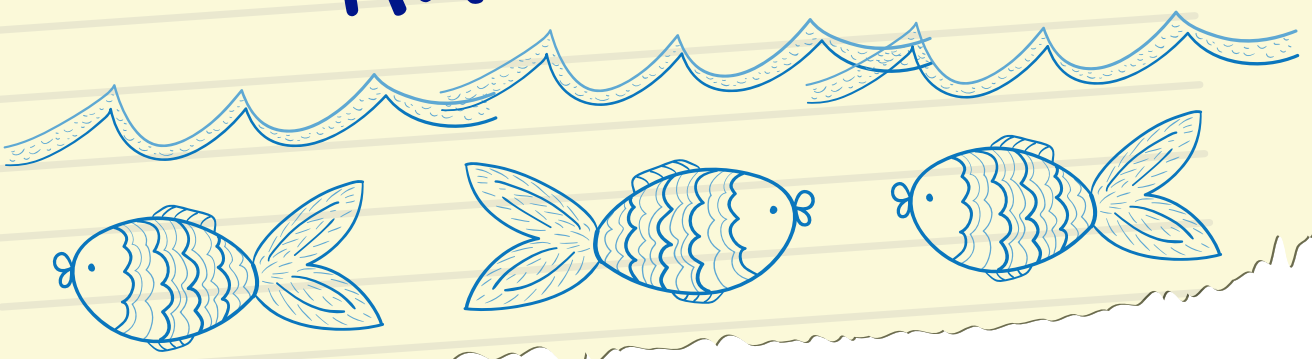
River Life



Explore the range of water habitats within the parks to observe and study the different habitats, ecosystems and food chains found in various locations.

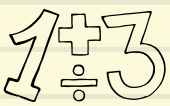
NB. The river course is unusual, running through a chalk landscape, which affects its ecosystems.

Suitable for KS2, adaptable for KS1

Curriculum areas covered:

Geography
Environments
Rivers
Water cycles

Science
Scientific methods & processes
Habitats
Ecosystems
Food chains
Fresh water-life



Mathematics
Lists and ordering systems

English
Evaluation discussions
Composition
Poetry

Art & Design
Observational drawing

History
Continuity and change

Citizenship
Responsible behaviour

Design & Technology
Exploring Google technology

Physical Education
Outdoor exercise

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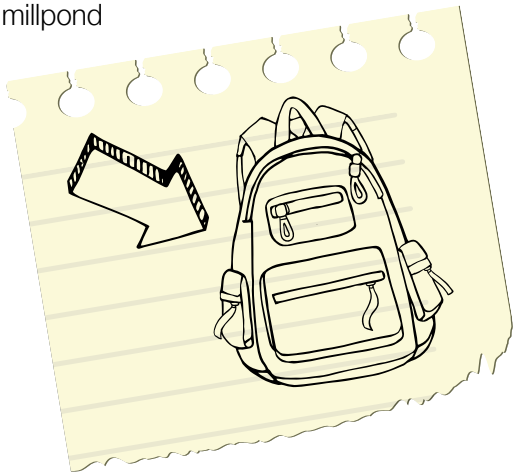
River Life

Before your visit:

- Consider what humans need for their basic survival. Discuss and compare the differences in how and where we would have survived best 1000 years ago, 100 years ago, and now. Consider how our access to water has changed in this time – from living close to water, to the construction of reservoirs, to bottled water.

Where to go:

- Collect the **PUPILS' GREY and BLUE** and **TEACHER'S BLACK RESOURCE RUCKSACKS.** Follow the watercourses through the parks, from the feeders to the lake and culverts to the river at the eastern end. To add a history dimension in understanding the water channels feeding the millpond and former water mill at the eastern end of the site, see **Paper resources sheet 3.**



During the visit:

- As a class or in adult-led groups, explore the water edges, paying particular attention to what is around you, noticing the variety of water-based **habitats** as the character of the river and its surroundings change. Look both high and low for evidence of wildlife, birdlife, river life and plants.
- Focusing on three contrasting water habitats, describe their characteristics.
- Observe and list the range of plants, insects, fish, mammals (including humans?) and birds evident in making up each ecosystem. Are there any noticeable variations?

  NB. Use nets and magnifying glasses to explore the water life. Use binoculars to explore the water banks.
- Use the **Name that Mini Beast resource sheet** and the **Collins Complete Guide to British Wildlife book** to identify the more unusual life forms found in and around the river.
- In each ecosystem try to work out what each type of living organism feeds on to survive. These can be categorised as **Producers, Consumers** and **Predators.**
- Tabulate all of the information as the layers of data build up.
- Create a **food chain diagram**, with thumb nail **observational drawings,** linking the living organisms together, and based on a hierarchy of who eats whom. What would happen to the ecosystem and habitat if the river became slightly polluted and just the water plants died? Likewise, what would happen if the river got polluted and just the water insects died?
- Take pupils to the icehouse (see **Sketch plan resource sheet** for location). Explain that an icehouse was used to store ice for drinks in the days before refrigeration (see **Time trail detectives resource sheet 2** for more information). Ask them to stand beside the stream below the icehouse and listen to the gurgling of the water flowing under the culvert. Ask pupils to look at different states of water in the park and to make a list of metaphors or similes for water that they can later combine to form a poem, e.g. 'Water is the tears of God/water is as clear as glass/water gurgles like a hungry stomach/ water is like a worm slipping between your fingers'.

After the visit:

- Using the Internet and Google satellite images, track the course of the river in both directions from the Kearsney parks, finding its source(s) and its end.
- Where does the water come from before its visible start, and if the river is constantly flowing into the ocean, why hasn't the sea level constantly risen and flooded the land? Work out the water cycle that is happening over time that brings about this equilibrium.
- Remind pupils of the initial discussion about the necessity of water to human survival and see if they can incorporate lines about its importance to the planet to create their Water poem.

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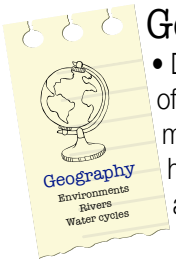
River Life

Resources during visit:

- Use on-site **PUPILS' GREY and BLUE RESOURCE RUCKSACKS** for clipboards, nets, magnifying insect viewers, binoculars and waterproof mats in case of rain.
- You will also need the **TEACHER'S BLACK RESOURCE RUCKSACK** for the same items, plus the **Collins Complete Guide to British Wildlife** book and laminated **Name that Mini Beast resource sheet**.
- **School to supply:** drawing and writing materials (pens / pencils and paper).
  Printouts of the **Name that Mini Beast resource sheet.**

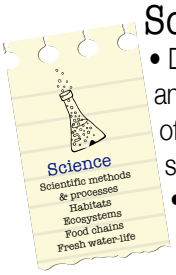
Curriculum links:

Geography:



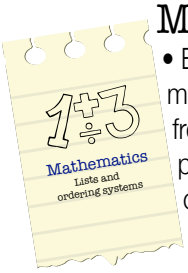
- Develop contextual knowledge of the location of globally significant places – both terrestrial and marine – including their defining physical and human characteristics and how these provide a geographical context for understanding the actions of processes.
- Understand the processes that give rise to key physical and human geographical features of the world, how these are interdependent and how they bring about spatial variation and change over time.
- Collect, analyse and communicate with a range of data gathered through experiences of fieldwork that deepen their understanding of geographical processes.
- Interpret a range of sources of geographical information, including maps, diagrams, globes, aerial photos and Geographical Information Systems (GIS).

Science:



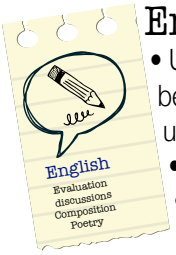
- Develop understanding of the nature, processes and methods of science through different types of science enquiries that help them to answer scientific questions about the world around them.
- Develop scientific knowledge and conceptual understanding through the specific disciplines of biology, chemistry and physics.
- Are equipped with the scientific knowledge required to understand the uses and implications of science, today and for the future.

Mathematics:



- Become fluent in the fundamentals of mathematics, including through varied and frequent practice with increasingly complex problems over time, so that pupils develop conceptual understanding and the ability to recall and apply knowledge rapidly and accurately.
- Reason mathematically by following a line of enquiry, conjecturing relationships and generalisations, and developing an argument, justification or proof using mathematical language.
- Can solve problems by applying their mathematics to a variety of routine and non- routine problems with increasing sophistication, including breaking down problems into a series of simpler steps and persevering in seeking solutions.

English:

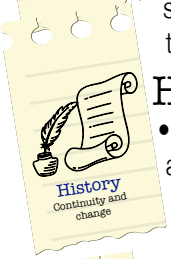


- Use discussion in order to learn; they should be able to elaborate and explain clearly their understanding and ideas.
- Comprehension (both listening and reading).
- Articulate and justify answers, arguments and opinions.
- Consider and evaluate different viewpoints, attending to and building on contributions of others.
- Composition (articulating ideas and structuring them in speech and writing).

Art & Design:

- Become proficient in drawing, painting, sculpture and other art, craft and design techniques.

History:



- Understand historical concepts such as continuity and change, cause and consequence, similarity, difference and significance, and use them to make connections, draw contrasts, analyse trends, frame historically-valid questions and create their own structured accounts, including written narratives and analyses.

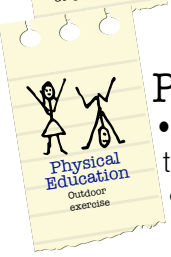
Citizenship:

- Develop an interest in, and commitment to, participation in volunteering as well as other forms of responsible activity, that they will take with them into adulthood.

Design & Technology:

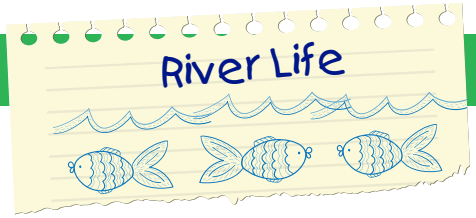
- Develop the creative, technical and practical expertise needed to perform everyday tasks confidently and to participate successfully in an increasingly technological world.

Physical Education:



- Are physically active for sustained periods of time.
- Lead healthy, active lives.

Resource sheet
Name that Mini Beast



Courtesy of the Eden Rivers Trust

Name that mini beast
Activity sheet

How many different types of mini beasts can you spot in your local river*?

Beneath the surface of your local river, you'll find a secret underwater world full of tiny creatures.

These mini beasts are a vital part of the river system, providing food for larger creatures and keeping the river bed clean.

You will need

A fishing net
A bucket (filled with water from the river)
Magnifying glass (optional)
Identification key
Wellies or old trainers

***Parents/tutors:** Only hunt for mini beasts from June to October so that you don't disturb any spawning or migrating fish!

1. Find a shallow part of the river where the water is moving (if the river is still the mini beasts won't go into your net!) Stand, holding your net as shown in the picture, so that it rests on the river bed.

2. To catch mini beasts, 'kick' the river bed in front of the net with your foot so that the mini beasts are lifted from the river bed into your net.

3. Empty your net into your bucket. Now you're ready to identify what you've caught and find out some fascinating facts about each creature by using the identification key on the following pages.

Once you have identified them, carefully put the mini beasts back in the river where you found them!

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Eden Rivers Trust

River Life

Resource sheet
Name that Mini Beast

1 Has it got a shell?

Yes

Bladder Snail
- up to 12mm high
- clockwise spiral
- prefers standing/still water

Freshwater Limpet
- very tiny, usually 2-4mm
- likes high oxygen levels in water
- found in rivers and lakes in still to fast flowing water

Nerite Snail
- 7-10mm high
- found in large flowing waters such as rivers

Valve Snail
- 6mm tall
- anti-clockwise spiral
- also known as freshwater winkle

Jenkins Spire Shell
- 4-5mm high
- anti-clockwise spiral

Bi-valve Mollusc
- very small, usually 2-4mm
- shell consists of two hinged valves

Ram's horn Snail
- move with a gliding motion
- generally 4 - 8mm in size (but can reach up to 25mm)
- flattened coil with no spire or point (like a ram's coiled horn)
- found in still water on plants at the pond margin

Wandering Pond Snail
- up to 18mm tall
- anti-clockwise spiral
- found on aquatic vegetation in slow-moving or still water

NO

River Life

Resource sheet
Name that Mini Beast

2 Has it got a case?

Yes

Cased Caddis Fly Larvae

Sand grains (Limnephilids)
- straight or curved case made from sand grains
- larger sand grains often located on sides
- found in both stony- and sandy-bottomed streams
- case length may be larger than 25mm

- straight case made from fine sand particles
- case widens towards head end
- common in still or slow flowing water

Plant material (Limnephilids)
- case based on pieces of twig
- straight case
- case around 30mm long by 8mm wide
- found in rivers and streams

- case is a mixture of both living and dead plant material
- straight case
- very chunky case, about 20mm long by 10mm wide
- found in still or slowly flowing water

Saddle Case (Glossosomatids)
- case made from a mound of sand grains
- firmly fixed to underside of rocks in groups
- found in rivers and occasionally lake shores
- case length may be larger than 6mm

The Grannom (Brachycentrids)
- square shaped case in cross section
- case made of living plant material or closely bound silk threads
- commonly found attached to plants
- found in fast flowing rivers and streams

NO

River Life

Resource sheet
Name that Mini Beast

3 Has it got six legs and three tails?

Yes

Upwing Nymphs (Mayflies)

Stone Clingers (Heptagenids)
- plate-like gills held out sideways
- flat and wide body with eyes on the top of the head
- clings to rocks and cobbles in fast flowing rivers and streams
- up to 15mm in length

Laboured Swimmers (Leptophlebids)
- poor swimmers preferring slow flowing water
- long feathery gills along side of body
- tails are as long as the body
- up to 10mm in length

Agile Darters (Baetids)
- small leaf-like gills located on side of body
- rounded stream-lined body (torpedo-shaped)
- shorter middle tail
- moves around in fast flowing rivers and streams
- up to 10mm in length

Silt Crawlers (Caenids)
- gills located on back hidden under two large wing cases
- prefers slow flowing and still water
- smallest nymph reaching just 8mm

***Don't forget:**
Only hunt for mini beasts from June to October so that you don't disturb any spawning or migrating fish!

Resource sheet
Name that Mini Beast

3 Has it got six legs and three tails? (cont)

Yes

Moss Creepers (Ephemerellids)
- poor swimmers (swim with a 'rocking horse' movement)
- gills located on the back of the body (move with a rippling effect)
- striped tails and legs
- 7 - 11mm in length

Burrowers (Ephemerids)
- largest of the upwings reaching lengths of 3cm
- live in tunnels beneath the mud, sand and gravel
- strong legs for burrowing
- feathery gills found on the back of the body rather than at the sides
- tusk like mouth parts

Damselfly Nymph
- hinged, extendable jaw called a 'mask'
- flat leaf like tails form gills
- found in still water amongst vegetation
- up to 4.5cm in length

Dragonfly Nymph (Darter)
- short spiky tails
- hole at rear end used to suck in water to internal gills
- hinged, extendable jaw called a 'mask'
- found in still water among plants or in mud
- up to 2.5cm in length

No

River Life

Resource sheet
Name that Mini Beast

4 Has it got six legs and two tails?

Yes

Stonefly Nymphs
- varies in size - between 7 - 25mm in length
- live in fast flowing stretches of rivers and streams
- move in a lazy, sluggish manner
- needs highly oxygenated, clean water

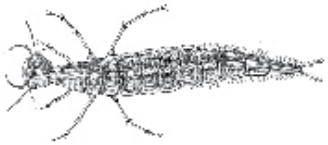
Caseless Caddis fly Larvae

Bag maker (Philopotamus)
- creamy/yellow body with reddish head
- found in fast flowing water
- hooked tails
- live inside a finger-shaped net

Free living (Rhyacophila)
- bright green in colour especially on underside
- bunched gills visible along body
- body visibly segmented
- found in running water

Net maker (Hydropsyche)
- dark brown in colour
- hairy tails & feathery gills along body
- live in stone shelter with a net at front
- net used to catch food particles

Great Silver Beetle Larva
- fat and greyish, thinning towards the tail end
- two short, hooked tails
- found in still water in pondweed & thick vegetation
- slow walking, poor swimmer
- largest larvae growing up to 6cm in length



Great Diving Beetle Larva
- yellow to light brown in colour
- short hairy tails
- visible 'pincer-like' jaws
- found in still water
- up to 6cm in length

Dragonfly Nymph (Hawker)
- short spiky tails
- tiny wing cases on its back
- hinged, extendable jaw called a 'mask'
- found in still water among plants or in mud
- up to 5cm in length

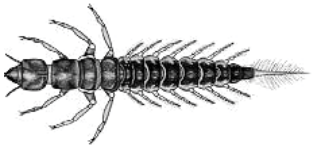
No

River Life

Resource sheet
Name that Mini Beast

5 Has it got six legs and one tail?

Yes



Alderfly Larva
- large head with powerful jaws
- feathery gills along the body
- long spiked tail gill
- found in ponds and slow flowing streams in mud or silt
- up to 17mm in length

Water Stick Insect
- found in still or slow moving water such as ponds and lakes
- long tail used as a breathing tube
- piercing tube-like mouth part
- looks like a twig or rolled up leaf
- can reach 5cm in length

Water Scorpion
- found in still water such as ponds
- grey/brown flattened body - looks like a dead leaf
- piercing tube-like mouth part and long tail used as a breathing tube
- slow moving, often found crawling across the bottom of the pond
- two pincer-like front legs for catching prey
- generally 18 - 22mm in length (but can be up to 3cm)

No

River Life

Resource sheet
Name that Mini Beast

6 Has it got six legs and no tail?

Yes

Whirligig Beetle Larva
- pair of hair-like gills on each segment of the abdomen
- four gills on the rear
- common in ponds and slow moving streams
- 3 - 8mm in length

Whirligig Beetle
- Found swimming on the surface of ponds or slow moving streams
- move in a 'whirling' pattern across the water surface
- eyes are in two parts for seeing above and below the water
- metallic black/green in colour with orange legs
- 5 - 7mm in length

Great Diving Beetle
- Size of a 50p coin (around 3cm in length)
- dark brown/black in colour with yellow edges to the wing cases
- ridged wing cases in females, smooth in males
- found in both rivers and ponds

Great Silver Beetle
- the largest water beetle reaching 4cm in length
- shiny black wing cases with a silvery belly
- favours still water such as ponds and ditches
- very rare

River Life

Resource sheet
Name that Mini Beast

6 Has it got six legs and no tail? (cont)

Yes

Small Diving Beetle
- found in fast flowing rivers and streams
- blotchy, yellow and black body
- fast moving
- 3 - 5mm in length

Backswimmer (Waterboatman)
- found in slow moving rivers and ponds
- swim on their backs
- powerful oar-like back legs for swimming
- reaches 14 - 17mm in length

Lesser Waterboatman
- common in ponds and slow moving rivers
- swim on their bellies (ie the right way up)
- powerful oar-like back legs for swimming
- can reach up to 10mm in length

NO

***Don't forget:**
Only hunt for mini beasts from June to October so that you don't disturb any spawning or migrating fish!

River Life

Resource sheet
Name that Mini Beast

7 Has it got more than six legs?

Yes

Water Mite
- tiny, the size of a pin head (at most 2mm in length)
- moves very quickly
- comes in many different colours
- has 8 legs (belonging to the spider family)
- common in fast, slow and still water

Freshwater Hoglouse (Water Slater)
- resembles a woodlouse
- segmented body and a large pair of antenna
- has 7 pairs of legs
- often found in still or slow moving muddy water
- can reach up to 20mm in length (generally about 8 mm)

Freshwater Shrimp
- swim very quickly on their sides
- varies in colour from pale cream to dark grey
- up to 15mm in length
- found under stones on river bed
- common to fast flowing rivers and streams

White Clawed Crayfish
- olive green to brown in colour
- large front claws and a pair of long antennae
- can reach up to 12cm in length
- needs fast flowing, clean water to survive
- lives in burrows under rocks and stones

No

River Life

Resource sheet
Name that Mini Beast

8 Is it like a caterpillar or a grub?

Yes

Cranefly Larva
- tough skin
- found in slow moving water in mud and silt
- breathing holes and horns to grip with are found at the rear end
- can reach up to 5cm in length

Blackfly Larva
- found in fast flowing water
- 'club' shaped with fatter end attached with hooks to rocks
- narrower 'head' end with two fan-shaped structures to catch food
- up to 10mm in length

Mosquito Larva
- attach to the water surface by a breathing tube
- fine hairs attached to a segmented body
- large head with bristles on mouth parts to filter food
- up to 10mm in length

Phantom Midge Larva
- transparent and difficult to see
- moves quickly by flicking its body
- large eyes and brush-like mouth parts
- up to 14mm in length

Midge Pupa/Mosquito Pupa
- both comma shaped, with a big head and short, curled tail
- some have feathery tufts on their heads
- moves quickly with a flick of its tail
- up to 10mm in length

Rat-tailed Maggot
- caterpillar-like body with short stumpy legs (pro-legs)
- long tail-like breathing tube
- reaches about 15mm in length (without tail)
- found in dirty water

No

River Life

Resource sheet
Name that Mini Beast

9 Is it long and thin like a worm?

Yes

Non Biting Midge Larva
- less than 15 segments to body
- may have very tiny 'pro-legs' like a caterpillar
- come in a range of colours
- usually no more than 20mm in length

Bloodworm Midge Larva
- bright red in colour
- feathery tufts on its head
- has a characteristic thrashing movement
- can tolerate quite dirty water
- can reach up to 20mm in length

Biting Midge Larva
- has a characteristic thrashing movement
- 'U' shaped when at rest
- can range in colour from creamy yellow to green

Riverworm
- looks like an earthworm
- ranges in size from a few mm to several cm

Hair Worm
- looks like a string of liquorice or black wire
- firm to the touch like a piece of wire
- can be up to 40cm long

Leeches
- flattened with suckers present at both ends of the body
- can be up to 20cm long
- moves like a caterpillar
- swims with a wave (ribbon) motion through the water

Flatworms
- very tiny, less than 10mm in length
- have visible horn shaped projections on head
- moves with a gliding motion (like snails)

NO

River Life

Resource sheet
Name that Mini Beast

10 Is it like a fish?

Yes

Stickleback
- small and silvery in colour
- 3 spines located on its back followed by a soft fin near the tail
- usually no more than 7.5cm in length
- found in most types of water but prefers slower moving water

Minnow
- dark horizontal stripe along it's body
- distinctive silver belly
- can reach up to 10cm in length
- likes clean water with sandy/gravelly river bed

Stoneloach
- fleshy whiskers around its mouth used to forage for food
- spotted or striped fins
- reaches 5 - 10 cm in length

Bullhead
- large head and a thin body with big eyes
- large pectoral (side) fins used to pull itself along the riverbed
- has a slimy skin instead of scales
- can be up to 15cm in length (usually 7 - 10cm)
- found under stones in fast flowing rivers and streams

Resource sheet
Name that Mini Beast

Is it like a fish (cont)?

Yes

Salmon Fry
- 'adipose' fin present (small fin behind the dorsal (back) fin)
- has a pointed nose
- 'v' shaped tail fin
- has 'finger-like' markings along body
- found in well oxygenated streams and rivers

Trout Fry
- 'adipose' fin present (small fin behind the dorsal (back) fin)
- has a blunt nose (bullet shaped)
- has a 'c' shaped tail fin
- distinctive red/orange/ fins
- found in well oxygenated streams and rivers

Lamprey
- eel-like in shape but without any 'pectoral' (side) fins
- has seven holes (open gills) along either side of its head
- jaw-less with a round sucker-like mouth
- can reach up to 1 metre in length

Eel
- single long fin on back
- pair of 'pectoral' (side) fins
- pointed nose with visible jaw
- gills present like fish
- can grow up to 1.3m in length

Photos: Margaret Holland, Richard Clark, Simon Pawley, FBA
Stuart Crofts, K Galt, Tweed Foundation

End

Resource Sheet - Kearsney Parks Sketch Map

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