WWF
FOR YOUR WORLD

LEARN TO LOVE NATURE

EDUCATOR GUIDE: FRESHWATER

INSTRUCTIONS

1. Direct students to watch the Our Planet Freshwater episode on YouTube.

   OR discuss freshwater on a class call, and show the Freshwater Biome Tour video on *ourplanet.com* to fuel a class discussion on the qualities and importance of freshwater ecosystems to people, wildlife and the planet. Tips for using videos to prompt constructive discussions can be found in the Our Planet Their Future Educator's Guide.

2. Direct students to watch How to Save Freshwater Flow, on ourplanet.com, narrated by Sir David Attenborough.

3. Direct students to spend some time visiting the Freshwater biome on our explorable globe, and use the information there to complete the questions and tasks below.

1. List examples of freshwater habitats and the species that can be found there	
Freshwater Habitats (target: 4	**Freshwater Species** (target: 5)
Rivers, lakes, streams, canals, wetlands, marshes, ponds	*Pike, eel, mayfly, frog, pond skater, common newt, dragonfly, otter, water vole, river dolphin, caiman, water lily, manatee, pond snail*
2. Approximately what percentage of the water on our planet is fresh?	
2%	
3. Give four reasons why it is important that freshwater on our planet is allowed to flow?	
• *Everything on this planet (from insects, plants and humans) need freshwater to survive.* • *Freshwater habitats such as lakes and rivers provide a home to millions of creatures.* • *Without freshwater flow, many species would be unable to complete their life cycle or natural migrations.* • *The flow of freshwater carries sediments and nutrients that help sustain food chains, shape landscapes and fertilise the places where we farm.*	
4. What effects are dams having on freshwater environments?	

- *We are moving water from where it should be to where we want it to be*
- *Large bodies of water and torrents are now reduced to trickles*
- *Rivers dry out which means fish stocks plummet, crops fail, and the availability of drinking water is reduced*
- *Freshwater species are unable to complete their life cycles*

5. How many large dams over 15 metres are there around the world?

58,000

6. What can be done to lessen the impact of dams on the environment?

- *Use other reusable energy such as wind or solar to replace the need for mega hydropower dams*
- *Remove those which are closed, obsolete or damaged*
- *Make sure dams are built in the best and most efficient places*
- *Allow dams to replicate natural pulses (I.e higher volumes due to rains, ice melts). Periodically release water at the right times which will enable fish to spawn, sediment and nutrients to be dispersed and create natural flooding to maintain wetlands and fertilise farmlands.*

7. What percentage of all extracted water is used for agriculture and industry?

90%

8. Name a city that is experiencing issues from extracting too much water. What problem is this city facing?

Jakarta, Indonesia

The city is sinking in places and experiencing flooding

9. How can the amount of water used in agriculture and industry be reduced?

- *Plant the right crops in the right place instead of transporting water*
- *Return unused water*
- *Industries can use new technologies to use, clean and recycle water back into their systems.*

10. How can cities be designed to help freshwater flow?

- *Build green walls and roofs*
- *Permeable pavements*
- *Restoring riverbanks and wetlands, which will also help prevent flooding*

11. It's not only industries and agriculture that use our planet's freshwater. We use water in our homes daily. Make a list of all the ways you or your family use water at home and what you could do to use less.	
Ways we use water	**Ideas to save water:**
12. Writing Task	
Imagine you're a wildlife journalist reporting on a new dam that has been proposed to be built across a large river (you can choose and research a river of your choice). Write an article explaining the importance of freshwater and the impact this dam will have on both humans and the species that live there. Don't forget to include an alternative solution, an attention-grabbing headline, facts and quotes from the experts and an interesting image!	

LINKS TO THE SUSTAINABLE DEVELOPMENT GOALS

- Goal 6: Ensure access to water and sanitation for all. un.org/sustainabledevelopment/water-and-sanitation/
- Goal 14: Conserve and sustainably use the oceans, seas and marine resources. un.org/sustainabledevelopment/oceans/
- Goal 15: Sustainably manage forests, combat desertification, halt and reverse land degradation, halt biodiversity loss. un.org/sustainabledevelopment/biodiversity/

Ensuring a healthy and productive future for our freshwater habitats also contributes to other SDG goals, including the following:

- GOAL 1: No Poverty
- GOAL 2: Zero Hunger
- GOAL 3: Good Health and Well-being
- GOAL 12: Responsible Consumption and Production

DISCUSSION PROMPTS

Use these prompts to generate a class or small group discussion online based on the Freshwater episode of Our Planet, or videos on ourplanet.com.

1. **What is freshwater?**

   You may need to explain that the waters of the oceans are salty and so we can't use them in the same way.

2. **Have you ever spent time by a river, stream or lake? What did you do? What was special about this place?**

   Allow children time to begin by discussing their own experiences.

3. **What freshwater ecosystems can you think of?**

   Some are very well known, such as the Amazon river but be sure to mention local ponds and rivers.

4. **What plants and animals can you think of that might live in these places or depend on freshwater habitats generally?**

   EG fish, shrimp, otters, beavers, kingfisher, herons, plants, algae, mayflies, river dolphins

5. **Why is freshwater important to us and our planet?**

   - Flow - Carrying nutrients and water that plants and animals need to live.
   - Allowing wildlife to travel and complete their life cycle.
   - Fish for us to eat, water for us to grow crops and drink

6. **Why is freshwater important to us? Think of all the ways that you use water.**

Encourage children to come up with as many ideas as they can including drinking, bathing, flushing toilets, washing up, cleaning, watering gardens and crops, washing the car, for leisure activities such as canoeing, swimming or fishing and, indirectly, through any electricity we use.

7. **What problems are affecting the flow of water?**

Overuse of water by people and on farms. Dams that don't allow water to flow through carrying fish and nutrients to where they are needed. Farming and settlements causing pesticides to drain into freshwater habitats

8. **What could be done differently?**

Fewer dams, or dams that allow water and fish to pass. Less water waste. Farming without pesticides and chemicals

9. **Can you think of what you can do to save water?**

It is important that children feel empowered to do something themselves such as taking showers rather than baths, turning off the tap while brushing their teeth etc.

EXTENSION ACTIVITY IDEAS

KS2-3

Activity idea	Subjects
Young people keep a log of how much water they use in one day. Compare it with others and see if there are any ways in which they could save water. After a week, do the same thing and see who has lowered their water use by the most.	**Citizenship**
Create and observe your very own Freshwater Ecosystem in your garden or local green space! It's easy to do and will quickly provide a freshwater haven for local wildlife on your doorstep! You will need (student worksheet provided): • A large container that will hold water • Some gravel • Some rocks/bricks of different sizes • Some small aquatic plants (optional) • Rainwater	**Science**
Recreate the salmons' journey upstream to spawn by setting up a salmon migration obstacle course at home. Don't forget to take pictures! scienceworld.ca/resources/activities/salmon-migration-obstacle- course Afterwards, consider what humans could change to increase the number of salmon who make it upstream to spawn. How would that help people?	**Geography, Science**
Create a mini landscape from soil in a tray and sow cress seeds over the whole surface. Raise one end by a few centimetres to create a slope and ensure drainage and a container to catch water at the other end. Pour a glass of water into a single point in the centre of the highest point of the tray and let it run down through the landscape creating a river system. Each day pour another glass of water into the same point. Observe where the cress grows and how this corresponds to the river system. After a while, place one or more dams (erasers or pieces of thick card) at key points in the river system, and halve the amount of water you add each day. See what effect this has on the landscape after a few more days of watering. Discuss how this reflects the real world, and what could be done about it.	**Geography**
Write and illustrate a first-person story or diary from the perspective of a salmon, imagining the challenges and dangers they may face.	**Literacy, Geography, Art**
Create a freshwater mural or collage.	**Art**

KS3-4

Activity idea	Subjects
Create and observe your very own Freshwater Ecosystem in your garden or local green space! It's easy to do and will quickly provide a freshwater haven for local wildlife on your doorstep! You will need (student worksheet provided): • A large container that will hold water • Some gravel • Some rocks/bricks of different sizes • Some small aquatic plants (optional) • Rainwater	**Biology**
Imagine you've been asked to direct a TV advert for WWF to raise awareness about the importance of freshwater and the need to look after this precious resource. 1. Use the WWF-UK and Our Planet websites to research why freshwater is so important and ways we can preserve water at home. You'll need some facts and statistics to ensure your ad is accurate! 2. Next, draw a storyboard to plan the filming shots for your tv advert. Underneath each square, plan a persuasive voice-over to accompany your film. 3. Lastly, why not have a go at filming your ad! Using a mobile, webcam or camera see if you can bring your vision to life! Recruit a family member to help you film or provide a voice-over.	**English, Drama, Art, Citizenship**
Watch these videos: Our Planet Pioneers: Sponge, Cities , Our Planet Pioneers: Vertical Farming **Brief 1 (Challenge level - high):** Design a product, process or system that could help protect or save our freshwater resources. You could think about how we could make use of solar or wind energy to improve industry or agriculture. Or, think closer to home and design a product that could help us conserve water at home. Be creative! **Brief 2 (Challenge level – low):** Design a piece of merchandise that could be sold in the WWF gift shop to help raise money for freshwater conservation projects. Remember, your design should be relevant to the topic and your product must use recycled and/or sustainable materials. You can draw your design on paper with a pencil and rule, or electronically if you wish. Remember to label it clearly and in detail.	**Design Technology, Product Design**
Carry out a pond dipping activity, and use the Our Planet citizen science app (Seek) or reference books to identify the range of wildlife and plants that live in the habitat. **Activity 1:** Draw a diagram of the habitat you have chosen and label the biotic (living) and abiotic (non-living) factors you can see. **Activity 2:** Choose an organism (animal/plant) you have identified. Sketch it (or use an image online) and then label any adaptations that help it to live in an aquatic/semi-aquatic environment.	**Biology, Art**

MAKE IT! A MINI WILDLIFE POND

1. Find or buy a large container. We used a large 48 litre laundry tub but you can use any large container you've got at home - from a washing up basin to an old plant pot - as long as you make it watertight.
2. It's a good idea to position your container whilst it is still easy to carry - before you add any rocks or water. If you can, choose a place that will get a good amount of sunlight.
3. If you want to, you can dig a hole and sink your pond into the ground so that the edges are level with surface. This way, more wildlife may find its way to your pond.
4. If you leave your pond raised above the surface, ensure you build steps leading up to your pond so that frogs and other wildlife can make their way to your new freshwater oasis.
5. It is equally important to make sure you have steps or levels within your pond. Create different levels in your container using bricks or large stones to help wildlife in and out of your pond. You can create a substrate layer at the bottom of your pond by adding gravel.
6. Next, fill your pond with water. Tap water is fine (*NB it will take 2-3 days for the water to be wildlife safe*) but if you have access to a water butt/rainwater then this is ideal.
7. Lastly, you can add your aquatic plants to help oxygenate your new freshwater habitat. Opt for native plants wherever you can, and if collecting from a local pond ensure that you take only a little so as not to harm wildlife.

Monitor the species that visit your new habitat with the free Seek nature ID app!

wwf.org.uk/discover-nature-seek-app