Teachers' Notes

Background Information

In Clackmannanshire we are lucky to have many bodies of freshwater, both man-made and natural. These range from the River Devon and the small streams running off of the Ochils to Gartmorn Dam, a large reservoir which was once used as a drinking water supply.

The animals and plants living in our freshwaters are very susceptible to outside influences: sudden and seasonal changes in water levels, changes in nutrient levels and in particular, pollutants.

Pollutants will affect the amount of oxygen in the water. Unpolluted water is clear and contains plenty of oxygen. Invertebrates living in the water are particularly sensitive to oxygen levels and those such as mayfly larvae need very clean, oxygen-rich water. They will not tolerate pollution whereas other invertebrates, such as a rat-tailed maggot, can tolerate some pollution and therefore lower oxygen levels.

Different invertebrates will live in the water depending on how polluted it is and these different species can be used as indicators as to the health of the water.

Obviously the presence or absence of these invertebrates will have a direct effect on the other animals and plants living in the water, as these invertebrates perform many vital roles in the food web of a particular body of freshwater.

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Learning Outcomes

This pack will help the children to:

- Take an interest in their local stream, burn or river.
- Learn about the wildlife living around and in the water.
- Begin to assess how healthy the water is by looking for 'indicator invertebrates'.
- Begin to understand the impact that humans can have on an ecosystem.
- Realise how important invertebrates are to other river animals and to a healthy river ecosystem.

Safety First

You should visit the stream or river before you deliver the lesson to find suitable places for the children to access the water. Is there a low bridge or decks you can use? How deep is the water? If it is only ankle deep consider letting the children go into the water.

NB: The depth of a stream or river can vary dramatically at different times of the year and after heavy rain– always check first.

If you are dividing the children into groups, it is safer to have only one or two children, from each group, at the water's edge or in the water. The rest of the group should be back from the edge with the trays and pots.

Weil's disease is water-borne so all cuts should be covered and consider using plastic gloves. Hands should be washed at the end of the trip.

Your school should have its own risk assessment for taking children out of school on trips.

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OCHILS Landscape Partnership

Equipment needed

Wellies
One fine-mesh net or fine sieve per group
One white tray or ice-cream tub per group
Magnifying glasses
White plastic spoons and small clear pots with lids
Laminated copies of Worksheet 1 and whiteboard pens – one per group; results can be pooled back in the classroom
Identification books for river wildlife or the Field Studies Council produce a very good 'Freshwater Trail' which is a laminated guide.

Lesson Duration

We would recommend spending a whole morning or afternoon at the stream or river. At least one further lesson would be require to pool results and discuss findings and for the children to air their views about their local river or stream.

Preparation

Note: the children may understand the term minibeast better than invertebrate, depending on their age.

In the classroom explain to the children why they are visiting the stream or river and what they are looking for. Explain that the presence or absence of certain minibeasts in a river can give an indication to the health of that river. Briefly discuss what influences the health of a river eg: sewage, herbicide and pesticide run-off from fields, people dumping things in the river. Run through Worksheet 1 and introduce the idea of 'indicator minibeasts'.

Make sure the children understand that the minibeasts should be treated gently, always kept in water and returned to the river or stream at the end of the session.

he European Agricultural Fund For Rural Development: Europe investing in rural areas
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Scottish Natural Heritage Dualchas Nàdair na h-Alba All of nature for all of Scotland Nàdar air fad airson Alba air fad
Year of Natural Scotland 2013

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At the river or stream, demonstrate how to fill the trays with water and use the net in the water, sweeping it backwards and forwards and into the weeds. Try not to fill the net with loads of mud or gravel. Take the net onto the river bank and to empty it, turn it inside out into the trays.

Demonstrate how to carefully lift a minibeast with the spoon, into the pots, which should have water in them. Findings can then be viewed with the magnifying glasses. Use the key to try and identify if any 'indicator minibeasts' are present. Demonstrate how to turn over small rocks to see what is hiding underneath– some minibeasts like to grip onto rocks or hide in amongst the stones.
Remind the children to record what they find.

Back in the classroom, pool results and discuss what the children saw and what minibeasts they found.
What are their views on the health of their river or stream? Worksheet 2 can be used to indicate how healthy your local river is.

Lesson Extensions

- Make a small project book. The children write up their day, what they discovered and their thoughts on how healthy their river or stream is.
- Use the information contained in Worksheet 3 to construct simple food chains or a more complicated food web for the wildlife in a river, burn or stream. (See the additional teachers' sheet giving ideas for simple food chains and a more complicated web).
- The children illustrate the wildlife they found at the river or stream as a wall collage, taking a cross-section view of the river.
- Link their study of their own river, burn or stream to the bigger picture – The Water Cycle.

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