

PROTECTING OUR FRESH WATER ECOSYSTEMS

A science and social studies unit dealing with threats to our precious fresh water ecosystem brought to you by:



Draft Curriculum Areas: Levels 3-4

Social Sciences Strands:

Place and Environment:

- Learning how places and environments reflect past and present interactions with people.

Social Inquiry:

- Through research, students will learn how groups of people can make decisions and take actions that will have a positive effect on our environment and the consequences for society if we do not take these actions.

Science Strands

Living World:

- Learning how living things are suited to their particular environment and how they respond to environmental changes.

English Strands:

- Using appropriate ways of gathering knowledge and communicating these ideas to the wider community:

Links to Technology and Health & Phys Ed.

- Do the class know that small creeks, ponds and wetlands are also important fresh water ecosystems?
- Introduce the idea that they can be thought of as underwater gardens or ecosystems where plants, fish and other creatures live. How many plants, fish and other inhabitants of these ecosystems can the class brainstorm?



Didymo. Photo courtesy of Fish & Game New Zealand

- Have students conduct online research to build up their list of inhabitants at: www.freshwater.org/index_wildlife.html and www.doc.govt.nz > Under conservation > select fresh water **eg** small fish, eels, bullies,
- Remind students about how the garden ecosystem fits together. Challenge them build up a fresh water web of life, **eg** do they know that:
 - *underwater plants help keep the water clean and provide places for fish to live, provide food to eat and places for them to hide from larger predators*

THINKING ABOUT ECOSYSTEMS

- Through class discussion, find out what students know about the relationships between plants and animals in an environment such as a garden. To develop the idea of interdependence, discuss the following ideas:
 - *flowers require insects to fertilise the seeds so new plants can grow*
 - *bees and insects require pollen collected from flowers*
 - *birds eat a large range of insects*
 - *flowers and trees need birds to disperse pollen and seeds.*
- Develop the idea that the relationships between all plants and animals create what we call an ecosystem and that if we change the relationship between just one plant and animal, it changes the whole ecosystem.
- Have students speculate on the consequences of removing birds or insects from a garden ecosystem.

OUR FRESH WATER ENVIRONMENTS

- What fresh water environments (streams rivers, lakes, ponds etc) can the students identify in the local and wider community?
- Have students consider the importance of these environments to the community, and say why they are important, **eg**
 - *by adding beauty (aesthetic appeal)*
 - *providing recreational and sporting uses*



Water Hyacinth. Photo courtesy of Rohan Wells, NIWA

ECOSYSTEMS CAN BE THREATENED

- Talk about how land-based problem pests and plants such as gorse and the possum have already caused harm to our environment. Do students know that the possum was introduced to start a fur trade and that gorse was introduced as a plant for hedges?
- Stress the point that when we change or introduce some thing into our ecosystem it can cause major problems.

INTRODUCING BIOSECURITY NEW ZEALAND

- Tell students that we have a special organisation called Biosecurity New Zealand who have the task of keeping unwanted pests and diseases out of New Zealand. Biosecurity New Zealand also has the task of trying to get rid of them if they arrive or control them if we can't get rid of them completely.
- Can students think of any problems we have had recently with introduced pests? **eg**
 - *the spraying programme in Auckland to eradicate the painted apple moth and in Hamilton to eradicate the Asian Gypsy Moth.*
- Visit www.biosecurity.govt.nz > select Pests and Diseases > select Pests and Diseases list.
- Print out/photocopy sufficient copies and distribute to the students

PROMOTING THE CHECK, CLEAN, DRY MESSAGE

CONDUCTING WEB RESEARCH

- Are the students surprised by the large number of pests and diseases on the list? Which pests and diseases have they heard of before?
- Tell students that Biosecurity New Zealand is very concerned about some plants that have been found in many New Zealand streams, rivers and lakes. Have they heard of didymo? What do they know about it?
- Have students go through the list and identify any plant that is a threat to our fresh water ecosystem.
- Divide into web research groups and assign each group the task of researching the following fresh water pests by clicking on the link. Include the following:
 - *Didymo* - *Hornwart* - *Water Hyacinth*
 - *Arrowhead* - *Fringed Water lily* - *Hydrilla*
- Have students complete the following tasks
 - download and print out the pdf fact sheets and distribution sheets
 - print out the first page containing the picture and/or click/drag the picture onto the desktop to print out (in colour if possible)
 - *find out what it is* - *be able to describe what it looks like*
 - *find out where it is found* - *find out how it is spread*
 - *how it affects the ecosystem* - *how can it be stopped spreading?*
- Discuss and list any possible effects that the spread of these aquatic pests could have on future use of these areas by people (including tourism).
- Have each group prepare an illustrated report and present to the class. Put all reports on to a wall chart 'fresh water rogues gallery' for future reference.

TAKING POSITIVE ACTION AND GETTING THE MESSAGE OUT

- Tell the students that Biosecurity New Zealand wants to enlist their help in getting messages out to boaties and people who use waterways for recreation – especially with summer coming on. The messages will take two forms: teaching people to recognise these pests; and making sure they take special precautions to stop it spreading any further.
- Revisit www.biosecurity.govt.nz > Pests and Diseases > Pest and Diseases List. Select Didymo from the list and scroll down and print out the Didymo Fact Sheet as an example.
- As a class, read and discuss the simple Check, Clean, and Dry message that Biosecurity New Zealand wants to get out to people. Why do they think this message is so important to get across? How will it help stop the spread of didymo and other aquatic pests?

LET'S GET CREATIVE

- Have students brainstorm a list of interesting and effective ways they could use to get the Check, Clean, Dry out to boaties, fishers, family and friends. Try some of the following activities.
 - *an artistic poster display at a local shopping mall*
 - *a flyer for a district letterbox drop*
 - *prepare a class newsletter to distribute to parents and family friends*
 - *run a Save Our Waters session at the next school/class parents day. A boatie or fisher could be invited to talk to the parents.*
 - *give regular reminders at assembly for students*
 - *introduce parents and friends to the Biosecurity New Zealand website and show them how to find the information*
 - *prepare recognition picture flash cards for families to play as a game*
 - *prepare a special web page for the class or school website (include a quiz)*
 - *write and act out a Protecting Our Waters drama to present at the final assembly of the year or film in on video and produce a DVD (iMovie).*

