

WE MUST PROTECT OUR PRECIOUS ECOSYSTEMS

A science and social studies unit dealing with threats to our precious ecosystem from insect pests with a particular focus on the *Red Imported Fire Ant* 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:

- In the study, students will learn how people can take actions that will have a positive effect on our environment as well as identifying the consequences if we do not take these actions.

Science Strands

Living World:

- Learning how living things are suited to their particular environment and how an introduced pest or disease can destroy this balance.

English Strands:

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

Links to Technology and Health & Phys Ed.

- can come in in travellers' luggage
- be carried by the wind
- can be brought in on ships hulls and in the ballast water of ships.

A REAL-LIFE STUDY - THE RED IMPORTED FIRE ANT

Teacher Background and Preparation

The red imported fire ant is one of the worst invasive species worldwide. It is attracted to and damages outdoor electrical equipment (including traffic lights), undermines roads, destroys crops, kills reptiles, birds and small animals. If disturbed,



swarms of ants can inflict repeated and painful stings (see pictures). Single nests were located and destroyed at Auckland International Airport in 2001 and the Port of Napier in 2004. In June 2006 a nest was found 15 km north of Napier at a forest products site at Whirinaki. The nest was old enough for queen ants to have flown out and established other nests. Biosecurity New Zealand are on high alert for further nests and need the public to be vigilant.

Visit www.biosecurity.govt.nz > Click on Pests and Diseases > Select Pest and Diseases list > Scroll down and select Red Imported Fire Ant > Scroll down and download the pdf Fact Sheet. Photocopy and distribute sufficient copies to the class.

STUDENT RESEARCH PROJECT AND ACTIVITIES

- Give students a background briefing on the threat these ants pose to our crops, reptiles, birds and small animals. Relate this back to threats to our ecosystem.
- Speculate on the consequences for traffic control if they ever got established in our major cities.
- Using atlases, have students find the locations of the now destroyed nests and the incursion area at Whirinaki. Can the students say how they possibly arrived in the country (NB: Biosecurity have not so far found how they arrived)?
- Have individual students conduct research from the Fact Sheets and be able to talk about the following:
 - be able to give a physical description of the ant in terms of colour, distinguishing features and size
 - how can they be distinguished from a New Zealand ant?
 - be able to describe their nests and locations where nests will be possibly found
 - be able to describe the effects and actions taken by the ants when a nest is disturbed
 - know why humans should try to avoid disturbing them and actions they should take if they are stung
 - find out the native country of the ants and list the threats they pose to New Zealand if they ever become established here.

TUNING IN TO ECOSYSTEMS

- Check the students' knowledge of what an ecosystem is. What does the dictionary say? **eg**
 - the relationship between plants and animals and their environment
- Consider the following: A domestic cat is taken on holiday to an area where there are few, if any cats. Because of this the birds of the area have had little experience with cats. What would be the possible effect on the bird population?
- To revise the idea that if we change the relationship between just one plant and one animal, we change the whole ecosystem. Work through the ideas in Thinking About Ecosystems – previous Biosecurity unit, page 24, *starters&strategies*, Term 4, 2006.
- Remind students of the consequences of introducing the possum and rabbits to the New Zealand ecosystem. What damage do they do? Introduce the idea that we now spend millions of dollars every year trying to keep these pests under control.

WHAT IS BIOSECURITY AND WHO IS RESPONSIBLE?

- Introduce students to the idea that biosecurity is the name we give to our efforts to keep unwanted pests and diseases out of the country and that Biosecurity New Zealand is the name given to the government organisation who have the task of:
 - keeping unwanted pests and diseases out of New Zealand
 - trying to eradicate them if they do arrive
 - controlling them if they can not be eradicated.
- Have students brainstorm how unwanted pests and diseases might arrive in New Zealand, **eg**
 - they can stow away in shipping containers

WE CAN HELP BY GETTING THE MESSAGE OUT

The Painted Apple Moth has been eradicated from New Zealand by a major and costly spraying programme but we must keep a close watch in case it reappears and attacks our forests.



PAINTED APPLE MOTH – A SUCCESS STORY

- Do the students recall the extensive spraying programme in Auckland to eradicate the Painted Apple Moth? Was it successful? Have students check the pests and diseases list on biosecurity.govt.nz to check this out. Download the Painted Apple Moth FAQs sheet at: www.biosecurity.govt.nz/faq/term/911 and distribute to students. As a class discuss the following points:
 - why it is a pest?
 - how it threatens our forests
 - the economic costs to our economy
 - how the pest probably arrived
 - its two distinct stages and how to recognise it.
- Emphasise the fact that this is a success story for Biosecurity New Zealand but if it arrived once, it can arrive again unless we are really vigilant.

GROUP WEB RESEARCH ON INSECT PESTS

- Have groups conduct online research on the biosecurity.govt.nz site and count the list of pests and diseases we don't want in New Zealand. At random, have students select insect pests only and find out their status (*is not here* or *is here*), and why we do not want them here. Assign each group one of the following: *Gypsy Moth, Australian Subterranean/and or Dampwood Termite, Argentine Ant, Fall Webworm, Longhorn Beetle and Glassy Winged Sharpshooter.*
- Students prepare reports and present findings to the class paying particular attention to effects, identification details, and how to report these to Biosecurity NZ.

GETTING THE MESSAGE OUT TO THE LOCAL COMMUNITY

- Tell the students that Biosecurity New Zealand wants to enlist the help of students around the country to keep a close watch for these pests and, more importantly, get the message out to the local community. Have students brainstorm and list innovative and effective ways of getting this message out and/or chose activities from the following:
 - Design an ID sheet for each insect pest for display on the family fridge
 - Prepare a special web page/s for the class/school website outlining the problems these pests cause and links through to the Biosecurity pages
 - Prepare talks and ID sheets and run an information session for other classes in the school and/or a parents day at school
 - Encourage parents and family members to visit the Biosecurity website and help them locate the pests and diseases page where these pests are mentioned
 - Ask a local supermarket owner/shopping mall manager for permission to set up a stall where students can give out information and ID sheets. This could be rostered amongst groups as a regular once-a-week activity
 - Prepare and play 'recognise the pest' flash cards with friends and family
 - Design large colourful posters for display around classrooms and corridors of the school
 - Design and administer questionnaires to other students and to family members to find out their knowledge of the problem and to monitor the success of their campaign
 - Using papier mache and wire, construct 'monster' insect pests for a dramatic display at school or a shopping mall
 - Write letters to the local community paper to inform the community about the dangers these pests pose – include the phone number to call.



Painful stings of the Red Imported Fire Ant



(Citrus) Longhorn Beetle



Glassy Winged Sharpshooter

TRAVEL, BELONGINGS & MAIL

Visit the Personal Travel, Belongings and Mail section of the Biosecurity site and click on the **Arriving by Air** section of the site. Download and print off the pdf – **Declare it Brochure** and have students work through the **What You Cannot Bring** section. Through discussion, develop the idea that people who arrive back from overseas have an important part to play in keeping unwanted pests and diseases out of New Zealand. As a homework assignment, print out the **Declare it Brochure** and have them explain why this is necessary to their friends and family. Discuss the results with the class. How aware were their families of these regulations?