**Unit plan: Developing a biocontrol game**

**Overview**

Students of any level develop a board game illustrating knowledge of New Zealand’s possum problem and the strategies used to control it – including biocontrol strategies.

**Purpose**

To demonstrate through a board game the inter-relationships of organisms within a biological community, and the societal responses to a range of biocontrol solutions.

**Background**

**Suggestions for a scenario**

The local Forest and Bird Protection Society has asked your school to develop some board games that will explain why possums are pests and show that possum control involves people, lots of different initiatives and ongoing research.

**Where's the Biotechnology?**

Biological control (biocontrol) is based on interactions between organisms, where one organism is used to control the population numbers of another. In New Zealand, possums are regarded as pests and there have been proposals for introducing a biocontrol strategy to control possum numbers (see [possum biocontrol introductory article](https://www.sciencelearn.org.nz/resources/1082-biological-control-of-possums)). It is important that the case for biocontrol is fully discussed by all members of the community.

The development of a board game would provide students with an insight into the complexity of the problem, the advantages and limitations of biocontrol, as well as an opportunity for players to make their views known.

**Curriculum focus**

**Technology**

A location-specific solution is developed by utilising scientific understanding, technological knowledge and input of the community.

Biotechnological solutions cannot be introduced into a society without critical input from all members of the society (biotechnologists, ecologists, citizens).

**Science**

Interdependence of organisms within an ecosystem.

**Focus of skill & strategy**

To develop an understanding of the complexity of a biotechnological solution by developing a board game.

**Resources**

Story on investigations into the [biocontrol strategy for possums](https://www.sciencelearn.org.nz/resources/1082-biological-control-of-possums).

How many leaves does a possum eat in a night?

**Health and Safety**

Live possums have the potential to harm students. They are wild animals. Dead possums may carry TB and other potential pathogens. They should not be handled.

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| **UNIT PLAN: DEVELOPING A BIOCONTROL GAME** | | |
| **Suggested learning intentions** | Suggested learning experiences *The following learning experiences will provide you with starting points for an exploration of this topic. You may decide to narrow your focus to one component, or include most of the ideas in a unit that incorporates science and/or technology themes.* | Possible teaching/assessment activities |
| Possum damage can be estimated via a variety of indirect methods. | **Introduction**   * Visit a local area of bush and look for possum damage.   **Introduce the scenario**   * Explore the scenario to find out areas of expertise that need to be developed, for example: understanding the ecological niche of the possum, potential food chains, influence of biocontrol agents and ways to get community input. | Report on possum damage in your area by using an indirect method e.g. leaf damage, bark damage, variety of trees in a local area, estimation of possum appetite.  Depict a possum at the centre of a food web and the effect of its activities on NZ biodiversity (plants and animals). |
| The feeding habits of a possum explain its potency as a pest.  Biocontrol involves knowledge of the pest as well as the community’s acceptance of the proposed method. | **Developing expertise**  The level of expertise is dependent on the class. A number of options are presented below. Not all of these options will be appropriate for all levels.  Developing expertise in biocontrol   * Identify native plants and animals and how they interact in NZ forests. * Develop a chart to show the kinds of food a possum may eat. * What is biocontrol? Examine case studies of biocontrol. Get article: [Biocontrol](https://www.sciencelearn.org.nz/resources/1743-biocontrol) * Investigate a proposal for a biocontrol agent for possums. Get article: [Biological control of possums](https://www.sciencelearn.org.nz/resources/1082-biological-control-of-possums) | Draw up a list of consequences for the introduction of biocontrol to control possums. |
| The local community have opinions about the possum problem that must be considered. | **Accessing and consulting the community**  For example:  Ask Forest and Bird how they collect the opinions of the community.  Set up a story board and information site, for example in your school library.  Ask the community for their opinions.  Set up focus groups to consult community members about the acceptability of a range of possible possum control solutions. Collate the information for input into the development of the board game. | Develop a strategy for collecting and collating community opinions about the possum problem and control options. |
| The specifications of a board game must be closely linked to the interest and ability of a particular group. | **Develop expertise in making a board game**   * Survey a range of board games. * Survey some board games with a scientific focus. * Ask people (children / adults) about their favourite board games (questionnaire development). |  |
| The introduction of a biocontrol strategy requires input from a range of experts (e.g. ecologists, possum scientists). The views of the community are equally important. A biotech solution must reflect these viewpoints. | **Planning for practice**   * Interview a representative from the [Forest and Bird Protection Society](http://www.forestandbird.org.nz/) to find out specifications for a biocontrol game * Organise the group into areas of expertise, for example science research, survey of game options (questionnaire development), sourcingmaterials. * Draft a range of options and trial with experts and a focus group. | Students present the specifications for a board game to Forest and Bird Protection Society for their comments. The game may include the interactions between possums, plants, animals and the biocontrol agent.  The presentation of a board game that fulfils the specifications identified by Forest and Bird Protection Society and demonstrates that it has been modified according to trial participants’ input. |
|  | **Developing an outcome**   * Develop the game. Trial it. Adapt the game as a result of initial evaluation. * Present the game to the Forest and Bird Protection Society with an accompanying evaluation sheet. |  |