Home Learning TV – Middle science

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| **Segment lesson planning details** |  |
| Title for segment: | Biosecurity and our farms |
| Year levels *(e.g. Yrs1 – 3)*: | Middle |
| NZC learning areas/ KCs: | science/managing self |
| Purpose of lesson:  (What learners will learn based on the above) | Introduce biosecurity and use the white butterfly, pepe mā, as an example of an introduced pest  Build a sense of community responsibility for protecting Aotearoa |
| Success Criteria – students will be able to:  (how they will know when they have learnt it) | * give an example of an introduced species and the problems it causes – pepe mā * explain why border security is so important, and what we can do! |

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| **Segment content/context details *(describe)*** | | | |
| Māori content/context: | Kaitiakitanga | Pasifika content/context: | connection to how to protect an island |
| Learning Support content/context: | Multiple links to everyday experiences; images and video to provide visual support for conceptual learning | Other (specify): |  |

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| **Segment production details** | | | | | |
| Teacher talking time: | 22 minutes, including videos | | Studio requirements: | White board and pens; screen for images/video | |
| Equipment requirements: | Bowl of vegetables/fruit as a prop | | | | |
| **Segment links and attachments *(list all links to recordings or attachments, the source and confirm that copyright permissions are granted)*** | | | | | |
| Links to recordings /resources |  | | | | |
| Attachments |  | | | | |
| **Segment plan content** | | | | | |
| Stage | Teaching strategies linked to purpose | Learning tasks and activities | | | High level script (key points/questions for presenter) |
| **Beginning of lesson:**  Activating prior learning and relationships | Connecting with the audience and making connections with previous episodes/topics. |  | | | Kia ora - [greeting in languages of your choice]  [Touch base with audience if they’ve sent in texts or emails.] While I’m showing you the cool messages I’ve received, check that you’ve got your science journal, or some paper and something to write with.  Remember - if you want to share your ideas or learning with me, text 5811 or email [info@hltv.co.nz](mailto:info@hltv.co.nz). The keyword for this episode is biosecurity or tiakitanga pūtaiao.  [on screen: text 5811 or email [info@hltv.co.nz](mailto:info@hltv.co.nz)  keyword: biosecurity or tiakitanga pūtaiao] |
|  | Introducing the context for the episode - farming keeps food on our tables. | Connecting with the theme ‘biosecurity’ through everyday experiences of kai                                  Thinking about what ‘biosecurity’ means    Visual references that many students will be familiar with.  **Filename: VID\_03\_ biosecurity whole.mov**  **Vimeo link:** <https://vimeo.com/415365876> | | | Have you wondered where your kai, your food, comes from? Maybe you have a vegetable garden at home or some fruit trees? Or maybe you live on a farm?  [Assortment of veges and fruit as prop - great if these have been home grown - Presenter to share an anecdote about his garden, perhaps some photos …]  Aotearoa produces a lot of food - and such wonderful food that there is a big demand for it from all over the world.  But what if something stopped us from producing some of that kai? In this episode we are going to thinking about **biosecurity**.  [on screen - Biosecurity - tiakitanga pūtaiao  Check <https://maoridictionary.co.nz/> for pronunciation support]    Bio and security….    Write down the start of the word - bio  I know that biology also starts with bio - so this tells us the word has something to do with living things.    Write down the rest of the word - security. Security means keeping things safe - we can all think of movies that have security guards in them. Maybe you even know a security guard?    So biosecurity is something about keeping the biological systems in Aotearoa safe.    Let’s see why it’s so important. While you watch, think about the ideas you already know about, and ideas that are new to you.    [play video\_03 - 1:07 minutes] |
| **Main part of lesson (a)** | Introducing biosecurity as the episode’s key concept  Introducing the white cabbage butterfly as the context for learning about biosecurity. | Identifying why biosecurity is important.                                  Identifying familiar (and possibly new) species as native or introduced.                **Filename: CollageNativeSpeciesAndPests.jpg**    A collage of photos of pests and native species  KEY Filename: **CollageNativeCrittersAndPests\_Key.jpeg**  https://lh6.googleusercontent.com/Xv_mOmEBbxdFE9xQpLTQOq3p7DiEBpHAyVTjkqyFpmG4ys9n6Z5nEqsqkTlHn0vvsbhY-gY3OQpMdpuDRccr9qRyG34tBEUAFFbjJpymmM0mi23BU-svLCXxn2uhqw      **Filename: BFY\_LKC\_ART\_03\_White\_Butterfly\_CCBY20.jpg**    Practice interpreting representations - a science capability            **Filename: OSC\_ART\_20\_The\_Pieris\_Project\_Routes\_of\_invasion.png**    <https://www.sciencelearn.org.nz/images/4017-the-pieris-project>                            **Filename: CabbageButterflyPupa\_123RFLtd\_105258848\_m.jpg**            **Filename: BFY\_LKC\_ART\_03\_white\_leaf\_damage\_due\_to\_a\_white\_butterfly.jpeg**  <https://www.sciencelearn.org.nz/images/777-leaf-damage-due-to-white-butterfly-larvae> | | | Wow, what a great introduction for this lesson!    What ideas were new to you?  If you’ve ever come into Aotearoa from overseas, you would have seen the dogs and all the checks at the airport. Or maybe you’ve seen them on TV programmes like ‘Border Patrol.’    Did you notice the images of big containers arriving at our ports? Those also need to be carefully checked.    It’s a huge job, isn’t it. But such an important one - because the arrival of new biological organisms into our country can cause massive problems for our natural environments, and for our farming and horticultural industries.    Have a look at this group of photos. Can you point out which animals are native - this means that they live here naturally - and the animals that are pests? some of them might be familiar and some maybe not - that’s ok.  Scan them quickly and count the number that you think are introduced. Tell someone you’re watching this with, or write your number down.    [point and identify them by name - the key is provided as a separate image]    [Presenter chats about each image - along the lines of  We all know that possums - those cute fluffy animals are pests - they eat our native trees and birds!  Introduce the others, then add up which ones are introduced - white cabbage butterfly, rabbit, possum, wasp, introduced earthworms]    Not all introduced species become pests - the tiger worms aren’t - but most of them do!    What about the cabbage butterfly, or white butterfly - pepe mā?  Lots of us really like butterflies.  But if you have a vegetable garden then these white butterflies are not your friend! They are a riha - a pest! Write the word riha or pest in your journal and draw a quick sketch of a white butterfly.      I also want you to look closely with me at this image. Did you tune into our episode about moths and butterflies? Can you see the antennae on this one? Remember that the expanded knobs is a distinguishing feature of butterflies, and tell us that this is not a moth!    The white butterfly is actually native to European and Asian countries - countries that are a long way away from Aotearoa! Have a look at this map [show image]. All those dots show where the white butterfly is found around the world.  How do you think white butterflies got here? Did they fly all the way? Or did they hitch a ride?  Like a lot of our pest species, white butterflies most likely hitched a ride! Aotearoa imports a huge range of items that arrive from overseas - including fruits and vegetables.  White butterflies were first seen in Aotearoa in 1929. They eat plants like cabbage and broccoli - a group of plants called brassicas - and because of this they were able to spread very quickly - from veggie patch to veggie patch.  In fact within 2 years after the first recorded sighting of a white butterfly in Napier, it had spread up to 200km, moving to wherever brassica crops were planted. They then crossed mountain ranges and dense forests on the wing - can you imagine being a small butterfly flying across those massive mountains? Whew, I’m tired just thinking about it!  Of course they were helped to the South Island by hitching another ride on vegetables being shipped from the Te Ika-a-Māui, the North Island to Te Wai Pounamu, the South Island.    By 1935 - that’s less than ten years! - the white butterfly was well established throughout the country. The absence of natural enemies allowed the species’ numbers to explode.  You may remember learning about the life cycle of butterflies in a previous lesson. [Briefly draw this on the white board.]  Well the white butterfly pupae are pretty special. Here’s a photo of a pupa. First of all, they are camouflaged - they are pretty hard to spot on green leaves.  White butteflies, pepe mā - also have another super-power - the pupae can suspend their growth when conditions get too harsh. For example, if there is a heat wave or even a snow storm, they just stop growing!  Amazing aye! Scientists call this diapause. The white butterfly pupae in diapause could have survived for a long time on vegetables transported in refrigerated ships.  So you may be thinking - why are we talking about the white butterfly? How much damage do they really do?  Well it is not the butterfly that does the damage - it is the white butterfly larvae - the caterpillars that feed on the leaves.  Check out the damage the caterpillars have done to this broccoli leaf.  [Show image] It looks really damaged doesn't it - not much of the leaf left after the caterpillars’ lunching and munching!  Hey - you could add a quick drawing of this to your page about pests.  Pests like the white butterfly have the potential to destroy crops and reduce how much food we are able to produce.  Hmm. If te pepe mā were first spotted in 1929, and it’s now 2020 - how long ago was that? Can you work it out with me?  [Counting 1929 - 1939 - 1949 …. etc. - so 91 years!] And it’s STILL going strong! |
| **Main part of lesson (b)** | Revisiting the concept of biosecurity and highlighting its importance. | Reviewing ideas introduced earlier by re-watching some of the video.  **Filename: VID\_03\_ biosecurity 5sec.mov**  **Vimeo link:** [**https://vimeo.com/415017714**](https://vimeo.com/415017714) | | | This is why biosecurity is so important.  Do you remember the first video we watched earlier? Let’s remind ourselves of some of the key messages  [Show video - ]    What were some of the checks you saw in that video? Where were they? At the airport and checking containers and bags coming into the country.  Hmm - I saw someone checking some shoes - what would they be looking for? If a white butterfly larvae can come in hidden on a cabbage leaf - then what pests could come in on soil from another country? Or on a piece of fruit?  Yep - taking care not to bring food or dirty camping gear into the country is one way we can protect our farms.    Border security agents also check cargo that is shipped here. Believe it or not, butterflies like to hitch a ride on all kinds of things. A while back, a Japanese swallowtail butterfly was found near some cars that had been imported from Japan.  What do you think might have happened?  Yep, experts think a pupa arrived undetected in a car and then emerged as a butterfly.    It’s a difficult job keeping our borders safe - but a hugely important one!.    And we’re part of that - we need to be responsible when we return to Aotearoa from overseas.    Over the last few months we’ve also ALL been helping to protect Aotearoa against another awful invader - coronavirus.    Stopping pests - and deadly diseases - coming into our country is really important! |
| **End of lesson:**  Learner and parent reflection on learning and engagement and what they can do next | Summary of lesson  Opportunities for further learning | **Filename: VID\_02\_Pawder control**  **Vimeo Link:** [**https://vimeo.com/415017700**](https://vimeo.com/415017700)  <https://www.youtube.com/watch?v=1zZv9O7Y60k>  **Filename: Ko Tātou This Is Us - Protecting New Zealand takes everyone.mp4**  **Vimeo link: https://vimeo.com/415362171**  <https://www.youtube.com/watch?time_continue=30&v=5lqvHsHAWP8&feature=emb_logo> | | | As we come towards the end of our time together today, let’s give a shout out to all who are working in biosecurity - including our biosecurity dogs!  [Optional, depending on time and presenter’s other anecdotes - video - Pawder Control - introducing Officer GoodBoy]  Caring for our country is part of being a good New Zealand citizen, and we all have a role to play!  [Show video - **Ko Tātou This Is Us - 1:00 minutes]**  I can’t put it any better than that, and I’m not going to try!    If you’d like to get in touch ...  [on screen: text 5811 or email [info@hltv.co.nz](mailto:info@hltv.co.nz)  keyword: tiakitanga pūtaiao or biosecurity]  [Shout out to the Science Learning Hub for support planning this episode]    [Sign off in various languages] |