Home Learning TV: Middle Science

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| **Segment lesson planning details** |  |
| Title for segment: | Biosecurity and our ngahere |
| Year levels *(e.g. Yrs1 – 3)*: | years 4 - 6 |
| NZC learning areas/ KCs:  | Science |
| Purpose of lesson:(What learners will learn based on the above) | Students explore biosecurity measures needed to protect our native ngahere (bush, forest) in particular Kauri |
| Success Criteria – students will be able to:(how they will know when they have learnt it) | * explain why kauri are taonga
* identify some symptoms of kauri dieback disease
* describe how we can all help to be kaitiaki of our ngahere
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| **Segment content/context details *(describe)*** |
| Māori content/context: | Legend of Rātā and te Rākau, links between Mātauranga Māori and Western Science through the Project Mātauranga video, kaitiakitanga | Pasifika content/context: |  |
| Learning Support content/context: | Use of images to aid visualisation/understanding of concepts | Other (specify): | References to everyday experiences, opportunities for taking action |
| **Segment production details** |
| Teacher talking time: | 16 minutes plus video times | Studio requirements: | White board and pens; screen for images/video |
| Equipment requirements: | Running shoes / tramping boots and a brush to clean them with |
| **Segment links and attachments *(list all links to recordings or attachments, the source and confirm that copyright permissions are granted)*** |
| Links to recordings /resources | <http://instructionalseries.tki.org.nz/Instructional-Series/Junior-Journal/Junior-Journal-57-Level-2-2018/Rata-me-te-Rakau> |
| 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 multiple languages][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. The keyword for this episode is kauri.[on screen: text 5811 or email info@hltv.co.nzkeyword: kauri] |
|  | Introducing the context for the episode | Using images to anchor the talking; students practise being careful observersFilename: **Kauri Trunk1.jpg**Filename: **Kauri Trunk2.jpg** | We often start our science with an image to get us thinking. Have a look at this image. [Show image - Kauri Trunk1]What do you notice? You might like to sketch or do some writing in your science journal.I’m going to record my observations over here. When scientists make observations they look at things like size, colour, shape. If we had the real thing we could feel it. Touch is an important sense in science too, but as we only have an image today, we can only use our sense of sight.Looking at this image, what do you notice? I am noticing that there’s something green in the background, and something grey and brown in the foreground. The bit in the foreground has horizontal lines that don’t go all the way around, and the speckled pattern on what I think is a tree trunk. Did you notice that I said what I **think i**s a tree trunk? Scientists often use tentative language like that, until they know something for sure. How would we know for sure what this is? If we could see more of it, it would help? Perhaps if we talked to the person who took the photo. Or we could compare it with other photos where there’s more of the feature showing. Let's have a look at the next image.[Show image - Kauri Trunk2]This is similar, but I notice that there is a bit of a lump in the middle that looks to be a bit cup shaped. The other image had straight lines. I wonder if that cup shape is important or significant? |
| **Main part of lesson (a)**  | Linking to Origin narratives to highlight te ngahere and kauri as taonga[For the Journal article source, see <http://instructionalseries.tki.org.nz/Instructional-Series/Junior-Journal/Junior-Journal-57-Level-2-2018/Rata-me-te-Rakau>]Please check <https://maoridictionary.co.nz/> for any pronunciation support, including pronunciation of ‘kauri’Introducing key features of kauri trees | Listen to a pūrakau that highlights the importance of respect for our natural environment. Images connect students with the narrativeFilename: **RataChoppingDownTree.jpeg**Filename: **BuffRataCuttingDownTree\_andrew-burdan.jpg**PERMISSION STILL TO BE CONFIRMED<https://www.careers.govt.nz/resources/tools-and-activities/the-magic-of-myths/rata-and-the-treerata-me-te-rakau/rata-and-the-tree/> **RataAndTheTree\_Conclusion.jpeg** Students connect with the concepts through the images that are provided.Filename: **KAURI\_ART\_KauriDiebackMātaurangaMāori\_Tane\_Mahuta.jpg**<https://www.sciencelearn.org.nz/images/4144-tane-mahuta>Filename: **KauriStagesOfGrowth.jpg**<https://teara.govt.nz/en/artwork/10022/stages-of-growth>Filename: **EarlySettlersAndFelledKauri.jpg** | Now, I know the person who took these photos, and she told me they are of the trunk of a kauri tree at different heights on the trunk.She knew this because she can identify kauri trees. This tree lives in te ngahere, or forest, and like te ngahere, it is a taonga or treasure - and it is one that we need to respect and care for.I want to start by sharing a legend of Rātā and the Rākau. Rātā went into the forest to search for a nice straight tree with which to make a waka. The waka would be needed in the battle between Tāwhirimātea and Tangaroa. Rata searched for many days before finding the ideal rākau [tree].He set to work straight away. Wētā and Kārearea, (**falcon**) were horrified. No karakia had been said to bless the gift of the tree, and no respect had been shown. The creatures of the forest cried out but Rātā couldn’t hear them above his chopping. As the sun set, the tree came crashing down. Rātā looked satisfied with his work and decided he would rest for the night before carving the waka the next day. On returning the next day, he couldn’t believe his eyes, the tree was upright again! Had he dreamt that he had cut the tree down? The blisters on his hand said otherwise. Again, he felled the tree, and the next morning again the tree was upright. For the third time he chopped the tree down, but instead of returning to his camp he hid and watched. Rātā gazed in astonishment as all the creatures put the tree back together again.In anger Rātā leapt out and cried, “Why do you ruin all my work and make fun of me?” The creatures all replied, “Us? make fun of you? We wondered why you mock Tāne-mahuta by not showing him and this rākau respect.”Rātā was ashamed. He hadn’t shared why he needed the tree. He apologised, he explained how worried he was that without this waka his people would all perish in the war between Tāwhirimatea and Tangaroa. In deep embarrassment he returned to his village and awoke the next day to see a giant waka flying towards him borne by the creatures of the forest. Wētā spoke to him, “We could see your heart was true so please take this waka as a gift and in return we ask that you and all of your people always show respect to Tāne mahuta.” Rātā gladly agreed.That’s a pretty special story, isn’t it? What does it make you think of?What do you think its message is? Quickly share some ideas with those watching this with you, or do a drawing. For me, one of the important messages is that all the animals dwelling in the ngahere wanted Rātā to care for and look after the ngahere. And they need us to look after the ngahere, too!So today we are going to be thinking about how we can show respect for and care for te ngāhere - the forest.In Aotearoa the kauri tree is known as the King of the forest, and our largest kauri is called Tāne Mahuta, or God of the Forest.Tāne Mahuta is our most famous tree. [Show image}I wonder if any of you have been lucky enough to visit Tāne Mahuta in the Waipoua Forest in Northland? Tāne Mahuta is the protector of the other trees in the forest, he is the tuakana. And he’s huge - his girth is 15 metres. Stand up and stretch our your arms. Do you think they’re about a metre across? So to get around Tāne Mahuta’s girth, we’d need 15 of us to be standing holding hands with our arms outstretched?Tāne Mahuta is the largest kauri tree alive today, and he’s estimated to be between 1,500 and 2,500 years old! Wow! If Tāne Mahuta was talking to you, what stories do you think he might tell? What messages might he have? In general, kauri trees are some of the largest, longest living trees in the world. That’s pretty special!When full-grown, their branches reach above the other trees in our bush. Towering over the others, the kauri is known as a canopy tree - it grows to form a canopy that protects and sometimes overshadows the smaller trees, kind of like an umbrella or roof. Have you ever seen a kauri tree? How old did you think it was? Could you wrap your arms around it? Was it a ‘teenage’ kauri? They’re called rickers.Here is a diagram of the different shapes of the kauri tree growth. [Show image]Sometimes scientists use diagrams rather than photographs because certain features can be highlighted to help inform people. What do you see looking at these three different kauri trees?Talk about it with someone, or maybe do a quick drawing.For example, can you see that at each stage the trees look different? The young tree is a different shape and structure to the ricker, which has shed its lower branches. This can take about 50 years! The name ‘ricket’ comes from the part of a ship that they were once logged for.The mature kauri has a long straight trunk with a crown of branches and leaves, and an intricate network of roots to anchor it. Early pakeha settlers loved the straight, clean shape of its trunk and many kauri were felled to build houses, boats and furniture.[Show image and make a comment.]In fact, the settlers loved the kauri too much and far too many of these immense trees were felled. To help protect these giants of the forest, many forests and individual trees are now protected from being felled. |
| **Main part of lesson (b)** | Making connections between Mātauranga Māori and attitudes that are valuable still today. [See <https://www.sciencelearn.org.nz/videos/902-kauri-dieback-death-in-the-ngahere> for the full video, as presenter background]Thinking about the impacts of kauri dyingLearning about kauri dieback diseaseUsing everyday experiences to identify possible courses of actionMeeting a scientist to learn more about kauri dieback diseaseRecalling earlier thinkingFinding connections between COVID experiences of containment with containment of kauri diebackIdentifying ways in which we can all be responsible citizens and kaitiaki (belonging and contributing) | Videos help students understand the concerns about kauri dieback, and how we can all help. The umbrella analogy helps students understand the protective, sheltering role of kauri. Filename: **SV0959a Ngahere subclip A.mov**Vimeo link: <https://vimeo.com/414977868>Filename: **SV0959b Ngahere subclip B.mov**Vimeo link: <https://vimeo.com/414977898>Drawing on everyday experiencesFilename: **SV0959c Ngahere subclip C.mov**Vimeo link: <https://vimeo.com/414977923>Video gives windows into a scientific world.Linking to everyday experiences and using these to understand new terms. Recalling earlier thinkingFilename: **Kauri Trunk2.jpg**Filename: **SV0959d Ngahere subclip D.mov**Vimeo link: <https://vimeo.com/414977946>Recalling earlier thinkingFilename: **Kauri Trunk2.jpg**Creating an emotional connection. Making connections between treating human illness, and treating kauri dieback; the table helps to summarise ideas.Filename: **SV0959e Ngahere subclip E.mov**Vimeo link: <https://vimeo.com/414977990>Filename: **SV0959f Ngahere subclip F.mov**Vimeo link:<https://vimeo.com/414978024>[4](https://vimeo.com/414978024) | Today, there is a new threat to the kauri. Have you heard of kauri dieback disease? Let’s write that in our journals [Show ‘Kauri dieback disease’ on the screen] We’re going to watch some video clips to help us learn more. These video clips come from an episode of Project Mātauranga, a television series. While we watch this first video, I want you to listen to why kauri are so important. [Watch video - Ngahere subclip A - 0:52 minutes]What did you notice about why kauri are so important? Did you hear Ian talking about their protective role, and the shelter they provide? That’s because of the canopy formed by their high branches and leaves - a bit like a roof, or umbrella over the ngahere or forest. And an umbrella or roof gets taken away, what happens to us?· We get sunburnt,· We get wet· We get blown aroundAnd having sudden changes, like getting too much sun or being battered by strong winds will definitely be a problem for the plants growing underneath the canopy. So what is this kauri dieback? Is someone cutting it back, or what is happening and how is it a problem for the kauri tree? Let’s watch another short video. This one has got a lot of scientific words in them - listen out for these, and we’ll talk about them afterwards.[Show video - 0:36 minutes]So what did we learn?[Words on screen, supported by the presenter’s explanation:***Phytophthora taxon agathis* (PTA)**- the scientific name of the disease**Microscopic** - tiny, invisible to our eyes without a microscope**Lesions** - wounds, damage**Foliage** - leaves**Kauri are killed by kauri dieback**][For the presenter - the video transcript is: Kauri dieback, also known as Phytophthora taxon agathis or PTA, is a microscopic plant disease spread through soil. The disease, which infects kauri through its roots, causes lesions on the trunk and yellowing of the foliage. Every kauri that contracts the disease is eventually killed.]Gosh that sounds like the kauri is in a lot of serious trouble! If every kauri that is infected is eventually killed that means that ALL of our kauri could be killed.Ok, let’s grab our journals. What ways do you think we might be able to help our precious forest kings? If you don’t feel like writing, maybe you can tell someone the ideas you have. Here are my ideas:[Summarising in a table on the white board, as suggested below]If we are sick we go to the doctor and they can do two things; [presenter to pause to enable students to think and jot and presenter could discuss their thinking before jotting on white board] they can give us stuff to make us feel better while our bodies fight off the illness, like paracetamol, or they give us medicine like antibiotics that will kill the disease.What else can we do? Well, lately we have been working really hard to make sure that we all don’t get sick by keeping away from people who could be sick.And at the moment scientists are working really hard to try and find ways to protect us from coronavirus - they’re working on developing a vaccine.

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| Humans | Medicine to help me feel better- like paracetamol | Medicine to kill the bugs like antibiotics | Stay away from other sick people | Develop a vaccination to stop people getting sick |
|   |   |   |   |   |

 I wonder if any of those ideas would be good for scientists to try in order to save the kauri?Part of the problem is that *Phytophthora* is a microscopic disease that is too small for our eyes to see, and it lives in soil. Obviously, we can’t take all the soil away from kauri - that would kill them too!Let’s meet one of our scientists who is working on finding ways to help fight kauri dieback disease, Dr Stanley Bellgard. He’s going to teach us about a bioassay[Term of screen: bioassay]Bioassay - that’s a test of how concentrated something biological is, or how effective it is against biological tissue.][Show video - Ngahere subclip C - 1:43]So that’s interesting - Dr Stanley talked about ‘bait tissue’[Words on screen: Bait tissue’]What does ‘bait’ make you think about? I’m sure lots of you know!That’s right, we use bait to attract fish when we’re fishing. To detect kauri dieback in soil, kauri tissue is placed in the soil like bait, and then it’s examined under a microscope for evidence of *Phytophthora.*This video helps us to understand part of the problem - the disease is microscopic, and it lives in the soil. As we look at the next video, think about this image that started with. [Show image - Kauri Trunk2].Do you remember that we commented on the odd shape in the middle? While we watch this next clip, try to listen for what this might be called. You’ll also learn about how sad this disease is. [Show video - Ngahere subclip D - 2:48 minutes]Do you remember what Ian called these marks on the trunk? [Show image again]He called it **gum bleedin**g - the tree trying to get rid of the disease. And when he talked about the trees dying, he was obviously deeply affected.How did it make you feel, listening to him? Do you feel sad for our kauri trees?Let’s have another look at our table that we started. We thought about what we do as humans when we are sick. Let’s add another line to our table and see what the scientists are doing using similar ideas for the kauri.Currently, there isn’t a cure for kauri dieback - and it can be spread by even a pinprick of soil. One of the most important things that scientists are currently encouraging is containment - that’s a bit like we’ve all been doing here in Aotearoa, to contain COVID - we’ve been working to stop its spread.

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| Humans | Medicine to help me feel better- like paracetamol | Medicine to kill the bugs like antibiotics | Stay away from other sick people | Develop a vaccination to stop people getting sick |
| Aotearoa Kauri tree |   |   | Keep the disease contained [ADD A BIG STAR HERE] |  |

 And containment of kauri dieback disease means working together to not spread the *Phytophthora* to other parts of our ngahere. [Show video - Ngahere subclip E - 1:29 minutes]So Ian is talking about containing the disease? He talked about wanting to prevent the movement of soil. What sorts of ideas do you have about how to do that? Let’s have a look - [Show video - Ngahere subclip F – 1:47 minutes]So what are we being asked to do? What do we all NEED to do?That’s right, we need to use the cleaning stations, and work together to help stop the spread of this disease![Presenter could model cleaning some running shoes with a large brush, as in the video?] |
| **End of lesson:**Learner and parent reflection on learning and engagement and what they can do next | Summary of lessonOpportunities for further learning | Revising key learningsFilename: **KauriDieback\_TrunkScreenGrab.jpeg**Filename: **TreatingTheDisease\_ConnectedJournal.jpeg**<https://docs.google.com/presentation/d/1oHWYybSevXt0qiSb5WpRFOhGwynNyZ6YMHMLCVmHXfA/present?slide=id.g18337276d7_0_65> | As we come to the end of our episode let’s remind ourselves of some of the symptoms of kauri dieback. Which symptoms can you remember? Count up how many you can think of on your fingers. Here’s a clue for one of them.[Show image]How many did you get? Let’s look at this summary image. It’s got four symptoms.[Show image, and briefly summarise]Kauri dieback disease is killing our trees, and that’s really sad. It’s also very worrying.While scientists continue to look for a cure, we can help by being responsible citizens when we visit te ngahere.One of the important things we can do is use the cleaning stations if we see them, and encourage others to use them, too.Hey - maybe you’d like to design a poster that would help encourage visitors to te ngahere to do this? Maybe you could write a poem or waiata.If you do, I’d love you to send me what you’ve done! Your ideas could help all of us act as kaitiaki for our kings of the forest, the kauri. Contact me, or share your ideas with your teacher or kaiako.[on screen: text 5811 or email info@hltv.co.nzkeyword: kauri][Shout out to the Science Learning Hub for support planning this episode]Ka kite ano. |