NZ Geographic Together at Home – the 107 science ones

<https://www.nzgeo.com/together-at-home/>

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#1 Rowi - Rarest of the rare

Rowi are the rarest of the rare—a species of kiwi so critically restricted in distribution and breeding success that they were almost done for. But a last-ditch effort—codenamed Operation Nest Egg—has dramatically changed the fortunes of the most imperilled kiwi in the world.

<https://www.nzgeo.com/stories/rarest-of-the-rare>   
***For younger readers*:** If you're finding the story tricky, just look at the pictures and figure out what story the photographer is trying to tell.

*Talking points::* Discuss this story with your family, and use the talking points below to involve younger readers too.

* Why do you think we should try to save the rowi?
* What are some of the biggest challenges?
* If you were able to name a rowi chick, what would you call it?

*Task for the day:* Find some leaves outside and stick them together into the shape of a rowi on a piece of paper with some tape or glue. This is your opportunity to name it!

# #2 Skinks & Geckos - Lizards anonymous

Many of our skinks and geckos are so new to science that they don’t even have names. Much of what we do know about our lizards is thanks to an amateur herpetologist from Invercargill with no academic training.  <https://www.nzgeo.com/stories/lizards-anonymous/>   
***For younger readers*:** If you're finding the story tricky, just look at the pictures and figure out what story the photographer is trying to tell.

*Talking points:* Try discussing these ideas with your family at home. Find ways to involve as many people as possible, especially those who you know are isolated by the lock-down.

* What do you notice about the interesting body parts on the geckos in the story?  (Such as toes, eyes, mouths and ears.)
* Why do you think these geckos are coloured the way they are?  How would it help them?
* What do you notice about the people looking for lizards in the pictures.  Does it look like a job you would like to do? Why or why not?  
  What are some of the ways we can help lizards?

*Task for the day:* Go outside and look around your garden to see how lizard-friendly it is. Can lizards hide in your garden?  Are there invertebrates and fruit for it to eat?  Use [this DOC website](https://www.doc.govt.nz/get-involved/conservation-activities/attract-lizards-to-your-garden/) to help you learn about what lizards need.  Did you know you can build a lizard habitat yourself! Loosely arrange bricks, wood and anything like broken pieces of concrete into a pile. Cover with corrugated iron or a piece of wood if you have any. Build it in a safe, quiet corner—on a fence-line works well. If you have more time, do your own drawing of two geckos.

#3 Stewart Island!

Little Blue Penguins run the gauntlet to escape great white sharks—but they’re not the only species flirting with death on New Zealand’s famous Stewart Island. <https://www.nzgeo.com/video/stewart-island>

*Talking points*: Try discussing these ideas

* How did various animals use colour to help escape predators?
* Which animal did you think was the most beautiful? Which one made you feel the most sorry for it? Why?
* What was one thing that surprised you? What was surprising about it?
* Can you remember why the forest on the shoreline had an impact on the sea creatures?
* Do any of these creatures live on the land or sea near your place? Which ones? What makes Rakiura/Stewart Island a great home for so many animals?

*Task for the day:* Make an eleven-armed starfish out of clay! Use air-dry clay or make salt-dough [using this recipe](https://admin.nzgeo.com/sendy/l/MCl1Cb6uTrALboxBSKejAQ/uGJLJyOXonWsYV6NdWEjGA/ymbRLxkJcmGOaGSqZxhm892g) with salt, flour and water to sculpt a starfish. (Eleven-armed starfish actually have between 7 and 14 arms, although 11 is the most common number, so you can choose how many arms yours has.) Starfish have no eyes or head and they move around by using little tubes underneath the body. The top of the body is covered with tiny spines which are used to catch food and defend from predators. Add some in if you can!

#4 Kākāpō – bird on the brink

In a land renowned for its unusual birds, the kākāpō—a giant flightless nocturnal parrot with a bizarre breeding system—has to be one of the strangest. Although it has been lingering perilously close to extinction for the past half century, there is renewed hope that this icon of conservation effort has a future after all. <https://www.nzgeo.com/stories/kakapo-bird-on-the-brink>

*Talking points:* Try discussing these ideas

* In the picture of the kākāpō's island habitat, what do you notice about the places that are considered safest for them?
* Kākāpō were once found all over Aotearoa. Can you imagine having kākāpō in your back yard? Maybe a thousand years ago, they did live in forest where your house is now!
* Would you let a kākāpō climb all over you?
* Why do you think kākāpō smell of fruit?
* Are you impressed with how well the kākāpō camouflages with the forest floor?
* What do you think the scientists are doing with the technology in the pictures? How might it be helpful?

# *Task for the day:* Kākāpō are vegetarian. They eat leaves, flowers, fern fronds, bark, roots, bulbs and seeds. Just like most humans, they also really enjoy fruit.

1. How much vegetarian food would a bird find in your garden? Take a walk and count up how many sources of fruit, berries, seeds, fern shoots and other avian snacks are growing. Is your garden a bird's paradise?

2. Can you get a photo of a bird foraging in your garden? Send, or write a sentence about which bird you spotted and what they were eating!

# *Get creative:* Colour in [this template](https://images.nzgeo.com/2020/03/SarahLittle-1414x2000.jpeg) of a kākāpō by kindly shared with us by kākāpō ranger Sarah Little (click the image, left, to get a big version you can print out, or colour in on your device). We'd love to see your hard work when it is finished

#5 Goat Island - The world's first marine reserve

The creatures of NZ’s oldest marine reserve are safe from humans, but that doesn’t mean life is easy. They are under constant attack from marauding dolphins, diving cormorants, and the sharks and the marlin that live beyond the boundaries of the reserve.  <https://www.nzgeo.com/video/goat-island>

# *Talking points:* Discuss the ideas presented in the video

* What were some of your favourite moments in this documentary?
* Did you know that crayfish have become very rare outside of marine reserves? Why do you think that is?
* Why do you think all the female crayfish release their eggs at the same time, and just before sunrise?
* Why do you think kina and crayfish release millions of eggs each?
* What might the kelp and seaweed forests be helpful to the fish in the reserve?
* Why do you think the fish return again and again to Goat Island?

# *Task for the day*: Ask your parents for a bar of soap. It's important not to waste it—you can use the soap boat and collect all the trimmings for later.

Draw around the bar of soap on light cardboard. Draw the shape of a boat on the cardboard. Cut this out and lay it on the soap as a pattern. Use a kebab stick, skewer or something sharp-ish to etch around the pattern. Ask to use a knife from the cutlery drawer (it doesn't need to be sharp) and cut the soap away until it is the right shape. Smooth the edges by paring with the knife—peel away from yourself. Dig out a central cavity if you want to.

You can make a boat out of lots of things—even a walnut. (The one in the picture has a toothpick mast and a sail and sailor made from beeswax clay.) So if you don't have soap, see what else you can make a boat out of—the lid of a jar, the right-shaped leaf, hollow out half an apple.

#7 Bumble Bee - In search of a better bee

Unaffected by Varroa, tolerant of cold and able to pollinate in enclosed spaces, bumblebees offer new hope for New Zealand’s primary industries. If only we knew how to build a nest they wanted to live in. <https://www.nzgeo.com/stories/in-search-of-a-better-bee>

If younger readers find the story tricky, just look at the pictures and try to figure out the story the photographer is trying to tell—the captions help!

*Talking points:* Discuss the ideas presented in the bumblebee story with your family—at home or over video conferencing. Find ways to involve as many people as possible, especially those who you know are isolated by the lock-down.

* Did you know that bumblebees don't make honey?  They do work very hard though—why are they so valuable to orchardists and growers?
* Do you find bumblebees less scary than other bees? Why or why not?
* What do queen bumblebees need to make a nest?
* Bumblebees are almost constantly in need of food because their bodies are so heavy, and they use up lots of energy buzzing to extract pollen. Is your street a good source of flowers, which provide food for bumblebees? Have a look around on your daily walk.
* Is there anything more you could do to make your street a haven for bumblebees?
* Have you ever wondered which flowers the bumblebee likes most? Can you find out by watching the flowers in your garden carefully?

# *Task for the day:* Make a watering station for bumblebees. Bumblebees all over New Zealand will be noticing the lack of water from our very dry summer. Make a safe place for them by placing some marbles or pebbles in a shallow dish, such as a saucer. Pour some water into the saucer, but don't submerge the pebbles. Bumblebees land on the pebbles and drink. Have some fun making it look more interesting or beautiful by adding some flowers, lichen, leaves or pottery animals, if you want to. You can also use seashells as a good watering station.

Place the watering station in a shaded or semi-shaded part of the garden and try to put it up off the ground (on a tree stump or wall or similar structure.) Make sure you change the water regularly so that it stays fresh.

# #8 Penguins - Life on the edge

Like New Zealanders, penguins occupy the margin of land and sea, being dependent on both habitats, and vulnerable to changes in either as well. Their fate is wedded to our coasts, and as scientists have begun to understand, they are a perfect indicator of the health of this fragile boundary too. What can penguins tell us about our seas and shores?

<https://www.nzgeo.com/stories/life-on-the-edge/>

If younger readers find the story tricky, just look at the pictures and try to figure out the story the photographer is trying to tell—the captions help!

*Talking points:* Discuss the ideas presented in the penguin story with your family—at home or over video conferencing. Find ways to involve as many people as possible, especially those who you know are isolated by the lock-down.

* The writer watches a penguin egg hatch. Are you surprised by how excited the parents are by their chick's arrival? What do you know about how penguin parents help each other to be parents?
* What do you notice about the difference between the chick's feathers and the adult's feathers? What might this be?
* What else do you see in the photos and the videos that shows the ways penguin's bodies help them on land and sea?
* The article describes tourists sitting and staring at penguins when they come ashore, not realising that they want to cross the beach to their nests. How do you think we could teach people to leave penguins alone? What else could we teach people about penguins?
* The map shows how much swimming penguins do between New Zealand and Antarctica. What does this show about the life of penguins? How might marine reserves in Antarctic waters affect penguins?

*Task:* Use the photo of penguins swimming as inspiration for a wax-resist picture that combines crayon and watercolour paint (or dye).

1. Start by creating a "horizon" line about 4/5 of the way up the page. Use blue crayons to colour heavily in patches here to give the impression of choppy water, like in the photo. Add some white if you want to.
2. Next, outline your penguins in black. Colour them in heavily in black and white. Look at their colouration in the photo to see where the black and white meet.
3. Colour in spots and patches of white for bubbles—especially the bubble trails created by the penguins.
4. Finally, make up some watercolour paint or dye in a deep blue and wash it over the whole painting. Where you have coloured in with crayon, the wax of the crayons will "resist" the watercolour and stay the original colour.

# *Creative writing:* Love writing? Imagine that you're a penguin entering the water for the first time and use this sentence starter to tell a story about your mind-blowing experience of the ocean: *I pushed down my fears for the last time and set my beak determinedly towards the water. I launched forward and closed my eyes. No going back now. Cold exploded around my body and brain but when I opened my eyes, I forgot it all.  Around me was...*

#9 Orca in Northland

As the tide rises in New Zealand’s Northland harbours, stingrays and eagle rays swim in to feast on shellfish. But they are not the top of the food chain. Only in New Zealand, and only in these harbours do Orca hunt rays. Trapped in the shallows, the rays breach the surface and swim for their lives, as the Orca pursue, with a highly evolved practice for avoiding the rays’ stinging tail.

As the tide ebbs, the underwater world of Northland’s mangroves surfaces and seethes. Twisted roots that moments ago sheltered fish are now exposed, a seafood platter for patient herons, spoonbills, and shags. <https://www.nzgeo.com/video/northland/>

*Talking points:* Discuss the ideas presented in the Northland video with your family—at home or over video conferencing. Find ways to involve as many people as possible, especially those who you know are isolated by the lock-down.

* What was the main risk facing the orca?
* We saw the pod of orca hunting as a team but they have also figured out some other smart ways to help each other. Did you notice any of these?
* Which animals of the ones you saw might eat some of the newly hatched baby octopi?
* Were you surprised by how much movement and life there was on the mudflats when the tide was out?
* How might a change in this ecosystem—like the Mediterranean fan worm that has established in some areas and competes for food with native mussels—have an effect on larger animals, further down the food chain?

# *Task for the day:* Use up some pictures from old magazines such as New Zealand Geographic or Forest & Bird to make cards for people. Cut around the outline of individual animals and glue them onto cardboard. Add captions or background if you want to.

# *In the kitchen:* Did you know that apples have a magic star in the middle? Chop an apple cross-ways instead of down the middle. Shake out the pips and reveal the star.

You can dehydrate apple rings by slicing them, laying them out on an oven try and baking them in the oven, on its lowest setting, overnight (you just need to leave the oven door open so that the moisture can escape as they dehydrate. To save electricity though, you can space the rings out on a stick and leave them to air-dry for 2–3 days. We propped our stick up between two jars on the bench and put a paper towel over the apple rings to keep any marauding flies or germs off. You can soak the rings in lemon juice before drying, to try to stop them oxidising (turning brown) if you want to.

#10 Great White Shark - Torpedo carnivore

Reaching more than 6 m in length with a bite force of nearly 2 tonnes, the great white shark is the most fearsome predator on Earth. Yet despite their reputation as man-eaters, great whites are protected in NZ as a vulnerable species. <https://www.nzgeo.com/stories/torpedo-carnivore-great-white-shark/>?

*Talking points:* Discuss the ideas presented in the shark story

* At the start of the article, we read about Mike Fraser losing his forearm to a great white shark. What did you think was interesting or surprising about the way this happened? Was it similar or different to your ideas about shark attacks?
* Are you surprised that only four people die, worldwide, from shark attacks in a typical year? Did you think sharks killed more people than this? Why do you think people are so afraid of sharks?
* Are you surprised by all the ways sharks are "attacked" by humans? Can you think of any more ways that we threaten sharks, which are not mentioned in the article?
* Did you know that sharks can detect electric currents, caused by even the tiniest movements of fish and conducted to the shark's sensitive skin through the salt water? How would having such acute powers of electro-reception help the great white stay at the top of the food chain?
* Do you feel any differently about sharks after reading this article?

# *Task for the day:* Go into the garden or look out a window, and sit or lie down somewhere comfortable. Make yourself as still as possible. For one minute, practice being as sensitive as a great white, noticing everything that is happening in the world around you and picking up information with all your senses.

**Your eyes** - what movement can you see? Leaves rustling? Sunlight glinting? Clouds moving? What else? (Anything surprising that you don't normally see?)  
**Your ears** - what noises can you hear? Listen as hard as you can?  
**Your nose** - what can you smell?  
**Touch and taste** - can you feel anything or taste anything?

After a minute (or more, if you can stay still) have a chat about which sense you think is the most important to you as a human. Are there any other ways you pick up information about the world around you that are not the main five senses?

# *Poetry challenge:* As this article says, we are fascinated by sharks because they are "charismatic mega-fauna". (That means interesting, and very large, animals.) Tigers are another type of charismatic megafauna. Poet William Blake wrote a poem about the tiger. Read it aloud—can you hear the way the words seem to "stalk" like a tiger because of the rhythm and rhyme?

**The Tyger** by William Blake

Tyger Tyger, burning bright, In the forests of the night;  
What immortal hand or eye, Could frame thy fearful symmetry?

In what distant deeps or skies. Burnt the fire of thine eyes?  
On what wings dare he aspire? What the hand, dare seize the fire?

And what shoulder, & what art, Could twist the sinews of thy heart?  
And when thy heart began to beat, What dread hand? & what dread feet?

What the hammer? what the chain, In what furnace was thy brain?  
What the anvil? what dread grasp, Dare its deadly terrors clasp!

When the stars threw down their spears And water'd heaven with their tears:  
Did he smile his work to see? Did he who made the Lamb make thee?

Tyger Tyger burning bright, In the forests of the night:  
What immortal hand or eye, Dare frame thy fearful symmetry?

Can you re-write Blake's poem, addressing the great white shark? Try this poem starter;  
Great shark! Great shark! swimming free In the...

#11 Lesser Short-tailed Bats - Bat signals

Nightfall, and the forest comes alive with squeaking. Or it used to. Lesser short-tailed bats are clinging on in a handful of places, their populations blinking out of existence. Yet researchers are only just beginning to learn about our bat species - NZ’s only native mammals - what they’re finding out is pretty weird. <https://www.nzgeo.com/stories/bat-signals/>

*Talking points:* Discuss the ideas presented in the story.

* In the top picture of a bat in flight, can you see the shape of the bones extending out from the shoulder? The article describes these as being like a human hand—in what ways do they look hand-like to you? How do they look different to a human hand?
* What texture or material does the membrane of the bat's wing look like to you? Why does this membrane look suitable to help the bat's lifestyle? Do you think bats would be better at flying than birds? Why or why not?
* Why do you think the writer takes a while to fully comprehend that bats are mammals?
* Did anything in this article make you laugh? What was it?
* Kākāpō and bats are both "lek" breeders; the males get together to attract females by making impressive noises. Can you think of any other characteristics these creatures have in common? Can you think of a common garden insect that is also a lek breeder?

*Task for the day:* Leonardo da Vinci found birds and bats fascinating. He studied their wings carefully to try to unlock the secrets of flight, hundreds of years before planes were successfully invented. Studying nature for technological inspiration is called bio-mimicry. Lots of great inventors spent their childhood as careful watchers of the natural world.

Making a leaf rubbing is a good way to study nature.

1. Place a piece of paper on top of a leaf. The leaf should be upside down so that the veins are bumpy.
2. Make sure you have a hard smooth surface such as a book underneath.
3. Rub a crayon over the paper. The veins and outline will show through clearly.
4. For best results, try not to move the paper while you are rubbing.
5. If you have some pointy leaves, try making a bat with "leaf" wings.

#12 Albatrosses - Freefall

Albatrosses are good omens for sailors, but are not having too much luck themselves. The population of female wandering albatrosses that nests on Antipodes Island has plummeted by two-thirds in the past 14 years. Read about their plight. <https://www.nzgeo.com/stories/freefall/>

*Talking points:* Discuss the ideas presented in the story

* What do you know about how longline fishing boats work?
* How do you think governments like the New Zealand government try to keep an eye on fishing boats and make sure they are doing the right thing? What might make this challenging?
* If you have a look at the graph that shows breeding pairs of albatrosses on Antipodes Island in 2003 and 2017, can you make a prediction about how many would be on a map in 203

# *Watch & Learn:* In this video by ocean conservation trust Live Ocean, two round the world sailors, Peter Burling and Blair Tuke, talk about how it felt to be sailing the rough Southern Ocean and see an albatross. How did this species impact them? Albatrosses have adapted so well to life far out at sea that they can actually drink sea water. A special gland removes the salt and it dribbles out of the big nostrils at the top of their beak. All their food is at sea so they only come to land once a year—for breeding. What kind of places do you think they might choose for nesting sites? Why? Check out the video. <https://www.nzgeo.com/video/antipodean-albatross/>

# *Task for the day*

Albatrosses have a wing span that can measure up to 3.1 metres. How big is 3 metres? A wee bit less than the length of a small car. Longer than two 12-year-olds. Draw some pavement art of an albatross in flight, with some chalk if you have some, or lined with leaves or stones. Try to make it about 3 metres from wing tip to wing tip.  (Take a tape measure outside if you want to be sure). Draw an outline of your own body beside the albatross.

#13 Antarctica - The long haul

Antarctica is a puzzle that science is racing to solve. The continent shifts from stable to unstable, frozen to melting, without much warning—and we don’t know why, or how. This switch hasn’t taken place in the century we’ve been observing it. But Antarctica has its own records that go back millennia, buried in the sea floor beneath hundreds of metres of ice. To retrieve them, a NZ-led expedition journeyed to the heart of the Ross Ice Shelf—[a featureless, inhospitable expanse the size of France.](https://admin.nzgeo.com/sendy/l/GU09fIA892apm892IijMbFfmRA/iO763js7892FAx9TcFGbTnl0Bw/69vL0763TeHA32FmD94SHbOw)

# <https://www.nzgeo.com/stories/the-long-haul/>

# *Talking points*: *Discuss* the ideas presented in the story

* What surprises you about the photo of the plane that takes people to Antarctica?
* There are 30 tents - one of them as large as a 4-bedroom house - in the tent village the scientists put up. Why do you think such a lot of infrastructure is needed to do science at the South Pole?
* "The ice sparkles in the sunlight, but the wind and temperature are brutal." Do you think you would enjoy visiting Antarctica? Would you rather go there as a tourist, or as a scientist who lives there for months at a time? Why?
* What do you think of the way the hot-water drill works - does it sound like a clever invention to you or would you drill another way?
* Why is it helpful for scientists to figure out how the Ross ice shelf is being affected by the water currents underneath?

# *Task for the day:* Make an ice wreath that sparkles in the sunlight and enjoy watching it melt!

1. Fill a ring cake tin with water. (Don't have a ring cake tin? Use any cake tin or any container—you will end up with a block of ice instead of a wreath.)
2. Walk around the garden (or the neighbourhood) and pick any small flowers or leaves that catch your eye.
3. Lay these in the cake tin so that they float in the water.
4. Place the cake tin in the freezer. Try to keep it flat so the water stays level.
5. Leave it overnight or for several hours until it is frozen solid.
6. Remove the solid ice wreath and hang it up somewhere to enjoy the sparkles. It will slowly melt.

#14 Kaikoura - Our Big Blue Backyard

NZ’s Kaikoura Peninsula is home to the world’s most acrobatic dolphin species, some of NZ’s most robust young fur seals, and an unconventional group of red-billed gull families who defend their chicks from dangers both within & outside the colony. <https://www.nzgeo.com/video/kaikoura/>

*Talking points:* Discuss the ideas presented in the video:

* We see dusky dolphins play "pass the seaweed", do acrobatics and sleep with only one half of their brain. Did you particularly enjoy watching any of these? Was there anything else you liked or disliked about the dolphins?
* The dolphins "commute" each day to the Kaikoura Canyon, which is 60km long and up to 1200m deep. The sides of this canyon are like underwater cliffs covered with plants. Which animals did you see making use of the plants?
* The Kaikoura ocean food chain starts with phytoplankton (tiny plants), which we saw being eaten by krill and squat lobster. What might come next? How many animals can you add?
* Were there any moments in the episode that you found a bit stressful or scary?
* If you were making orchestra music to show the kelp forest swaying in the currents, which instruments do you think you would use? Are there any instruments you wouldn't use? French composer Camille Saint-Saens tried to capture the sounds of a kelp forest in the "Aquarium" segment of his Carnival of the Animals. Do you think he succeeded? Could you make up a "kelp forest" dance to go with this music?

*Task for the day:* What items do you have around home that could clink together in the wind and make a peaceful noise to remind you of swaying ocean currents?

Here are some ideas:

* Empty tin cans (recycling bin)
* Seashells
* Driftwood
* Bottle tops
* Old, disused keys
* Sea glass
* Seed pods
* Old spoons, forks

How to make a wind chime:

* Collect your materials.
* Use a hammer and nail or drill to make a hole in each item. (Get adult help)
* Thread wool, string or fishing nylon through the hole in each item and tie a knot behind the hole to secure it.
* Tie the other end of the string to a stick. Add several items, close enough together to bump each other. Secure the stick to a tree branch.
* Think about the sound of different materials - how might the music from a wind chime made of shells sound different to the tins?



#15 Carnivorous Land Snails – Dead Heat

Giant carnivorous land snails don’t ask for much: moist leaf litter to burrow into, earthworms to suck up like spaghetti. But if the lower layer of the forest is nibbled away, if sunlight reaches the soil, & if 1 month of drought follows another, molluscs relying on damp homes struggle to survive. <https://www.nzgeo.com/stories/dead-heat/>

*Talking points:* Discuss the ideas presented in the story

* Is there anything about the snail's anatomy that surprises you? (see photo)
* The writer mentions pigs, possums, rats, weka and thrushes as animals that prey on our native snails. Can you think of any other animals that might give them a tough time - in our gardens or in the bush?
* Recently, a lack of rain seems to have been the greatest killer of native snails. Why is moisture so important for snails? Can you think of any solutions to this problem?
* We have almost 10 times as many species of snails here in New Zealand than they do in Britain. (We have about 1400, they have only 112.) Do you have any ideas about why they have so many less species of snail over there?
* What did you think of the snail in the photo slurping up the earthworm like we slurp up spaghetti? Did the "hard" golden eggs in the photo surprise you? Why or why not?
* In the article, Gary Barker says that people are not as motivated to look after endangered snails as they are to look after endangered birds. What do you think about that? Do you think our native snails should be equally well-known, or not?

# *Task for the day:* Finding the Fibonacci spiral in your garden: Did you notice the beautiful spiral shapes on the snail shells in the article? Looking at snail shells helped a mathematician called Leonardo Fibonacci to develop his theory about spirals. He noticed that you can draw a perfect spiral shape onto maths paper by following a pattern of numbers where the first two numbers added together make the next number in the sequence. The pattern starts with 1, 2, 3, 5, 8, 13, 21 and goes on indefinitely. Similarly, a spiral shape could spiral out forever. Go on a Fibonacci hunt - can you find any spirals? How about leaves, or flowers, that use any of these numbers?

#16 Humpback whale - Tracing song lines...Humpback whales make their own culture, which they record in songs, in the same way as Kiwi culture is recorded in our language and culture. After centuries of whaling that nearly silenced the song of humpbacks, the singing giants are making a steady recovery in most places. Yet the population of the South Pacific that was hardest hit by Soviet whaling in Antarctica remains endangered, numbering fewer than 4000 individuals. <https://www.nzgeo.com/stories/humpback/>

*Talking points:* Discuss the ideas presented in the story

* Humpback whales have exceptionally long pectoral fins. On their heads are bumps which are actually large hair follicles. Can you see either of these in the top photo? Are there any other features you find interesting?
* Are you surprised by how far humpbacks in the southern hemisphere travel every year? Do you think it makes sense to feed in Antarctica in the summer and calve in the tropics in the winter? Why do you think each location might be suited to the humpback's needs?
* A baby humpback drinks about 200 litres of milk a day. How many 2 litre milk cartons would that be? Do you think you could fit one day's milk supply in your fridge?
* Humpbacks communicate with pulses of sound that are louder than a jet engine and could rupture human eardrums; these pulses can travel thousands of kilometres through seawater. Why might that be useful to the humpback?
* Whale-watching is important to the Tongan economy. Would you like to go there to see humpbacks some day? Can you think of anything we can do as New Zealanders to help look after humpback whales?

*Task for the day* : An adult humpback weighs about 30 tonnes—that's six average-sized African elephants. How does such a heavy animal avoid sinking?

Explore the idea of buoyancy—how pockets of air (like those in a whale's lungs) make heavy things float—by making dancing "whales" with raisins.

* Get a large glass jar (a small jar may fizz over and spill)
* Fill to about 1/3 way up with water.
* Add 1/3 cup of white vinegar.
* Add 2 tsp of baking soda.
* Stir gently.
* Add 10-15 raisins and watch what happens!

The raisins will sink to the bottom but after a few moments, you'll hopefully notice them rising one by one. What makes them rise?

Can you see how each rising raisin is surrounded by air bubbles? Baking soda and vinegar react to produce bubbles of carbon dioxide. These bubbles are lighter than water so they cancel out the weight of the raisin, lifting it to the surface. Can you figure out why the raisins fall again after a while?

#17 Pet day

Every spring, rural traditions play out in miniature in the ring at the local pet day.

<https://www.nzgeo.com/stories/pet-day/>

*Talking points:* Discuss the ideas presented in the story

* If you were lucky enough to have a pet lamb, what would you call it? What about a calf?
* What might be some of the daily tasks involved in raising a pet lamb or calf? Do you think you'd be good at looking after a lamb or calf?
* "The key is to connect with your lamb," says contestant Ben Oakly. What do you know about some good ways to connect with an animal? How would having a good connection help you do well with the judging criteria?
* What do you think farming kids do on the morning of the pet day? Do you think parents help with the cleaning and grooming? What might the kids do to prepare the night before the show?
* Even if you didn't win a prize for your pet, do you think it would still be worth raising a pet and entering? Why or why not?

*Task for the day:* Create a lead for playing animal games at home. Use an old t-shirt or any kind of stretchy fabric for this project. Try to use something that was going to be thrown away so you save it from landfill! How to make an animal lead:

* Take an old t-shirt.
* Cut it into strips of about 2.5cm, from the bottom upwards. (Use fabric scissors if possible as cutting will be a lot easier.)
* This makes a lot of loops. Cut each loop on one side: now you have a lot of long strips.
* Tie three strips together in a knot at one end.
* Start plaiting.
* You may find it easier to tie the knotted end to a door handle or ask someone to hold it taut while you plait.
* When you run out of fabric, you can tie another strip on with a simple double knot, and keep plaiting.
* Keep plaiting and adding strips until you have used them all up or made your lead as long as you want to.
* Find someone to be a horse, calf, lamb or puppy and start playing! You can also use this plaited lead as a skipping rope or anything else you think of

#18 Te Araroa trail - Into the wild

After 3 weeks’ training and with limited outdoor experience, an Auckland teenager took the first step on a journey of more than 7000 kilometres. <https://www.nzgeo.com/stories/into-the-wild>

*Talking points:* Discuss the ideas presented in the story

* In the pictures, what looks challenging about Brando's journey?
* For the first four days, Brando walked south along Ninety Mile Beach. It rained. At night, he camped on the beach in the cold. He had cramps and mosquito bites. How do you think he might have been feeling at this point? Do you reckon you would have given up?
* The hardest part of Brando's journey was in some ways dealing with being alone so much. What would be weird about being on your own, without speaking to anyone for up to 11 days at a time? How do you think it would affect you?
* Brando used his crossbow to shoot wild goats, rabbits and possums, dived for paua and crayfish and ate all sorts of plants, roots, berries and even insects as part of his decision to "hunt and gather" rather than buy food from shops. Does that lifestyle sound appealing to you? Would you eat a possum or insects if you were hungry enough?
* Brando felt like going on a huge adventure was really helpful to him. Why do you think an outdoor adventure might make someone grow emotionally and mentally?

*Task for the day:* Go on a wild food hunt and see if you can find any of these common edible wild foods, all available in autumn:

* Grape leaves (make dolmades, or just eat the smaller leaves raw)
* Violet leaves (great in a smoothie)
* Nasturtium leaves and flowers
* Puha
* Dandelions—pick the younger leaves and eat raw, or boil them and add olive oil and lemon—this is a specialty of Greek grannies

A few foraging rules:

* Don't pick from a busy roadside where car fumes may have polluted your snack.
* Only take 1/3 of the plant—this leaves it plenty of energy to grow back for the next person who needs some nourishment.
* Avoid mushrooms unless you're with a mushroom expert—most New Zealand mushrooms are not edible.

## #19 Native Butterflies - Ghosts of Summer

# A butterfly landed on my foot today, casting sharp shadows across my toes. Its wings were the colour of the sea, and shimmered much the same. It was a little blue one of a couple of dozen native butterflies in New Zealand. Let's learn about them “Butterflies don’t want everything all neat and tidy. They prefer things unkempt,” says the unrepentant director of Alexandra’s Central Stories Museum. “We have to leave a few wild corners…marginal habitats, roadsides, fallow paddocks.” Learn about butterflies. <https://www.nzgeo.com/stories/ghosts-of-summer>

*Talking points:* Discuss the ideas presented in the story.

* What kind of butterflies have you seen before? How do you feel when you see a butterfly? What do you like or not like about them?
* Were you aware that New Zealand has about twenty species of butterfly? Why do you think a lot of people think we have only monarchs and cabbage white butterflies?
* What do you think a manicured lawn looks like? Why might a manicured lawn be the enemy of butterflies? In the butterfly "sanctuary" of Jacqui Knight's Russell home, the writer describes swan plants and stinging nettles, nectar-bearing flowers and shade houses. To what extent is it realistic for other people to create this sort of butterfly sanctuary?
* Do you think it's surprising that butterflies sometimes get blown all the way from one country to another? What would their journey be like? Can you think of any other ways a butterfly could accidentally "move countries?"
* Do you think we might be able to attract butterflies back to more parts of New Zealand one day? Why or why not?

*Get creative:* Explore symmetry with a butterfly print.

* From the centre fold, draw half a butterfly.
* Cut it out.
* Open the folded butterfly out flat.
* Paint one half of the butterfly. (Paint thickly so it doesn't dry too fast.)
* Carefully fold the paper over and press the halves together.
* Unfold to reveal a full, symmetrical butterfly.

#20 Archey’s Frog – A Leap in the Dark

Of all the world’s amphibians, the most evolutionarily unusual and critically endangered is the Archey’s frog. The smallest of New Zealand’s four native frogs, this ‘living fossil’ hasn’t changed much in 150 million years. It didn’t evolve ears or a voice, prefers the forest floor to water, and can’t leap without landing in a bellyflop. Why are Archey’s frogs so strange, and what makes them so important? <https://www.nzgeo.com/stories/a-leap-in-the-dark/>

Talking points: Discuss the ideas presented in the story with your family—at home or over video conferencing. Find ways to involve as many people as possible, especially those who you know are isolated by the lock-down.

* Are you surprised that Archey's frogs don't live in water, preferring the forest floor? How about the fact that they produce "froglets" rather than the usual tadpoles? Do you think Archey's frogs should be more well-known?
* Archey's frogs live for 30 or 40 years and they don't usually move beyond a square metre in that time. Why do you think they are so happy to stay in one place? What does this fact show us about their feeding methods?
* How will the work at Auckland Zoo help the Archey's frog populations in the wild? What is challenging about the done by the zoo and other kaitiaki?
* Do you like the idea of a nature area with frogs as the primary focus? Would you find it interesting to visit a place like this? Can you think of any forests or islands that could work for a translocation of Archey's frogs?

*Get creative* —"Frog Reveal" Picture: This technique is "Sgraffito" which comes from the Italian word for "to scratch." It is like a home-made version of the "scratchies" that are sold at $2 shops.

1. Heavily crayon patches of green and brown onto a small piece of paper, covering the entire thing so it looks a bit like army camouflage.
2. Then take a black crayon and colour heavily in black over the entire page
3. Get a kebab stick, toothpick or sharp stick.
4. Scratch the shape of a frog and any leaves you want to put in the background.
5. As you scratch, the green and brown will show through.

#21 Water - Liquidation

Water, our most precious natural asset, offers amenity, a habitat for aquatic species and a focus for recreation. But it also turns the turbines of industry and powers NZ’s agricultural economy. Economic development and environmental integrity are at odds in a struggle for control over this great resource. Are we mortgaging our future for a little more economic growth? https://www.nzgeo.com/stories/liquidation/

*Talking points:* Discuss the ideas presented in the story with your family—at home or over video conferencing. Find ways to involve as many people as possible, especially those who you know are isolated by the lock-down.

* In the top picture, does the water look like you expect water to look, or a bit different? What colours can you see?
* The Southern Alps interrupt rain clouds drifting eastward over the Tasman Sea, so Fiordland and the West Coast get lots of rain but Canterbury gets very little. Did you know that some parts of New Zealand get more rain than others? Do you have to be careful with water use where you live?
* A drop of water coming out of a Canterbury tap might have taken 100 years to get there—being squeezed through ancient rocks one drop at a time. Did you know that water comes from the ground? How else do you think we get drinking water in New Zealand?
* There are plans to make farms bigger and stock them with more animals, but this will use a lot more water. Some people think this will damage rivers. How might rivers change, if a lot more water were taken from them? Do you think it is important to leave nature alone or does it make sense to use it as a resource?
* Did you know that people used to be able to drink out of most New Zealand streams and rivers? What would it feel like to drink from a river? What are some things that make rivers clean for swimming and drinking?

*Task*—Make a rain gauge: Much of New Zealand was forecast to get some rain today, so have a go at learning to measure rain at your place—if you're lucky enough to get any!

1. Take a large plastic bottle. A bottle without a handle is easiest to use but just use whatever you have.
2. Take off the lid. Cut the top quarter or so off the bottle.
3. Insert the cut-off top into the bottle. This creates a funnel which will stop your collected rainwater from evaporating.
4. Hold a ruler against the bottle, with 0 at the base.
5. Get a permanent marker and mark on each cm up to 15 cm (higher if you like.)
6. Place your rain gauge outside in the open, away from trees and buildings.
7. Secure it in place by burying it slightly in the garden or in a pot.
8. Wait for the rain! Make sure you empty it out every day so you can measure from 0 each time you check.

#22 White Island - Life after Death

In 2019 Whakaari/White Island erupted killing 20 people and injuring two dozen others. Despite its reputation, the island remains a haven of life. The forces that built the island influence the seas around it. What can we learn from our most active volcano? https://www.nzgeo.com/video/white-island/

*Talking points*: Discuss the ideas presented in the story with your family—at home or over video conferencing. Find ways to involve as many people as possible, especially those who you know are isolated by the lock-down.

* Recently Whakaari/White Island erupted, killing some people and injuring others. In an environment that is so dangerous, did you expect to see so much life?
* Which of the White Island "locals" did you find particularly interesting or beautiful? How about the pelagic - ocean-going - species that were shown visiting White Island?
* What did you think of the way the gannets have learned to retrieve seaweed and use it to cool their chicks? Can you think of anything else you could do to help with this if you were a gannet?
* What did you notice about the gannet's body as you watched it diving into the water after prey? How about the way it used its body underwater?
* Have you heard of super-pods of dolphins before? The gannets benefited from the super-pod's feeding technique. Where else did you see one species benefit from another species' hunting method?

# *Task:* Make a volcano: Has it been a while since you made a volcano?

1. Take a bottle such as a milk bottle.
2. If you have some newspaper handy, you can build up the base of the volcano to give it a more conical shape. Tear the newspaper into little strips and dip them into a solution of glue and water (you can also make a paste from flour and water, or corn-starch and water.)
3. Layer them onto the milk carton.
4. Leave it to dry. (Using a hair-dryer speeds up the process.) Paint your volcano.
5. Use a funnel to put about 2 tablespoons of baking soda into the bottle.
6. Add food colouring in yellow, red or orange if you have any.
7. Add a teaspoon of dishwashing liquid for extra froth
8. (Take the bottle outside at this point just in case of mess.)
9. Now add 3 tablespoons of white vinegar to make it erupt.
10. You can add more vinegar to make it erupt again and again... eventually you may need to add more baking soda and food colouring too.

#23 Sailing

Most of the stellar yachting careers of NZ’s America’s Cup sailors began in humble 7-foot boats—a class now a century old—designed by a Public Works employee who couldn’t swim, and who was too hard up to build anything larger. What can we learn from the P class? https://www.nzgeo.com/stories/p-class/

*Talking points:* Discuss the ideas presented in the story with your family—at home or over video conferencing. Find ways to involve as many people as possible, especially those who you know are isolated by the lock-down.

* In the top photo, the adults and the young sailor look tense as they measure the sail to check it's the regulation size. Why is the size of the sail important for a race? Why do you think the boats have to be carefully weighed?
* How do you think it feels to be in a race like this, where you have to control your boat in among lots of others? Does it look like fun to be "stacked out" over the side of the boat? How do you think this works?
* Famous kiwi sailors such as Dean Barker and Peter Burling sailed P class yachts. What makes a small boat good for learning about big boats?
* Learning to sail might involve lots of frustration as you figure out how it all works. You'd get wet and cold at times. Setting up the gear and packing it away takes a while. What makes people keep on with a sport like sailing?
* At thirteen years old, the writer sailed a P class with his friend and camped at Rangitoto, the Noises, Rakino and Motutapu Islands. They were away from home for four nights. What do you think sounds exciting or surprising about this journey? What does it show you about how life has changed since 1950?
* Is sailing, or another water sport, part of your family's heritage? Is there anyone in your extended family who might have some stories about family members having adventures on the water? If not, there might be other stories about adventures that you could find out about.

# *Task:* Make a Home-made kite: It's blustery out there—harness the wind with a home-made kite. There are lots of ways to make a kite! Here's one.

1. Take two light sticks—one should be longer than the other.
2. Tie the sticks together in the middle so they form a cross, with the across-ways stick higher than halfway up the vertical stick.
3. Lay the sticks on some fabric—an old broken piece of tent could work well—or any light fabric. Cut a diamond shape around the sticks.
4. Hot-glue the fabric onto the sticks.
5. Add on a tail—it's important to get some weight in the tail to help the kite hang correctly, so tie a couple of fabric bows onto the tail.
6. Tie string or wool to each side of the centre point where the sticks meet. Bring these together and tie them in a knot.
7. To this knot, add on 6-10 metres of string or wool and wind it from the loose end around a small stick.
8. Find a windy spot and hold your kite up into the air. When the wind catches it, you can let go and let out some line.

#24 Moa footprints - Seven Steps

An Otago man out for a walk made a significant palaeontological discovery. What do you think he found?

<https://www.nzgeo.com/stories/seven-steps/>

*Talking points*: Discuss the ideas presented in the story with your family—at home or over video conferencing. Find ways to involve as many people as possible, especially those who you know are isolated by the lock-down.

* Have you ever seen a moa skeleton or a moa egg in a museum? How about a moa sculpture or reconstruction? What do you know about moa?
* Can you imagine how Michael Johnstone , the man who found the footsteps, must have felt when he noticed the giant prints in the river? What do you think you would do if you saw something like that?
* Were you surprised by the size of the footprints—30cm by 30cm? Do they look similar to any other kind of bird footprints that you've seen before?
* Did you know that some people take artefacts such as moa bones and footprints and sell them on TradeMe? Do you think this is fair? Why or why not?
* The footprints were buried under clay and soil, where they lay hidden for millions of years before being exposed by flooding. Is it possible that similar footprints could lie beneath the soil in lots of other places - even where you live?

*Task*: Make your own imprint fossils

Imprint fossils are made when matter is pressed into clay or silt. It could be a bird's foot making the imprint, or a leaf that is pressed into the ground. Long after the bird has walked on or the leaf has decomposed, the print remains in the clay.

You can have fun making your own imprint fossils by pressing materials into clay. For example, a leaf (push on it with the bumpier side down) or a shell. Are there any plastic animals you could try making footprints from?

1. Gather some clay. Use what suits you best—you may have your own clay, or you may have a garden with clay soil you can extract from. If you want to use kitchen resources, you could make a salt-dough using flour and salt, or a corn-starch dough using corn-starch and salt.
2. Gather materials to make imprints with: leaves, shells, lichen, twigs.
3. Gently press or roll out a disc of clay. If you'd like to hang it up later, make a small hole at one end. You can tie string through this hole when it has dried.
4. Press your item onto the clay disc. If you are using a leaf, put the bumpy side down. Peel it off and your fossil imprint is revealed

#25 Fiordland

In the cold, steep world of the fiords, tannins block out sunlight to the world below. The fiords are cold and inhospitable in winter, when they receive little light and freeze over at their extremes. In this unforgiving world there are no second chances. Visit the Shadowland.﻿

https://www.nzgeo.com/video/fiordland-2/

*Talking points* Discuss the ideas presented in the video with your family—at home or over video conferencing. Find ways to involve as many people as possible, especially those who you know are isolated by the lock-down.

* We saw deep valleys, waterfalls and tall mountains—do you like the scenery at Fiordland? Would you like to visit there? How about live there? Why?
* In Fiordland the water is sheltered from currents and tides, so incoming fresh water sits on top of salt water, instead of getting mixed up evenly. This makes the marine life here quite unique. Which creatures did you notice that you haven't seen before?
* The Fiordland crested penguin chooses to nest in the bush, often under rocks bushes or tree roots. They have a number of behaviours such as porpoising, so they can come up to breathe while maintaining a fast swimming speed. What did you think was appealing or interesting about this species?
* Why do you think the underwater areas where coral grows are known as Fiordland's "china shops"? How could humans hurt these china shops and how do you think they might be protected?
* Fiordland is also known as Ata Whenua, the Shadowlands. How did you see species working around the lack of sunlight in the wintertime? Could the cooler temperatures become attractive to other species in the future, as more northern seas warm, and what impact would that have on the Fiordland ecosystem?

# *Get Creative*: Can you draw a portrait of someone in your family? Send us in a photo of your portrait and we'll share them on our website.

#26 Spiders

Today we look at the creepy and crawly critters in our backyards and berms. Consider the spider...

<https://www.nzgeo.com/stories/eight-legs-two-fangs-and-an-attitude/>

*Talking points:* Discuss the ideas presented in the video with your family—at home or over video conferencing. Find ways to involve as many people as possible, especially those who you know are isolated by the lock-down.

* Did you know that New Zealand has around 2,000 different types of spiders? How many different spiders do you think you have seen around your place? Have you seen different types of webs? What do they look like?
* The fishing spiders in the photos are hairy beasts. Are you surprised by what these spiders look like? Do you think they're cute or horrible? Do they look like any kind of science fiction creature or remind you of anything else from movies, cartoons etc? If you gave them a cartoon voice and personality, what would it be?
* Most Dolomedes spiders don't spin webs, instead putting their feet on the water to detect the tremors caused by moving prey. Then they are able to run across the water to fetch the prey. What do you think of this hunting method? What could be a "down side" to hunting like this?
* The writer (who is a scientist) enjoyed feeding a female Dolomedes a moth and watching her eat it and clean herself. Would you find it interesting to hand-feed a spider and watch it eating for half an hour? Could you try this at home? What might you see if you did?
* What do you think of the set-up at the writer's flat, with 16 paddling pools full of fishing spiders for her research? Do you think this seems like an interesting and fun job? She was finding out whether crowded conditions affected the spider's rate of cannibalism—how might she have set up the different paddling pools to investigate this?

# *Task*: Spider web hunt: Go around your house and garden and find as many spider webs as you can. What kind of styles of webs do you find? People are usually aware of the orb spider's web, which radiates around a central point, but spiders are diverse and creative. You might even find one in some unexpected places, such as this one on the underside of a leaf.

#27 Lichens

Lichens—like us at the moment—are playing the long game. Let's learn some lessons from our most patient plants... <https://www.nzgeo.com/stories/the-microscopic-world-of-lichens/>

*Talking points*: Discuss the ideas presented in the video with your family—at home or over video conferencing. Find ways to involve as many people as possible, especially those who you know are isolated by the lock-down.

* Would you say you have paid a little, or a lot of attention to lichen before reading this article? What colour lichens do you think you have seen before? What shapes of lichen have you seen—flat, hairy or crust-like lichen? Any others? Have you seen it on wood? Rocks? Gravestones? Asphalt?
* What do you notice about the orange lichen, seen under the magnifying glass, in the second to top picture? Does the shape of the magnified lichen look a bit like a mushroom to you? Lichen is made by fungi and algae living together like flatmates—can you figure out where the fungi and algae might each be?
* For a tiny plant, lichen is powerful—it can dissolve rock. How could this make lichen a "helping" plant in terms of supporting other plants and animals?
* Lichens grow very slowly, so the largest lichens on Earth may be around 5,000 years old. They're probably the world's longest-living organisms. What does this fact make you think or feel about lichens? What might enable lichens to survive for such a long time compared to other living things?

# *Task:* Lichen Riddle: Write a riddle about lichen. Riddles are traditionally written in the first person, using the word "I" and describing the mystery item using clues. Here's a riddle about oranges:

I am as round as a ball  
Bite into my shield and you will wince  
But inside, a sweet surprise.  
What am I?

Test out your lichen haiku by sending it to someone to see if they can figure it out!

#28 Poor Knights Islands

New Zealand’s Poor Knights Islands is considered one of the world’s top dive sites and for good reason, with a rich collection of extraordinary characters and bizarre behaviours, including a unique congregation of stingrays and sex-changing Sandager's wrasse. Let's dive in... <https://www.nzgeo.com/video/poor-knights-islands/>

*Talking points*: Discuss the ideas presented in the video with your family—at home or over video conferencing. Find ways to involve as many people as possible, especially those who you know are isolated by the lock-down.

* The Poor Knights Islands are a marine reserve. What do you know about marine reserves? What might be some of the pros and cons of marine reserves?
* There are a lot of colourful animals in this episode. Which ones did you like? What did you notice about the ways many animals changed colour at night? Why might they do this?
* Did you feel surprised to see the blenny being visited by the much-larger demoiselle, asking for some help to remove parasites? How do you think fish communicate with each other? What did you think of the blenny's hiding place?
* Did you learn anything new about tuatara or giant weta from what you saw in this episode?
* Do you have any ideas about how the Sandager's wrasse might breathe while it is buried in the sand at night? The Sandager's wrasse organises its society in quite a different way, with one male and lots of females, all of whom can potentially "take over" as the male. What do you think might be an advantage of this system?

# *Task:* Paper Bead Bracelet: Lots of the creatures at the Poor Knights are colourful and beautifully decorated. Make yourself an eco-friendly decoration by following these instructions for a paper-bead bracelet. Each bead in this bracelet will be unique!

1. Tear a page out of an old magazine Try to choose one with mainly pictures on it rather than words as it will look more colourful. (You could use an old piece of your own artwork if you prefer.)
2. Turn the page portrait-wise and fold the bottom up by about 1cm.
3. Cut about 10cm along the fold and then cut diagonally in from the bottom edge, so that you end up with a long skinny sail shape.
4. Open this out. Place a toothpick at the bottom of the triangle and start folding the paper around the toothpick.
5. Secure the bead with a bit of tape and remove the toothpick.
6. Thread the beads onto cotton and tie the ends together.

#29 Trout – signs of liife

Like a planet in space, a rainbow trout egg sparks and crackles as biological processes begin a miraculous transformation, the same that progresses silently in the inscrutable waters of New Zealand’s wild rivers every day. But even in clean rivers, the odds are stacked against this small vessel of life—only one in a thousand eggs will hatch and survive until adulthood. <https://www.nzgeo.com/stories/signs-of-life/>

*Talking points*: Discuss the ideas presented in the video with your family—at home or over video conferencing. Find ways to involve as many people as possible, especially those who you know are isolated by the lock-down.

* What does the top picture of the egg remind you of? What do you find interesting or amazing in these photos?
* In the second photo, a fungus has infected the egg. What could this teach us about the abilities and habits of fungi? What other dangers might face the eggs that have been laid on the river bed?
* Can you see the egg sac in the middle of the newly hatched fish's abdomen? Do you like the phrase "buttoning up," which is used to describe the fish's sides fusing together once the egg sac is no longer necessary?
* What can you see developing and changing in the chart showing the trout's development?
* Nitrogen in rivers causes mats of algae and fungi to grow, smothering aquatic life such as baby trout. Do you know much about how nitrogen ends up in rivers, or how rivers can be protected from it? Have you ever seen rocks covered in a mat of algae or fungi in a river?

*Task:* Make a magnetic fishing game

1. Make about six fish. Use any thicker paper or cardboard for this—an old piece of your own art works well. Draw a basic fish shape and cut it out.
2. Attach a paper clip to each fish's mouth.
3. Make a fishing rod with a stick (or knitting needle, pencil, dowel etc) and a length of string tied to one end. Secure where you have tied the string on by adding a dab of blu-tack.
4. Make a large fish-hook to attach to the other end of your fishing line. Draw the fish hook on paper or cardboard and cut it out. Find a small piece of magnet around your house (there may be magnets on your fridge you can use) and glue, or blu-tack it onto the hook. (If you can't find any magnets or magnetic strip, you could bend a paper clip open and glue that onto the hook - it can hook through the paperclip on each fish.)
5. Dangle the hook over your fish to see how many you can catch.
6. Learning one of your times tables? Make 12 fish and write a times table on each one (such as 5x4). Each time you pick up a fish, you get to keep it if you can give the right answer. See if you can get better at it, until you get 12 out of 12!

#30 Clouds

They are the supertankers of the sky, ferrying billions of tonnes of water vapour around the atmosphere and making possible life on land. <https://www.nzgeo.com/stories/the-glory-of-clouds/>

*Talking points*: Discuss the ideas presented in the video with your family—at home or over video conferencing. Find ways to involve as many people as possible, especially those who you know are isolated by the lock-down.

* Do you have a favourite out of the photos of clouds in the article? Have you seen clouds similar to any of these? Do any of these clouds look like they have raindrops in them to you?
* Do you enjoy watching clouds? How do you feel when you lie on your back and watch the clouds race by, or change slowly? When do you feel like you mostly notice clouds—when you look out of the window? When you bounce on the trampoline?
* Can you imagine living in a world with skies that were one colour all of the time? Would you miss clouds if they weren't there?
* Do you feel surprised to read that a cumulonimbus cloud can be 10,000 metres tall? How about the fact that the average raindrop is only one hundredth of a millimetre in diameter?
* The article describes clouds as a sort of blanket over the earth. Have you noticed that clear, starry nights are colder than cloudy nights?

*Task*: Make a Melted Crayon Cloud: Use up any small, broken pieces of crayon by making a melted cloud out of them.

* 1. Using scissors, scrape shavings from pieces of broken crayon. Work over a piece of paper.
  2. Use a stick or a clean finger to make the shavings into a cumulus cloud shape.
  3. Place wax/baking paper over the cloud and press a warm iron directly onto it. Don't move the iron, keep it in one place to prevent smudging. A few seconds should be enough. (Newspaper or kitchen towels beneath your artwork will keep the ironing board clean while you do this.)
  4. Remove the wax/baking paper and voila—a melted crayon cloud.

#31 Open Bay Islands

On New Zealand’s remote Open Bay Islands, New Zealand fur seals protect their newborns from surging seas, starvation, and predation by great white sharks. <https://www.nzgeo.com/video/open-bay-islands/>

*Talking points*: Discuss the ideas presented in the video with your family—at home or over video conferencing. Find ways to involve as many people as possible, especially those who you know are isolated by the lock-down.

* What was your reaction to the mother seals—one gives birth at the beginning and another has a long labour. What did you notice about these births? Were there any similarities or differences to human births?
* A weka and gull fight over the baby seal's afterbirth. What did you think of this when you watched it? What are the benefits of having these kinds of opportunistic feeders around? What could be a downside?
* Did the footage of the starfish surprise you? Did you know about all the tubular feet that allow a starfish to move, or the way they actively catch prey? What creatures do you guess might prey on starfish?
* The octopus has a good long-term memory as well as a good short-term memory. How might this help when attempting to break into the craypot to eat a crayfish? What is your favourite creature—the crayfish or the octopus?
* What are some of the things you admire about fur seals after watching this? Why do you think the Open Bay Islands make such a great home for seals?

*Task:* Make a bubble machine: The seals create some amazing bubble-trails underwater while they frolic and swim a top speed. Create your own bubble machine out of a bottle and a sock!

1. Take a smallish bottle such as a shampoo bottle. Cut off a couple of centimetres or so from the bottom of the bottle. Take the lid off the bottle and give it a wash—you will be blowing into it.
2. Find an old sock. Fit the open end of the sock around the bottom of the bottle so that the toe of the sock dangles down.
3. Secure the sock in place with a rubber band.
4. Mix up some dishwashing liquid and water in a bowl.
5. Dip the sock into this bowl of soapy water and make sure it is thoroughly wet.
6. Blow gently into the top of the bottle. Bubbles should froth out of the sock.

# 32 Takahē - Road to Recovery

Once thought extinct, takahē have endured a lockdown to protect the species—just like us! Their numbers are now rising by 10 per cent a year which makes a new problem: Where do we put them? <https://www.nzgeo.com/stories/road-to-recovery/>

*Talking points:* Discuss the ideas presented in the story with your family—at home or over video conferencing. Find ways to involve as many people as possible, especially those who you know are isolated by the lock-down.

* Did you know that takahē were thought to be extinct, until they were discovered in the Murchison mountains in 1948? How do you think people reacted when takahē were discovered? Do you think they were surprised by the takahē in any way when they saw it for the first time?
* What kind of qualities and skills would a takahē ranger need to have? Does it sound like a job you would find interesting or enjoyable?
* When the female takahē Pipper dies, the rangers find her "teenage" chick incubating the eggs in their mother's absence. What do you think of this arrangement of having older chicks helping with the eggs and new-borns? Is it a common arrangement in the animal world?
* Takahē produce grassy poos—nine metres of them every day. They make all that poo by nibbling through the stalks of tussock, only eating the sweet base of the stalks and leaving the rest "felled" on the ground. What might rangers look for to figure out where the birds are hiding?
* There are 375 takahē left: conservationists hope that number will increase. Do you think it is a good idea to try to ensure takahē are found all over the South Island once more? Do you think it is a realistic goal or not? What would need to happen to make this dream a reality?

# *Task*: Make a pompom takahē chick: Takahē chicks are actually black, but use any coloured wool or string that you have at home to make this cute baby takahē.

1. Take a fork from the cutlery drawer. Drape a piece of wool (around 15cm long) between the two middle prongs, so that half dangles down the front of the fork and half dangles down the back.
2. Hold this wool in place with your non-dominant hand while you wind a new length of wool about 35 times around the fork-head.
3. Bring the ends of the dangling 15cm piece of wool together and tie a knot as tightly as you can in the middle of the fork-head, making a sort of bow-tie shape out of the wool you have wound.
4. Slip it all off the fork. Now carefully cut the wool on either side of the "bow tie." Fluff up your pompom and trim any straggly bits. This is the body of your chick.
5. Make another one (make it smaller than the first one if you can by using a children's fork, as this pompom will be the head.) Glue this smaller pompom onto the larger pompom.
6. Cut two lengths of pipe-cleaner or another wire to about 4cm. Weave these through the binding loop of the big pompom and shape them into feet. You could also make paper or cardboard feet.
7. Add some facial features. Use felts or permanent markers to make a face and beak, or glue on beads or googly eyes if you have them.

#34 The Kermadecs

Alone in the Pacific, halfway to Tonga, sit the Kermadec Islands. This remote archipelago is NZ’s northernmost frontier and our toehold on the tropics. Everything that lives on and around these young islands has travelled far to be here and a unique mix of creatures thrive in its warm waters. As a marine community the Kermadec is unrivalled in NZ waters. <https://www.nzgeo.com/video/the-kermadecs/>

*Talking points:* Discuss the ideas presented in the video

* The booby is a large oceangoing bird. It looks a bit like a gannet or an albatross. What similarities and differences did you notice between these three birds?
* There were some unusual creatures shown in this episode—such as the sea hare which is like a slug with undulating "wings", the lionfish with its impressive "mane" of fins and the coral-munching starfish. What did you think about these creatures? Were there any others you liked or found creepy or interesting?
* The spotted black groper can grow as big as a person. Did you like the groper? How would you feel about seeing a groper if you were snorkelling or diving? Do you have any ideas about why this species has adapted to change colour when interested in mating?
* The booby's courtship rituals include pointing their beaks to the sky, beak clapping and synchronised preening. Why might the birds practice these behaviours? Did you think the boobies did a good job of sharing parenting duties?
* The mother humpback whale and her calf were midway through a journey from Tonga to Antarctica. What were your favourite things about the footage of the whales? You might have noticed the songs, the close up of the mother's eye, the baby frolicking, the mother giving the baby milk or the male coming to escort them on their journey, among other things.

# *Task:* Make an underwater diorama - This project is a diorama with a twist. Blue paper or cellophane in the lid gives the scene a mysterious glow.

* 1. Take a shoebox or similar sized box. Cut a rectangular hole in the lid. (Get help with this—a Stanley knife will cut the hole easily but it's a good job for an adult to do.) This hole lets the light into the box for viewing.
  2. Cut a peephole in one end of the shoebox. Make this hole circular; ideally it will be a bit bigger than a $2 coin. This hole is what you put your eye to view the scene when it is finished. (Get an adult to cut this.)
  3. Tape some blue or green cellophane over the rectangular hole in the lid. No cellophane? Try lightweight blue paper, paint some clingfilm blue, use tissue paper, use a blue or green plastic bag, or just leave the hole open.
  4. Decorate the interior of the box to create an underwater scene.
  5. Here are some things you can do: Make rocks out of scrunched up paper; stick these in place and paint them.
  6. Make seaweed by drawing it, cutting around it and sticking it in place (make it stand up straight with an ice-block stick behind it.)
  7. Cover the base with glue and sprinkle sand onto it.
  8. Use old artwork to cover the interior sides of the box, or paint the inside.
  9. Place some fish in the scene. You can draw these and cut them out, or you may have some pictures of fish in magazines that you can cut out. Use a needle and thread to "hang" your fish from the inside of the lid.
  10. Make some clay creatures such as starfish for the seabed.
  11. Carefully place the lid on the scene. Point the box towards the light and look through the eye-hole. You should see a mysterious ocean scene!

#35 Rongoā – Fields of plenty

Look closer. The straggling plants on the riverbank, the so-called weeds in the garden, the insect-eaten leaves on the forest’s edge—often ploughed, sprayed or simply ignored—are finding their way back into the medicine chest. And Maori herbal remedies, once derided and outlawed by an act of Parliament, are revealing their curative power.[https://www.nzgeo.com/stories/fields-of-plenty/]( https://www.nzgeo.com/stories/fields-of-plenty/%20%20)

# *Talking points*: Discuss the ideas presented in the video

* Did you know that plants could be used as medicine? Do you think there could be plant extracts in the medicine you get from the pharmacy?
* How do you think Māori and other indigenous people developed such a good knowledge of the different ways plants could help people? How do you feel when you read that Māori herbal remedies were outlawed in the past? Why might this have happened?
* In the top photos a woman is picking St John's Wort. She says it is a "great friend" of hers. What do you think she means by this? What could she mean when she says it is "liquid sunshine?"
* Goldminers planted trees and bushes when they came to Central Otago as a "living first aid kit.' What do you think this means? Do you know how to use any of the plants around you to help you when you get hurt? Do you think it would be fun to find out about this? Why might it be important to check with an adult before you chew or swallow a plant?
* Human activity such as building houses takes away the land that medicinal plants grow on. However, houses are needed. Can you think of any ways to provide room for medicinal plants as well as people?

*Task:* Make Medicinal Tea: Can you find a kawakawa plant or some rose bushes near your house? Both of these plants will make a wonderful healthy cup of tea. Other leaves you can pick to make tea include fig, lemon balm, dandelion and mint.  
*Rosehip tea*: On a rose bush, look for the red "fruit" on the bush. Pick a handful and put them in a tea pot with boiling water and a teaspoonful of honey. Steep for 10 minutes. Rosehips are high in vitamin C so this provides support to your immune system.  
*Kawakawa tea*: On a kawakawa plant, look for leaves with holes in them—these have the highest medicinal qualities. Pick 2-3 leaves and put them in a teapot with boiling water and a teaspoonful of honey. Some people also add some fresh ginger or a splash of lemon juice. Steep for 5 minutes. Kawakawa leaves support your digestive system.

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#36 Jellyfish

Drifting at any depth in all the world’s oceans, these creatures range from an Arctic species with a bell the size of a car, to a venomous microscopic Australian. Carnivorous predators, jellyfish swarm around our coasts and litter our beaches, yet we know surprisingly little about them. Some of the most recognisable species don’t even qualify as true jellyfish. One such, a Portuguese Man of War (Physalia physalis), its inflated bladder keeping it poised at the surface, is not even a single animal, but a sizeable colony containing four types of minute, highly modified polyps.[https://www.nzgeo.com/stories/jellyfish/]( https://www.nzgeo.com/stories/jellyfish/%20%20)

# *Talking points*: Discuss the ideas presented in the video

* Look slowly through the photos and try to pick a couple that you find the most interesting. What do you think is particularly fascinating about the jellyfish you chose? Do you wonder "what is..." "what does..." or "why" when you look at them?
* Why do you think some jellyfish have tiny fish hanging out beside them/inside them? Do you think there is any danger to the fish? Do you think it benefits the jellyfish in any way?
* What do you think of the jellyfish's anatomy, described at the very start of the article—including a mouth that doubles as an anus? What does it have, and what can you figure out about its lifestyle from its body features?
* Jellyfish look likely to become far more numerous as fish stocks get lower and the sea warms. How do you feel about eating jellyfish? What might the texture be like? How about the taste? What are some ways you could try preparing jellyfish to make it more appealing to eat?
* Many jellyfish can move intentionally by jet propulsion—taking in water through the bell and squirting it out the back. Remember what happens when you blow up a balloon, then let it go? Can you think of any other sea creatures that might use jet propulsion? How about types of transport or technology?

# *Task*: Make a String Jellyfish Painting: In this painting, you will create a jellyfish. You will work upside down on the paper, creating the head at the bottom of the page.

1. Near the bottom of your paper, place a thick blob of paint in any two colours of your choice.
2. Take a drinking straw or a piece of tubing and blow through it onto the paint. Blow the paint down the page. Keep doing this until the paint has spread out into a shape like the head of a jellyfish.
3. Take a length of string and dip it into paint on a palette or dish. Use a paintbrush to work the string into the paint and make sure it is well covered.
4. Pick the string up and lay it carefully onto the paper to make a print that looks like a jellyfish tentacle. You will need to cover it in paint again several times. finish when you think your jellyfish has enough tentacles.

#37 Banks Peninsula – Mountains meet the Sea

A drowned volcano, jutting out into the ocean, shelters one of the world’s tiniest marine dolphins. Fresh meltwater from Southern Alps rushes down braided rivers, washes food into the sea and percolates into wetlands that provide a home for the long lived and mysterious eels.

<https://www.nzgeo.com/stories/banks-peninsula/>

# *Talking points*: Discuss the ideas presented in the video

* The basking shark can grow up to 10 metres long. This is about as long as a bus! How is this shark similar to other sharks? How is it different? The basking shark is not well-known and scientists don't know much about it. Why do you think that might be? Did you like it? Why or why not?
* The scallop manages to escape from the eleven-armed starfish twice. How does the scallop move? What noise did it make? The starfish and the scallop seem to have quite a lot of personality. If you were making a cartoon about the sea floor, what kind of voice would you give each of them and what would you get them to say?
* The male pukeko organise their nest communally—the males take turns 'sitting' so they can also forage. Have you ever heard of a bird doing this? What could be the advantages or disadvantages of this system? This episode shows lots of socially-oriented animals. The penguins prefer to come ashore in groups. When one is injured, others stay around on the rocks with it. Basking sharks travel in groups. The spotted shag chicks hug each other so no one falls out of the nest. Did you have a favourite out of any of these animals? Why do you think animals help each other like this? Does it teach us anything about animals or change your ideas about animals in any way?
* The paradise shelduck nests high in a tree and her ducklings jump down to the ground soon after hatching. Did this feel worrying when you watched it? Why do you think the shelduck chooses such a high nest? Do you think ducklings sometimes die from the fall?
* Did you know that eels can be as old as 60 when they are finally ready to have babies? Did you know that eels are international travellers—coming from near Tonga when they are larvae, and going back to trenches near Tonga to mate and lay eggs at the end of their lives? If you have seen an eel in a creek, how old do you think it might have been? Why might it be important not to catch all the eels in our creeks, rivers and lakes?

# *Task*: Make a "Repousse" badge: Repousse is the French art of metal-embossing.

1. Draw a Hector's dolphin (or any creature you like) onto a tinfoil plate or dish. Ordinary tinfoil is too thin for this so you need something thicker.
2. Using a blunt pencil, trace heavily over your drawing. You can add some details around the main image if you want to, such as wave shapes or seaweed.
3. Flip the plate over and you will see the raised outline of the dolphin where you traced around it.
4. Cut around the image to make a badge shape. You can glue a safety pin onto it if you want to wear it. Take care with cutting this material as it can be sharp when cut.

#38 Artificial limbs - The leg shop

What happens when you lose a limb? You go to the leg shop. https://www.nzgeo.com/stories/the-leg-shop/

# *Talking points*: Discuss the ideas presented in the story

* If you had to make do without an arm or a leg, which do you think you would miss more, and why? What would you most miss doing ?How do you think you would adapt to keep doing your favourite activities? What might be your biggest challenge—physical, mental or emotional?
* Jennifer Wright, who makes prosthetic limbs, describes how she always knew she wanted to work with her hands. How did her childhood help her get ready for the job she does now? What were some key turning points and opportunities that led her to be ready for her job making prosthetics?
* It's important that the people who work at the artificial limb centres have good people skills. How do you think their customers are feeling as they arrive at the limb centre? How could they be helped to feel better about the situation they are facing? What might make them feel worse? Why is feeling good about the situation important for recovery from a physical trauma?
* Two year old Lydia, who is pictured, needs to get her prosthetic leg adjusted every month and a new one built every nine months. In addition to growing quickly, why else might a child need a constantly evolving, upgraded leg?
* What kind of innovations do you think the future of prosthetics? What would you design if you had the technology?

# *Task:* Make a Marionette Puppet: This simple marionette or string-controlled puppet allows you to control your puppet from above, making it great for puppet shows.

1. Cut a paper-towel cylinder down to about 10cm long. Make some slits around the top and bottom to allow your puppet person to have a head and to stand.
2. Poke holes into the sides. Slide a pipe cleaner or another kind of wire through the holes and twist them into arms with a loop for hands at each end.
3. Make a head for your puppet—a ping pong ball is an easy solution. You could also crumple paper into a ball and over this with a sheet of smooth paper or some fabric.
4. Dress your puppet in scraps of fabric. Wool makes good hair.
5. Attach long lengths of string to the hands.
6. At the other end of the string, tie on two ice-block sticks stuck together in a cross shape; this is your hand-hold.
7. Give your puppet a name and a character and tell a story with him or her.

#39 Kelly Tarlton

Although he is best remembered for the Underwater World on Auckland's waterfront which still carries his name 22 years after his death, that project was just the last in a life brimming with adventure, discovery, originality and zest. https://www.nzgeo.com/stories/kelly-tarlton/

# *Talking points*: Discuss the ideas presented in the story

* Kelly Tarlton is introduced as a treasure hunter—searching the sands for gold bars that were lost in a shipwreck. In one of the top photos we see him with a pile of coins. What kind of personality do you think Kelly Tarlton might have had? What makes you think this? Do you like the sound of treasure hunting?
* Kelly Tarlton discovered the underwater world when he went to see The Silent World, a film by Jacques Cousteau. Straight away he wanted to get underwater himself. Have you ever been snorkelling or diving? Have you checked out any of the virtual reality videos on the NZ Geo site? Why do you think people love exploring the underwater world so much?
* Kelly and his friend Wade Doak had to invent a lot of their diving gear in the early days, using things like bike pumps and garden hoses. What does this reveal about life in NZ at that time? What does it reveal about the personalities of Kelly Tarlton and Wade Doak? How might being inventive have been useful when it came to making Kelly Tarlton's Underwater World?
* Kelly Tarlton's drawing of an underwater world gives us a glimpse into how his amazing idea started. If you had millions of dollars and could build anything you liked, what would your dream underwater world look like? What species would you want to have there? How could you improve on what Kelly Tarlton created? Draw your own picture or just have fun thinking about it.

# *Task:* Make a Seashell Creature!: If you have shells lying around at home you can make this straight away—otherwise you'll need to visit a beach to collect a small number of shells for this project. Alternatively, use anything you have lying around—bottle caps, leaves, jar lids!

1. Look through your shells and see if you can arrange them to make a fantasy sea creature.
2. Hot glue the shells in place.
3. Use googly eyes, a coloured pencil or felt tip if you want to add any extra details to your creature.
4. Put it in the garden for an ornament or on a shelf somewhere.

# 40 Chatham Islands

Perched way out in the Pacific, Rangatira Island is pockmarked with thousands, maybe millions, of seabird burrows. Its forest remnants and rocky platforms also shelter some unique and critically endangered birds. But even endangered birds can make a tasty snack and, on a crowded island, there might not be enough room for everyone to rear their chicks.

<https://www.nzgeo.com/video/chatham-islands/>

*Talking points*: Discuss the ideas presented in the video

* The Chatham Islands are the final landmass in the South Pacific Ocean before Chile. What did you notice about the landscape shown on these islands? What kind of lifestyle do you think people have there? What might be an advantage and a disadvantage of living so far from mainland New Zealand?
* The skua are described as "tyrants" in this episode. What do you think is meant by this? Do you agree that skua are tyrants? Did you like the skua as you watched this episode, or not? Are there any other birds you can think of that are opportunistic feeders/scavengers?
* The pilot whales are actually a type of dolphin. Whales and dolphins are both cetaceans. How many other cetaceans can you think of? How did you see the whales help each other—particularly the matriarch, or lead female pilot whale?
* The baby hapuku are shown 40 days after we first saw them sheltering in their kelp raft, which is cast adrift from Banks Peninsula to head for the Chathams. What differences could you see in their anatomy after this time? What do you think they feed on while sheltering in the kelp raft?
* Did you realise that paua are so plain looking on the outer shell? What did you notice about the way the paua can move itself around? Do you think of paua as intelligent after watching this? Why or why not?

# *Task*: Make a cardboard relief painting of a black robin: A shallow cardboard lid such as a shoebox lid is ideal for this project.

1. Paint the inside of the lid with colours that make you think of the bush. Don't make it too dark as you want the black robin to stand out when you add it in later. Let this dry.
2. Gather a small amount of some native foliage such as ferns and kawakawa. Paint the top side of them with green paint and press carefully onto your lid to make print impressions.
3. Draw a black robin on thick cardboard. Cut it out and paint it black.
4. Stick the robin onto the scene.

#41 Citizen Science

You don’t need a PhD to find a new species, unearth a rare fungus or name an asteroid. New Zealanders with no specialist training are contributing to scientific research by monitoring streams, spotting rare plants, counting the birds visiting their back gardens, and putting GPS trackers on their cats. <https://www.nzgeo.com/stories/citizen-science/>

# *Talking points*: Discuss the ideas presented in the story

* What do you notice about the people in the top photo? Do they look interested in what they are doing? What do you think they are looking at/for? Do you think they're having fun? Would you like to join them if you could? Why or why not?
* Do you have any ideas about why entomologists only go out to collect insects after about 10am, when the dew is off the grass? Yellow plastic plates are laid in the bush to attract insects—why do you think yellow is so attractive to insects?
* In citizen science, people are invited to count "wading birds, moreporks, cockles, bats, kererū, Hector’s dolphins, monarch butterflies and freshwater mussels." Why don't scientists just do their own counting? Why might they welcome help from ordinary people from around the country?
* Kamera Raharaha got into citizen science when a friend showed her a native orchid near her house. She quickly became a regular observer of nature and now she can tell different insects by the colour of their eyes in the dark, or lead scientists to wheke (octopus) in rock pools. How do you feel when you learn about someone like this who has become so respected in the scientific community?
* Do you feel inspired to do some citizen science yourself? How could you find out more about citizen science in your area?

# *Task*: Be a butterfly scientist: Have you seen any monarch butterflies in your garden or at your school? It may be that these monarchs have been parasitised resulting in crumpled wings which do not work (like the picture below). A Wellington scientist is finding out more about parasitism in our monarch butterflies—and you can help!

Professor Phil Lester from Victoria University of Wellington is asking citizen scientists from around New Zealand to take a sample from the abdomen of butterflies.

“We know that the parasite is present in New Zealand, though we have no idea how prevalent it is,” Phil says. “Butterflies that carry a light infection of the disease may not display any symptoms. They might fly and behave just like an uninfected butterfly."

The more samples Phil can collect, the better information New Zealand will have about how this parasite affects monarch butterflies

### **Here's how you can help.:** Anyone primary school age or older throughout New Zealand can help Phil investigate how many butterflies in New Zealand have this parasite.

You can sample Ophryocystis elektroscirrha (or OE) parasites by pressing clear Sellotape or Scotch tape on a butterfly's abdomen. The tape will pick up the OE spores and a few scales of the butterfly.

1. First, catch a monarch butterfly—this video shows how to safely catch monarch butterflies without a net. https://www.youtube.com/watch?v=Mw6MtFzLXyA
2. Press a piece of ultra-clear tape against the butterfly's abdomen
3. Place the tape on a white piece of paper. Record the date, and the location of your sample
4. Include an address (preferably e-mail) so Phil can contact you
5. Place the sample in an envelope addressed to: Phil Lester, Monarch Disease Survey, School of Biological Sciences, Victoria University of Wellington, PO Box 600, Wellington 6140

Phil will count the spores in the laboratory and [his website](https://www.nzgeo.com/mailster/380540/e5bb74f451058bce1b8c4a3011207bc5/aHR0cHM6Ly93d3cud2d0bi5hYy5uei9zY2llbmNlL291dHJlYWNoL2NpdGl6ZW4tc2NpZW5jZS1vcHBvcnR1bml0aWVzL3RyYWNraW5nLWRpc2Vhc2UtaW4tbmV3LXplYWxhbmRzLW1vbmFyY2gtYnV0dGVyZmxpZXM) with the results.

#42 Deep Sea - Deep Space

By night, a menagerie of species rises to the surface of the ocean—rarely glimpsed, and in some cases never photographed. <https://www.nzgeo.com/stories/deep-space/>

# *Talking points*: Discuss the ideas presented in the story

* Which one of these photos do you like best? What do you find surprising or interesting about these creatures? Is there anything you'd like to find out more about from looking at these creatures?
* In the picture of Darryl Torckler's boat, we see some amazing star patterns above, and the glow of the lights below. We learn that in blackwater photography, you sometimes wait for hours until fish are attracted to your lights. Would you try this as a hobby? What would think you might do while you were waiting for fish? How would you feel when the fish appeared and it was time to get into the water and start capturing photos?
* Creatures from the deep travel up to a kilometre to get to the rich food created by plankton converting sunlight during the day. Did you know there was a kind of "night shift" of creatures feeding while others rest at night time? How do these creatures seem to be similar and different to the "day shift" creatures, judging by the photos?
* Young female blanket octopus sometimes rip the tentacles off man-of-war jellyfish and use them as stinging whips to defend themselves. How do you think octopus developed this defence strategy? Who might they use it against? What else do you know about the intelligence of the octopus?

# *Task*: Make a Benthic "Bottlefish": Grab a milk bottle and some tinfoil and make a benthic creature that is limited to your imagination.

1. Start cutting near the base of the bottle, then cut around the bottle in a continuous strip until you get near top of the bottle. You should end up with a top and bottom of the bottle, connected to each other with a curly spiral.
2. Wrap your bottlefish in tinfoil, using the neck of the bottle as an open mouth. Fan some tinfoil out at the back for a tail.
3. Leave the spiral as fins or tentacles to dangle from the bottom of the fish.
4. Add coloured spots onto your fish with crayon shavings melted under the hairdryer, if you want to
5. Give your fish some eyes. Poke a pencil through the middle of the top of the fish and poke some string through to make a hanger so you can display your benthic creation.

#43 Waste not Want not

In our rush through modern life, we leave behind a mountain of rubbish that gets a little higher every year. The problem starts in our homes—so does the solution.

<https://www.nzgeo.com/stories/waste-not-want-not/>

# Talking points: Discuss the ideas presented in the story.

* The grandmother mentioned in the article had only about 12 items on her monthly shopping list—including flour, sugar and floor polish. She made everything else - even toothpaste, shampoo and soap. Did you know it was possible to get by with buying so few items? What skills must the grandmother have had that most people don't have today? Why don't more people make things like shampoo?
* In 25 years, the amount of rubbish created by the average New Zealander has skyrocketed—by 73%. Why might we create so much more rubbish than we did 25 or 30 years ago?
* Every month, New Zealand's rubbish fills up a rugby field that is 30 stories high. Can you imagine a rubbish pile this big? What about a pile of rubbish that was the size of 30 rugby fields?
* Three quarters of the rubbish that New Zealanders send to the tip could have been re-used, recycled or recovered. Why do you think people throw things away rather than doing this? Can you think of any ways we could get our society to throw away less things?
* Has your family made any efforts to cut down the amount of rubbish you send to landfill? Think about what you regularly buy—are there any items on that list that are not recyclable? Could you find another way to make or source this food? What changes would you need to make in your family to try to make less rubbish?

# Task—Leaf Skeleton Hunt: Human-made rubbish lasts hundreds of years. By comparison, it is great to look closely nature's amazing ability to biodegrade and recycle nutrients. Go on a leaf-skeleton hunt and collect a range of leaves—from freshly fallen, to partly decomposed, to skeletons if you can find any.

Arrange them on paper—glue them on if you want to or just look at the amazing process the leaves undergo as they lie on the ground.

If you find any pretty coloured leaves you can hang them on a window to catch the light.

1. Collect some pretty leaves and make a small hole at the top of each leaf (a needle makes a suitable hole.)
2. Take a length of elastic and knot one end.
3. Poke the elastic through the hole of each leaf, leaving a gap between each.
4. Knot the other end of the elastic.
5. Stick the two ends of the garland onto the window with tape or blu-tack.

#44 Fussy Eaters

In the world of extreme animals, meet the babies! From the cute and the seemingly helpless, to the weird and sometimes creepy, get ready for a top ten countdown of the world’s most extreme animal infants. Starting with what, and how, they eat. <https://www.nzgeo.com/video/fussy-eaters/>

# *Talking points*: Discuss the ideas presented in the story

* The humpback whale's milk is 10 times fattier than cow's milk. Why might a whale need protein with a higher fat content than a cow? What do you think of the humpback whale's bait-ball hunting technique? Do you think most people would be surprised to learn that whales can make a 'net' out of bubbles?
* Sea otters have the densest fur coat in the animal kingdom—about 140,000 hairs per square centimetre. This is over 10 times as dense as the hair on the human head. Did you notice any ways the otters benefit from their warm coats? What else impressed you about the otters?
* Why do you think it is so useful for elephants to have so many muscles in their trunks? (They have nearly 50,000.) Were you surprised to learn that some elephants wash their veggies before they eat them? What about the fact that baby elephants can eat their mum's droppings to gain helpful bacteria in their tummies?
* Pelicans are shown working together to herd fish into the shallows. They do their hunting early in the morning, swallowing the fish whole. How do you think they manage to go the rest of the day without eating? How does this contrast to the feeding style of an animal like the sea otter?
* Japanese snow monkeys are shown making snowballs and enjoying the hot springs. They also wash their sweet potatoes in salt water because it adds more flavour. What could this reveal about the animal kingdom? Can you think of any New Zealand animals that are known to do things for fun?

# *Task*: Make a Pinecone Bird Feeder: Look after the "fussy eaters" in your garden. As we head into cooler weather, the birds will be grateful for some fat and nutritious seeds.

1. Take a pinecone and tie a length of string around its middle.
2. Smear half the pinecone with peanut butter. (Unsalted is best for birds.)
3. Roll the peanut-butter side of the pinecone in wild bird seed mix. If you can't get hold of this, you can safely add rolled oats, sunflower seeds and small seeds such as millet seeds.
4. Hang the pinecone in a tree. Make sure it is in a place where the birds can visit without worrying about lurking cats.

Since introduced birds are the main eaters of seeds and fat in our gardens, you might also like to set up a native-bird feeding station, with sugar-water for nectar feeders like tui, and cut-up fruit stuck onto nails for fruit-eating birds like kereru.

#45 Mana Island

In fading light, a fairy prion returns to its roost on Mana Island as a host of nocturnal creatures are just beginning their day. After concerted conservation efforts, the island is now a hive of activity after dark.  <https://www.nzgeo.com/stories/mana-island/>

# *Talking points*: Discuss the ideas presented in the story

* In the photo of the wētā, what can you guess about its methods of getting food and escaping predators based on its body parts? Do you know what the indentations on its knees are for? (Hint—it's to do with one of the five senses.)
* Do you think this wētā is beautiful in any way? Which animals do you think might prey on wētā? Wētā were around at the same time as dinosaurs—does there seem to be anything dinosaur-like about it to you?
* Is there anything interesting you notice about the animals in the other photos, such as their colouring? What do you think Rob Suisted, the photographer, had to do to capture these photos? Have you had a go at wildlife photography, or would you like to one day? If so, can you think of a good way to practice?
* The Cook Straight giant wētā has become especially big because until recent centuries there was a lack of predators. Have you heard of "gigantism" in species before? Do you know of any other giant species? Did you know there is a giant earthworm north of Auckland that can be thicker than 10cm across and longer than a metre? Why do you think giant species are fun or interesting to a lot of people?
* Why do you think "nitrogen-rich guano" might be so helpful for supporting invertebrate populations on the island? What about the burrows dug by seabirds—why might these help invertebrates?
* To help seabird populations settle on Mana island, volunteers translocated about 700 baby birds and hand-fed them 11,000 meals with syringes. Why do you think people are so willing to go to all that effort? How do you think local people feel about Mana Island? Do you think islands like Mana have an impact on the native wildlife in the area around the island?

# *Task:* Make a tracking tunnel: Did you know you can make a simple tunnel to detect which critters are out and about in your backyard at night? You may find your tunnel is visited by rats, mice or hedgehogs. You might also be lucky and find some wētā tracks. (Have a look at the wētā's feet in the top photo in the article. What do you think wētā footprints might look like?)

1. Get a plastic lid, such as a margarine tub lid.
2. Fold a kitchen towel onto the lid and cover it with a solution of food colouring and water. It should be quite damp.
3. Place a dab of peanut butter in the middle of the tissue. This is what attracts animals to enter the tunnel.
4. Slide the lid into a cardboard tunnel—you can make the tunnel out of folded cardboard or use a square milk bottle with both ends cut off.
5. Place the tunnel outside in a sheltered place you think critters might visit. Add something as a waterproof cover—the lid of a plastic drum or bucket work. Make sure to check it in the morning!

#46 Australia

The epic journey of the world’s most arid continent has driven the evolution of its bizarre pouched mammals, [until Australia became the realm of marsupials.](https://www.nzgeo.com/mailster/381299/f7a85e039e39ba862728ac85d755fc82/aHR0cHM6Ly93d3cubnpnZW8uY29tL3ZpZGVvL2F1c3RyYWxpYS8/1) ??? [the producer of the video NHNZ has changed the rights on the video since we made the post making it unavailable in New Zealand]

# *Talking points*: Discuss the ideas presented in the story with your family—at home or over video conferencing. Find ways to involve as many people as possible, especially those who you know are isolated by the lock-down.

* The kangaroo is described as a "macro-pod"—we could translate this as a "big foot" or "a large hopping animal." Why do you think it is so important to red kangaroos, which live in the desert of Australia's interior, to be able to hop so well? What else did you admire about the red kangaroo?
* The koala sleeps for four minutes for every minute it's awake. The documentary explains that eucalyptus leaves are very high in fibre and low in protein, so the koala needs to use a lot of energy to digest its food. It also says that the koala's brain is very small—but this doesn't matter as the koala lives by keeping life pretty simple. How did you see the koala keeping life simple? In your opinion, what is it that makes koalas so appealing and cute?
* Dingoes are a threat to red kangaroos and other desert mammals. They have a strongly hierarchical society—their packs are ruled by a dominant pair. How might this survival strategy work well for dingoes as a species?
* The thorny devil-lizard has an interesting name. Having seen this creature, do you think it is well-named? What else could it be called, if you were going to give it an alternative name? It can eat 1000 ants in a day! How long do you think it might take to eat 1000 ants?
* The sugar-glider is a bit like a bat - it uses a membrane, rather than wings, to fly. What other animas is the sugar glider a bit similar to? How is it unique? The sugar-glider is a marsupial - why do you think Australia is the home of so many marsupial species?

# *Task*: Make a drawstring pouch. The kangaroo uses its pouch to keep its joey safe and happy. Make a pouch for your treasures with just a piece of fabric, a needle and thread!

1. Take a piece of fabric—thicker fabric such as felt would be ideal, or something with some stretch in it such as knit—but any fabric will work.
2. Draw a circle with a 10cm diameter onto the fabric with a felt or pencil.
3. Cut the circle out with fabric scissors (normal scissors will work but they are hard to cut neatly with.)
4. Thread a needle with strong thread. Sew big stitches around the edge of the circle, about 1.5cm in.
5. Pull the thread so that there is a long tail on both end. Tie them together about 25cm from the edge of the circle.
6. Pull the ends of the string so that the pouch closes. Now it's ready for your treasures!

#47 Shooting Stars

For stargazers, the clear skies over Tekapō afford a remarkable view of the heavens.

<https://www.nzgeo.com/stories/shooting-stars/>

# *Talking points*: Discuss the ideas presented in the story

* How do these photos make you feel? Are there any you particularly like?
* What do you think it's like to be a night-sky photographer? Do you think these stars are different to the ones above your house, or is it just the photographer's lenses and the dark sky that makes them look so different?
* The photo with all the pink and purple is of a star called Eta Carinae. It is 120 times bigger than our sun! Why do you think the sun looks bigger than all the stars we see at night, even though some of them are actually bigger? Did you know that stars have names? How do you think they get their names?
* Mount John is a great place to look at stars because of the nearby mountains, which make the region dry, and because of Lake Tekapo, which is thought to cool and stabilise the atmosphere. There is also a small population and the McKenzie District Council have passed laws to make sure streetlights don't impact night sky viewing. What do you think of the idea of a special place set aside for stargazing? Would you go there if you could? Do you think there should be more places set aside like this?
* Mount John Observatory is a base for astronomers from the University of Canterbury as well as Nagoya University in Japan. Can you think of any ways New Zealand and Japan might each benefit from working at Mount John together? What kind of discoveries might they make that could benefit our world?

# *Task:* Make a lantern: Do you know how to find the Southern Cross, or any other well-known stars or star systems? Maybe you can head outside to do some star-gazing in the next few nights. This decorative paper lantern is a fun way to celebrate the shorter days as we head towards winter and Matariki.

1. Take an A4 sheet of paper. Any paper will do but a heavier weight paper will work best.
2. Fold it in half. Cut slits at about 1.5cm gaps. Stop about 3cm short of the fold.
3. Open out the paper.
4. Tape the long sides together so the paper forms a cylinder. It will have a bend outwards halfway down where the fold was.
5. Poke holes at the top and string some wool through for a handle.

#48 Solar power

The sun powers our planet and provides us life. It’s as simple as that—though the processes can be mysterious and the applications surprising. In December last year, a bunch of Kiwis with a budget of less than $40,000 proved that it was possible to drive the length of the country using nothing but sunlight.

<https://www.nzgeo.com/stories/a-new-day-for-solar-power/>

# *Talking points*: Discuss the ideas presented in the story with your family—at home or over video conferencing. Find ways to involve as many people as possible, especially those who you know are isolated by the lock-down.

* By looking at the photos, what can you figure out about the design ideas behind the solar car in this article? Why do you think it is shaped the way it is? What challenges does it look like the creators faced?
* Solar-powered cars were first tried in the 1960s. In 1992, a solar car was driven from Cape Reinga to Bluff. But solar cars have not become mainstream. Solar works for powering light machines better than heavy machines and it is also unreliable as clouds and darkness stop the panels charging. Do you think car companies should keep investigating the use of solar panels? What do you think the future of cars might look like?
* Three University friends built this car together. They were trained in electrical engineering, mechanical engineering and boat building. What might it be like working with some friends on a major project like this? If you could build something big like a car, what would it be and who would you get to help you build it?
* The article describes how going downhill in the car is more like flying a glider than driving a car. What might it be like to be on the road in Solarfern? Would you feel scared or excited? Do you think the view might look different? If you were driving and you saw Solarfern, what would you think? How do you think people reacted when they saw Solarfern?
* In 2012 when this article was written, New Zealand spent $8 billion on fuel and $240 million on air-quality related health problems. Cars are expensive to run and not good for the environment. Can you think of any other ways cars are either positive or negative for us as individuals, or as a society? Have electric cars or other alternatives grown in popularity since 2012?

# *Task:* Explore shadows

1. Put a large piece of paper on the ground at the beginning or end of the day - both times when the sun makes interesting shadows.
2. Find some objects from the toybox or around the living room and play around with how the shape and size of the shadow changes when you rotate or tilt the objects.
3. You can also draw around the objects for some interesting art.

# 49. Raising Baby Gorilla

We're out of lockdown, but until school starts on Monday, still Together at Home. We won't leave you hanging... Enjoy the antics of two orphaned baby gorillas as they journey through their first year of life.

<https://www.nzgeo.com/video/gorilla/>

# *Talking points*: Discuss the ideas presented in the video with your family—at home or over video conferencing. Find ways to involve as many people as possible, especially those who you know are isolated by the lock-down.

* What were your favourite bits in this documentary? Do you know where Cameroon is in the atlas? Which other countries do you think might have gorilla populations? What do you know about these countries?
* How did you see the keepers interact with the gorillas? How did the gorillas respond? What did you notice about the bond between the humans and the gorillas? Are you surprised the gorillas still trust humans even after they have been hurt by them? Why do you think this is?
* Gorilla are described as being very sensitive. Rachel Hogan explains that an understanding of psychology is very important; they need to trust before they can be helped. What might this teach us about gorillas as a species? Does it help us understand humans in any way?
* A lot of orphaned gorillas have lost their families when they were shot for bush meat. Local children are brought to the sanctuary to meet the gorillas and learn about them. The hope is that children will learn to love and respect gorillas and choose not to eat bush meat. Do you think this is a good way to try to break the cycle of the bush meat trade? Can children influence their family's choices? Have you helped your family make any good environmental decisions, or would you like to?
* Gorillas are mostly vegetarians—they eat leaves and stems from at least 100 different plants. Do you feel surprised that such a powerful animal has a plant-based diet? Why might it be beneficial for them to forage from such a wide range of plants?

# *Task*: Save seeds and help make a healthier planet!

The gorilla's habitat is vital to their wellbeing. While logging can destroy habitat, we can learn how to make new plants for free by learning to save seeds. At this time of year in New Zealand, the bush and garden are full of seeds to gather. Go on a "seed hunt" today and bring home some seeds to plant!

1. Go looking for seeds. Some native seeds you might find could be harakeke or pittosporum seeds. Flowering plants such as lilies and lavender have seed heads or "hips" you can harvest.
2. Harakeke seeds can be planted straightaway in a small pot of compost or seed-raising mix. (If you don't have a plant pot, use a container such as a margarine container; just poke some holes in the bottom of it for drainage.)Some seeds have a little gel case around them and need to be dried. Spread them out on a tissue and leave them in a safe place. (You can harvest the seeds from a tomato just by squirting some of the pulp, containing seeds, onto a tissue.)
3. Look after the seeds you have planted by keeping the pot moist. It should sprout in a matter of weeks. Keep looking after the seedlings until they are strong and ready to be planted. These harakeke plants were planted from seed a year ago.

#50 South by Kayak

Pushing through a field of brash ice, an intrepid NZ expedition closes in on the bottom of the world. Their goal: the Antarctic Circle. Their route: wherever wind, wave and ice permit a passage along the western shore of the Antarctic Peninsula. Their means: three fibreglass kayaks and a fair measure of grit.

<https://www.nzgeo.com/stories/south-by-kayak/>

# Talking points: Discuss the ideas presented in the story with your family—at home or over video conferencing. Find ways to involve as many people as possible, especially those who you know are isolated by the lock-down.

* Why do you think people might feel excited about kayaking in Antarctica? Can you think of what some of the particular risks of kayaking here might be? How do you think the three men in this article prepared for the risks they were facing?
* The story opens with a hair-raising description of the men trying to land their kayaks in between breaking waves. Does their trip sound exciting or crazy to you? How do you think they camped once they managed to get ashore on landing spots? What would be some of the logistical challenges around camping in a trip like this? What environmental hazards might kayakers create for the landscape or animals?
* The men flew to Ushuaia, a city in Argentina, then went on board a boat to Antarctica. Ushuaia is the world's most Southernmost city. Do you know where Argentina is? How else do you think people might get to Antarctica?
* In the first ten minutes after setting off on their trip, the kayakers had encountered orca, heaps of penguins, a four-storey high falling ice cliff and slushy ice around their kayaks. The writer describes this as "sensory overload." What do you think they must have been thinking and feeling?
* The men mention camping near adelie and chinstrap penguins, Weddell, elephant and fur seals, skua gulls, sheath bills and snow petrels. They also saw orca and leopard seals. Which Antarctic animals would you be the most keen to see in the wild?

# Task—Make a moving picture

Re-create an Antarctic scene like this one of a leopard seal patrolling an ice-berg full of penguins.

1. Search the internet for "penguins on iceberg" to get some ideas about how to lay out your picture.
2. Draw an iceberg with penguins on it.  Leave plenty of room in the foreground for your moving leopard seal.
3. Cut a slit going across the foreground of the picture.  This will allow the seal to "pop up" and slide from one side of the picture to the other.
4. Draw the head and shoulders of a leopard seal.  (Use the internet to look at some pictures to help you.)
5. Cut this out and tape it onto an ice-block stick.  Poke it up through the slit and tell a story with the leopard seal and the penguins.

#51 Rena Accident - Black Tide

New Zealanders have become accustomed to sea freight slipping silently in and out of the country’s ports without incident. But on October 5, 2011, that impression of well-oiled efficiency foundered on Astrolabe Reef, and our coastlines suddenly seemed acutely exposed. What went wrong?

<https://www.nzgeo.com/stories/black-tide-the-rena-accident-and-its-implications/>

# Talking points: Discuss the ideas presented in the story

* The article starts with the writer visiting a virtual learning room where ship captains undergo training. The facilitator "dials up a storm" and visibility on the screen is reduced to near-zero. What do you think of this method of training? Does it sound like a good way to learn? How else do you think ship captains train for their jobs? Does being a captain or officer on a ship sound like a fun job to you or not?
* When the Rena hit Astrolabe Reef, she was damaged and 350 tonnes of oil spilt from her hull. This was pushed into shore by tides and landed in "gumboot sized gobs." Research shows that oil spills can affect ecosystems for up to 30 years. What damage might oil cause in water, in the rocks and sand of beaches, on the sea floor and in estuaries?
* What strikes you most when you look at the photos of the oil-covered birds? Why might it be very tricky to try to clean oil from birds? How do you think birds end up covered in the oil? How likely do you think it is that the birds could fully recover? What other creatures would probably be impacted by an oil spill?
* The article points out that we might hate the idea of a container ship being wrecked on our coast—but most of us want goods to be available at cheap shipping rates. When was the last time you or your family ordered something that had been shipped from overseas? Have you ever thought about the idea that when we try to buy things more cheaply, it can put pressure on suppliers or shipping/freight companies? Do you think consumers like us could consider ourselves partly responsible for disasters like the Rena, or do you think that it is solely the fault of the officers in question?
* The article talks about how the officers on watch may have lost their "situational awareness." This is a state of mind in which we become more focussed on what we are seeing and increase our ability to anticipate dangers and respond to them. What kind of careers might be particularly dependent on situational awareness? How could you get better at cultivating this skill within yourself?

# Task—Create a "lighthouse keeper's lunch" pulley system

Have you ever admired Mr Grinling's lunch-delivery system in the iconic book, The Lighthouse Keeper's Lunch? Now you can set up your own lunch-delivery system with a bucket, a rope and some string.

1. Read The Lighthouse Keeper's Lunch if you're lucky enough to have a copy.
2. Tie a rope between two locations—for example—the kitchen and the lounge, or the back deck and the trampoline.
3. If you have a pulley and a carabiner, attach a pulley to the rope and clip a carabiner under it, so your lunch-bucket can zoom along the rope attached to the carabiner. If not—just hook the handle of a bucket onto the rope, and tie a piece of string to the handle too, so you can pull the bucket towards yourself.
4. Get someone kind to put some snacks into the bucket and send it zipping towards you.
5. Enjoy your light-house keeper's lunch!

#52 Octopus – Deep Insight

# <https://www.nzgeo.com/stories/deep-insight/>

# *Talking points*: Discuss the ideas presented in [the story](https://www.nzgeo.com/mailster/396630/f7a85e039e39ba862728ac85d755fc82/aHR0cHM6Ly93d3cubnpnZW8uY29tL3N0b3JpZXMvZGVlcC1pbnNpZ2h0Lw/2)

* The author is called Dave and at the start of the article he gets up close to an octopus called Dave. He describes Dave the Octopus as being "beautifully equipped for entrapment and murder." What physical features can you see in these pictures of octopus that would help the species to trap and kill prey?
* "Engage with an octopus and you meet a mind of towering acuity." Acuity is sharpness or keenness. As a mollusc or soft-bodied animal, the octopus' keen mind is essential for its survival. How do you think the octopus' intelligence enables it to live differently to other marine molluscs (such as sea slugs, sea snails, pipi, mussels and scallops?)
* At the end of the article Dave Hansford writes that :the more we come to understand about octopuses, "the shakier become our traditional notions of intelligence and consciousness." Do you think octopuses could be capable of thought, in the way humans are? What makes you think they might or might not be?
* Octopus are incredibly curious—in aquariums they are often given toys to stave off boredom. The article also mentions that they could be well suited to aquaculture. How does this raise an ethical challenge for humans looking to possibly farm them for food?
* Would an octopus make a good pet? Would a human make a good octopus pet-owner? Why or why not?

# *Activity*: Paint a picture that highlights the octopus' predatory nature. We used watercolour paints but you can use any paint (or crayon, or felts) to create this picture.

1. Start with painting a crab in the bottom left-hand corner of the page. Use the colour yellow, as the octopus' eyes are also going to be yellow. The use of yellow eyes and a yellow crab helps the viewer to connect these two elements of the picture. It makes the octopus look as if it is staring hungrily at the crab.
2. Paint two large yellow eyes in the upper right corner, where the octopus' head would go.
3. Paint the outline of the octopus' head in red paint, arching over the eyes.
4. Add in eight tentacles. Some might be draping under or over others. When the yellow eyes are dry, fill the octopus in with a strong red. This colour "tells a story" of the octopus' fierce predatory nature, its muscular body and strong will. You can edge each tentacle on one side only with blue paint, to make them appear to stand out in 3D.
5. Wash blue paint over the background over the top third or so of the paper. Wash yellow paint over the bottom third or so of the paper, suggesting a sandy ocean floor. Paint the middle third in both blue and yellow, allowing them to mingle, creating a green effect that suggests seaweed and movement. Use blue to outline the crab to help it stand out from the yellow ocean floor.

#53 Bryde’s Whales in the Hauraki Gulf

If you live in Auckland—as your IP address suggests you do—the wild world on your doorstep is the Hauraki Gulf. It's complex ecosystem, beset with problems, and solutions that we don't feel like trying. And yet life goes on, especially the magnificent Bryde's whales. <https://www.nzgeo.com/stories/brydes-whales/>

# *Talking points*: Discuss the ideas presented in [the story](https://www.nzgeo.com/mailster/396769/e5bb74f451058bce1b8c4a3011207bc5/aHR0cHM6Ly93d3cubnpnZW8uY29tL3N0b3JpZXMvYnJ5ZGVzLXdoYWxlcy8) with your family—at home or over video conferencing. Find ways to involve as many people as possible, especially those who you know are isolated by the lock-down.

* The Bryde's whale uses its mouth like a butterfly net, scooping it through the water to catch tiny fish and krill then expelling the water back out. In the top photo, can you see the pleats that have expanded to make the whale's throat bulge out? How much water do you think it might be holding—a paddling pool full? A spa pool?
* In the top photo, there is a seabird and a dolphin near the whale. Why do you think these species are often seen together?
* Whaling took place at Whangaparapara on Great Barrier Island until the 1960's. This means that Hauraki Gulf whales were still being hunted when your grandparents were in their teens or 20's. Do you know how they felt about whaling? How have most people's attitudes to whales changed since then? What do you think influenced this change?
* Baleen whales can't choose what they swallow, so microplastics end up in their stomachs along with seafood. What do you know about how microplastics end up in the ocean, and how we can stop them getting there? Did you know that many microplastics start out as bigger pieces of plastic, such as rubbish, that breaks up into small pieces?
* Do you think most Aucklanders know there are whales in the Hauraki Gulf? Do you think one day we could end up with more whales in the Hauraki Gulf? What would we need to do to achieve this?

# *Activity:* Take action on microplastics!

Find the stormwater drain nearest to your house - start at your letterbox and turn downhill, or towards the nearest coast. Walk until you find a stormwater drain. Pick up any rubbish you find on the way.

Is there any rubbish resting on the grate of the drain? Can you see how in big rains, this rubbish would slip through the grate?

See if you can figure out how the water gets from the stormwater drain to the sea. Think about the direction of the nearest beach from where you are standing. You can use Google Maps Street View to help you figure out the nearest stream or culvert which leads to the beach.

Go on a longer walk if you can and pick up as much rubbish as possible—and feel great about having saved some marine animals from a nasty mouthful.

#54 Goat Island Marine Reserve - No Take Zone

Rolling a fresh cigarette, Bill Ballantine gives a sardonic laugh as he recalls the headline in the local newspaper when NZ’s first marine reserve was opened in 1977—“Nothing to do at Goat Island Bay any more.” Ballantine had fought for 12 years to protect five square kilometres of marine habitat on the Northland coast. That protection was finally in place. To Ballantine it was the start of a new era. To the newspaper, voicing community opposition, it was the end of one.

<https://www.nzgeo.com/stories/no-take-zone>

# *Talking points*: Discuss the ideas presented in [the story](https://www.nzgeo.com/mailster/397014/f7a85e039e39ba862728ac85d755fc82/aHR0cHM6Ly93d3cubnpnZW8uY29tL3N0b3JpZXMvbm8tdGFrZS16b25lLw/2) with your family—at home or over video conferencing. Find ways to involve as many people as possible, especially those who you know are isolated by the lock-down.

* Have you ever been to Goat Island, north of Auckland? Do you think it looks like a fun place to go for a school trip? How do you think you'd feel seeing lots of fish and seaweed when you put your face in the water?
* Goat Island represents a slice of "ordinary" coastline. Looking at the photos, does it seem ordinary to you? What are some of the differences you can see between these pictures, and the average beach? Would your nearest beach look like this if it was a "no take" zone for thirty years? How would you feel about it if it did?
* A lot of people disagreed with Bill Ballantine when he wanted to stop all fishing at Goat Island. Even the newspaper was very negative. Ballantine said it was a "lonely and uncomfortable fight" to keep pushing for the marine reserve. Why were people so angry? Are you glad he didn't give up?
* At the Poor Knights Islands, they tried outlawing only commercial fishing boats to allow recreational fishing to continue. People thought recreational fishing didn't affect fish stocks much. After 17 years, fish stocks were still declining and all fishing was stopped. The Poor Knights became a healthy ecosystem with big fish in it again. Could outlawing all fishing help a place like the Hauraki Gulf, where some fish stocks are close to extinct? What might stop the Government from acting to create more marine reserves?
* The article says that marine reserves help us to remember what the sea looks like when it is healthy. Without them we can forget, and think that low fish numbers are normal. What are some other good things that marine reserves do?

# Activity: Pretend to have a fire at the beach and cook some damper!

To make damper, rub 1 tsp butter into 1 cup of flour. Add 1 tsp baking powder and 3/4 cup of milk plus a pinch of salt and 1 tsp sugar. Mix it together.

Make an outdoor fire (always check your street address on the Auckland Council's website to make sure there is no fire ban before you make a fire.) Have a bucket of water handy so you can put it out. Use bricks to edge the fire so it stays in a small area. You will need newspaper, matches, very thin twigs and medium-sized twigs. Build upwards with scrunched up newspaper at the bottom, small twigs on top of that and medium-sized twigs pointing upwards in a pyramid shape.

When the fire has died down to low flames, find some medium-sized sticks and dip them into your batter. Hold the batter over the embers of the fire until it is cooked to a doughnut-like consistency. Do not put the batter into the flames—the heat from the flames will cook the batter if you hold it close.

Enjoy your damper and make sure you put the fire out properly before you go back inside!

#55 Peripatus – velvet underground

# Aliens among us. Velvet underground. If I could choose a super-power, shooting toxic snot from my mouth to digest my meal without the inconvenience of needing to chew would be right up there. Also, having 15 pairs of legs would have some advantages. <https://www.nzgeo.com/stories/velvet-underground/>

# *Talking points*: Discuss the ideas presented in the story with your family—at home or over video conferencing. Find ways to involve as many people as possible, especially those who you know are isolated by the lock-down.

* Looking at the photos, what creatures does the peripatus remind you of, and why? Do you think it looks like a "subterranean soft toy?" Would you have one on your bed?
* Scientists say the peripatus is similar in some ways to arthropods, and similar in other ways to annelids. Do you know what either of these groups of animals are? How does it seem similar to each of them?
* When you read the description of how the peripatus shoots glue onto its victim before pulverising its innards, can you imagine the peripatus being like a creature from science fiction? What is the best/most interesting/creepiest part of this description?
* Peripatus usually don't travel far from home, often only ranging a few metres from their hiding spot. This has meant there are lots of quite different peripatus species spread out across Aotearoa. Each one is suited to its local environment. What might be some of the ways their bodies and habits differ?
* Had you heard of peripatus before reading this article? Why do you think they are not more well-known? Are there any other interesting leaf-litter species that you think deserve to be more well-known?

# *Activity*: Do a leaf-litter bioblitz in your garden or a local reserve.

Take an ice-cream container, or something like a small hoop that you can use to mark out an area in your garden.

Go outside and find a place under the trees that should have some interesting decomposing leaf-matter in which invertebrates could hide.

Place your ice-cream container upside down and wiggle it gently so it makes a clear square mark. (Or, place the hoop down as a marker.) This shows the area you are searching in.

Gently disturb the soil or leaf litter and carefully look for creatures. Can you identify what you see? A magnifying glass may be useful. You could draw pictures of anything you find, or take photos, and try to identify them. Write down how many of each species you find.

You can do another search in a different area (what might be different about the creatures you find under an apple tree, or a native tree, or in the chicken run?)

#56 Tiritiri – Bird Island

... for some. Take our ground-based native bird species, for instance... They'd be lost on the mainland, but have found safety in lockdown on offshore islands. Maybe you've been lucky enough to go to Tiritiri Matangi? If not, journey along with us today... <https://www.nzgeo.com/stories/bird-island/>

# *Talking points* : Discuss the ideas presented in the story with your family—at home or over video conferencing. Find ways to involve as many people as possible, especially those who you know are isolated by the lock-down.

* At the beginning of the article, the author describes getting off the ferry at Tiritiri and seeing tui, whiteheads, quail, robins, kingfisher, bellbirds, stitchbirds, kākāriki, kōkako, kererū and takahē. Have you seen any of these birds in real life before? Are there any you'd love to see? Which ones are unusual on the mainland?
* The "loud, ringing," bird song on Tiritiri is compared to what Joseph Banks wrote about when he travelled around Aotearoa with Captain Cook on the HMS Endeavour. Why might bird song have been so much louder before Europeans began to emigrate to New Zealand? Do you hear much bird song at your place?
* Tiritiri was at one stage a "bare island," having been farmed. In the black and white photo of Tiritiri before it was replanted, are you surprised by how little vegetation there is? What would have been the challenges of farming an island so bare of vegetation?
* Birds fly between Tiritiri and other islands in the Hauraki Gulf. Which other nearby islands do you know of where revegetation projects have provided habitat for birds?
* Are there any revegetation projects near your house or school? Have you seen the way planting provides habitat for birds and other creatures? Have you ever wanted to start a "reveg" project of your own? What could you do to get this started?

# *Activity*: Make a seed-bomb

Firstly, you need seeds. Walk around your garden or local reserve and check the native trees and shrubs. You might find some karo or pittosporum seeds, hebe seeds and coprosma berries.

Dig up some clay from your garden (about a tablespoonful is plenty.) This is like the glue in the seed bomb.

Take a small amount of garden soil or potting mix. (Half a teaspoonful or so.)

Squish the soil, seeds together and clay together into a ball.

Let it dry for a couple of days. Now you're ready to give it to someone for a gift, or to throw it (hence the name "seed bomb") onto an area that would benefit from native plants. Keep an eye on it and see if any of the seeds sprout up in spring time!

#57 Kiwi Bushman

# Going bush. Josh James reinvents adventure and manhood on the West Coast, with the world watching.

<https://www.nzgeo.com/stories/the-kiwi-bushman>

# *Talking points* : Discuss the ideas presented in [the story](https://www.nzgeo.com/mailster/397334/e5bb74f451058bce1b8c4a3011207bc5/aHR0cHM6Ly93d3cubnpnZW8uY29tL3N0b3JpZXMvdGhlLWtpd2ktYnVzaG1hbi8/2) with your family—at home or over video conferencing. Find ways to involve as many people as possible, especially those who you know are isolated by the lock-down.

* Do you enjoy watching families on YouTube? Have you ever watched The Bushman Family? What does it sound like it's about?
* From looking at the photos in the article, what aspects of living in this family look fun or exciting to you? Does anything look challenging or unpleasant? How does their part of New Zealand look different to yours?
* A lot of people watch YouTube videos about Josh James' family and wish they could have the same lifestyle. Why do you think this is? Why do people who live in cities often wish they could move away? What are some of the things this family has to do without?
* Josh James has been the star of a Discovery Channel program and has lots of followers but he has to work hard. He learns as much as he can about making videos, and spends hours producing them. Is being a YouTube star a job that is easy to succeed at? What could be some of the down sides of the job?
* Josh James talks about how it's "so important for kids to take responsibility, to do things without being asked, and to realise they're capable of a lot already." Are those things that you feel are valued in your family? How about at your school? Why do you think these things are good for kids?

# *Activity*: Cook up some wild food from the garden

You are very likely to have onion weed growing at your place. Look in shady spots for a clump of green strap-like leaves. Onion weed plants look a bit like daffodils and a lot like snowdrops, but a difference is that each stalk has three corners rather than being rounded. The final test is to break a bit off and smell it—does it have an onion or garlic smell? If so, it's onion weed and you can eat it.

**Onion weed fry-up**

* Harvest some onion weed leaves and wash them..
* Chop them into small pieces.
* Heat up some olive oil in a frying pan.
* Sauté the onion weed pieces.
* Add a cube of chicken stock for flavour.

They will taste like tender, sweet pan-fried leeks. You can also eat onion weed raw, adding it to smoothies and salads. It is full of vitamins, minerals and antioxidants. In spring, when the plant produces flowers, you can pick them to add to salads—they have a crunchy texture. The onion weed bulb is also edible

#58 Turtles

# Stuck at home Here's a lockdown life-hack... wear your home on your back like a turtle and you can travel anywhere!  Sea turtles survived a meteor that killed the dinosaurs, millions of years of predator attacks, even the slow warming of the seas, only to be threatened by nylon fishing lines and plastic bags. Those that wash up in New Zealand almost always need the help of humans.

# <https://www.nzgeo.com/stories/return-of-the-ancients/>

# *Talking points*: Discuss the ideas presented in [the story](https://www.nzgeo.com/mailster/397633/e5bb74f451058bce1b8c4a3011207bc5/aHR0cHM6Ly93d3cubnpnZW8uY29tL3N0b3JpZXMvcmV0dXJuLW9mLXRoZS1hbmNpZW50cy8/2) with your family—at home or over video conferencing. Find ways to involve as many people as possible, especially those who you know are isolated by the lock-down.

* Which of these photos are your favourites? What do you think are some of the beautiful, or interesting things about turtles?
* Turtles have survived incredible changes to their environment but the article points out that it is the plastic bag that may prove to be the most devastating change yet. Who do you think is responsible for making sure plastic bags don't get into the ocean—individuals or the government? Why?
* The article describes all the amazing care offered to sick turtles that end up on New Zealand beaches; antibiotics, incubators, special food and so on. It can take them up to two years to recover. What do you think it is like for the people who care for these sick turtles? How might it feel for them when a turtle was eventually released into the wild?
* A lot more turtles are turning up in New Zealand waters. The article points out that they need a healthy habitat with seagrass and algae to eat. Do you know what is needed for seagrass and other plants to thrive in our harbours? What role might sedimentation and pollution play in suppressing seagrass?
* Is there anything to do with turtles that you want to find out more about? Are there any actions you could take to make life better for the world's turtles?

# *Activity*: Paint a swimming turtle - Use the photo of the turtle, photographed from below, as inspiration for this painting. We used watercolours but you could use any medium to create the light and dark effects.

1. Firstly, paint the outline of a turtle in the middle of your page. Follow the shape of the turtle in the photo. Notice the shape of the front flippers and the back flippers—they are quite different to one another.
2. Secondly, fill this outline in with the darkest blue you can make.
3. Thirdly, paint a dark blue border.
4. Fourthly, using a lighter blue wash, bring this border inwards in a circular shape around the turtle.
5. Fifth, using the lightest wash you can, paint right around the edge of the turtle. You can use a tissue to blot around the edges if the paint needs to be lightened.

#59 Kawau Island

# Let's visit Kawau...Many Aucklanders know Kawau Island, but how many know it's truly weird history? In a succession of difficult postings—South Australia, New Zealand, South Africa—the energetic George Grey proved himself one of the British Empire's most able governors. Yet when he returned to New Zealand in 1861 for a second term, the magic was fading. The colony was on the brink of civil war, and local politicians were unwilling to allow Grey his former power. As an escape from the increasing pressure and frustration of public life, Grey purchased Kawau Island, building a grand house there amid exotic gardens and filling it with treasures. On the centenary of the death of Sir George Grey—soldier, statesman, explorer, philanthropist—we pay a lingering visit to Mansion House. <https://www.nzgeo.com/stories/the-governors-island/>

# *Talking points*: Discuss the ideas presented in the story with your family—at home or over video conferencing. Find ways to involve as many people as possible, especially those who you know are isolated by the lock-down.

* Do you know much about the British Empire? Which countries were in the British Empire? What was the idea behind the Empire? Why did it stop being powerful after a while?
* From looking at the photos of the house and gardens, what do you think you can tell about Sir George Grey? Do you like his taste in furnishings? Do you like the look of the gardens? How about the architecture of the house? Do you think you would enjoy living in Mansion House?
* Sir George Grey brought zebra, monkeys, peacocks, wallabies, kookaburra and many other species to Kawau. Do you think this is a fun idea or a crazy idea? What could be some of the dangers or downsides of having your own menagerie?
* Grey's first job was as a soldier in Ireland. He had to go around collecting English tithes (payments) from poor Irish people. If they didn't pay up, he was supposed to threaten them with a sword. He didn't like the job and the article says it awakened "a lifelong desire to serve common humanity." What do you think this means? Do you think by the end of his life he had served common humanity?
* Grey thought it was a noble mission to explore Australia in search of land to which poor British people could emigrate and thereby escape poverty. This view didn't consider the impact on the Aboriginal people who were already living in Australia. Why didn't Grey think this through?

# Activity : Have fun playing around with architecture and build a simple dwelling.

1. Use prunings from the garden to build a miniature home. At this time of year your household may have been pruning fruit trees or shrubs.
2. Get help to snip a number of even-sized twigs and slim branches. You really do need an adult to help you with this as secateurs are very sharp.
3. Use hot glue to arrange them into a structure. You might like to make a cube shape first and then fill the walls in with twigs like a log house.
4. What shape will your roof be—flat or sloping? Try making support beams, or rafters to strengthen the roof.
5. If you can, add in a doorway and windows.
6. You can add mud, lichen, bark or any other material to fill in gaps and make the house more weatherproof and attractive.

#60 Spotted Shags

# Fake it 'til you make it. Sick of being stuck at home? Why not build a new fake one? Seabird scientists are creating a fake home for shags on the Noises, an island group off the coast of Auckland, in the hope that the Hauraki Gulf’s rapidly diminishing spotted shag population will be fooled into thinking it’s a great place to start a family.  <https://www.nzgeo.com/stories/where-are-all-the-spotted-shags/>

# *Talking points* : Discuss the ideas presented in the story with your family—at home or over video conferencing. Find ways to involve as many people as possible, especially those who you know are isolated by the lock-down.

* Have you seen a shag (cormorant) before? You might have seen one dive below the water then pop up again suddenly, perhaps you've seen one holding its wings out wide to dry. Did you know that there are several types of shag in New Zealand, in addition to the most commonly known pied shag?
* What do you find noticeable or surprising about the pārekareka or spotted shag in the photos? Can you see any similarities between the shag's plumage and the guano-covered rocks?
* Writing in her diary from her Noises Island bach, Marlene Neureuter described spotted shags as being "so elegant—like city gentlemen in their grey suits." Would you describe these birds as elegant? What other describing words or comparisons could fit them? What kind of personality do they look like they would have?
* The article quotes from a book in which the author describes seeing fishermen sit and shoot at shags until hundreds lay dead in the water. He thinks the fishermen were just amusing themselves, or saw the shags as competition for fish. How does that story make you feel? Why do you think it was allowed to happen? What might have led the fisherman to be so casual about the shags?
* Anchovies in the Hauraki Gulf are estimated by one fisherman to be down to 2 or 3% of their previous levels. Shags rely on fish like pilchards and anchovies so many shags are literally starving. Do you have any ideas about how we could boost pilchard and anchovy populations?
* Another major challenge to the shag's food supply is sedimentation clouding up the water after it rains, making it harder for seabirds to catch fish. What are the causes of sedimentation in Auckland's marine environment?

# *Activity:* Make a Damien Hirst–inspired spotted shag picture - Damien Hirst has often explored painting with masses of colourful spots. Check these out by using a search engine to look up "Damien Hirst dot art."

1. Draw the outline of a spotted shag standing on a rock. Look at the photos in the article for inspiration. Notice any details as you draw, such as the tuft of feathers at the back of the head.
2. Prepare a palette of bright coloured acrylic paints (or use another medium such as felt tip if you prefer.)
3. Fill in the outline of the shag with a variety of coloured dots. You can make these even or more random, closely spaced or more spread out.
4. If you want to, add in details such as the shag's green eye-patch and the splash of white on the back of the head.
5. To create the look of guano in the background, paint a background of brown rock, then squirt white paint from the tube onto the brown rock. Drag it around with the prongs of a fork.

#61 Fantail

The fantail is one of our commonest native birds, loved for its flamboyant tail, acrobatic flight and inquisitive friendliness. Yet life is no bed of roses for these charming little birds. Between August and February each year they pour their energy into reproduction, only to have almost all of their infant offspring devoured by rats and other predators. <https://www.nzgeo.com/stories/silence-of-the-fantails/>

# *Talking points* : Discuss the ideas presented in the story with your family—at home or over video conferencing. Find ways to involve as many people as possible, especially those who you know are isolated by the lock-down.

* Do you like fantails? How often would you say you see them? What have you noticed about them—such as the way they fly, the noise they make, or their colouring?
* What surprises or shocks you about the top photo of the rat eating the baby fantail? What can you learn about the capabilities of rats as predators from the photos? Do you trap rats or mice at your house, or at school? Do you know if any of your neighbours do?
* The article says fantails use moss, grass, rotting wood and cobwebs to make their ice-cream cone shaped nests. Can you see any of these materials in the nests in the pictures? Why might cobwebs be useful in nest-building?
* Fantails snap their beaks shut on their prey and swallow them immediately—the article says you can hear their beak snapping if you listen carefully. What would be a good way to try and hear this for yourself. How could you set yourself up in the garden or at a park to do some serious birdwatching?
* Morepork also prey on fantails—what do you think of the photo of a morepork seizing a fantail? Do you feel differently about the morepork as predator versus the rat as predator?

# *Activity*: Origami Fantail

1. First, take a piece of paper that will look good in a fan shape. Artwork or a nice piece of sturdy wrapping paper will work well. We also tried using pages from an old book that was headed for the op-shop.
2. Fold into small pleats—holding the paper away from you and pressing down, then flipping it over so it faces towards you and pressing down.
3. Unfold the pleats and you have a fan. You can tape the pleats together into a handle at the base.
4. Now you need the body of a bird to attach to your fan "tail." Use your imagination—we tried cutting a body shape from an old book to match the fan tail. We also tried balling paper up to make a 3D body with a smaller head. What might you think of?

#62 Auckland Domain – Auckland’s Green Heart

# Our green heart: Let's learn about something close to home—at the centre of our city... In 1845 Governor George Grey set aside 80 hectares of central Auckland for a park. On the crest of an ancient volcano, it is a memorial, a recreation space, a green heart for the city and its citizens. <https://www.nzgeo.com/stories/aucklands-green-heart/>

# *Talking points* - Discuss the ideas presented in the story with your family—at home or over video conferencing. Find ways to involve as many people as possible, especially those who you know are isolated by the lock-down.

* Have you ever been to the Auckland Museum? If you have, do you remember any of these places—the duck ponds? the winter-gardens? the band rotunda? the cricket pitch? the canons and other war memorials? Do you have any favourite memories of trips to the museum or domain?
* Looking at the photos in the article, what kinds of things do people do at the museum/domain grounds? If the 80 hectares of the domain had never been made into public land, what do you think might be there today?
* There is a photo of a huge tree at the top of the article. Its leaves are turning yellow and starting to fall. What do children appreciate about trees like this? What would you do if you could play under (or in) this tree? What could be some of the nice things about this tree in each season—spring, summer, autumn or winter?
* What do you think the author means when he says the domain is "Auckland's heart and lungs?"
* Did you know that the domain is an ancient volcano, or that its name is Pukekawa? Ngāti Whātua lived in a pa on Pukekawa. The volcanic soil was good for growing food, there was a wetland where the cricket fields are now, and water flowed from a spring where the duckponds are now. (The sea was also closer at hand in those times, before the land was extended in harbour reclamation works near Mechanic's Bay.) Do you think it's interesting to learn about how things used to be? Does knowledge of history change how we behave or think about places?

# Activity: Bark Rubbing - Deciduous trees like the large ones at the Auckland Domain are still bare at the moment—their spring foliage will burst out soon. For now, they are making intricate shadows and we can really pay attention to their bark and the lichens that grow on them.

1. Take a piece of paper and some crayons.
2. Hold the paper up against the trunk of the tree.
3. Hold the crayon on its side, rub the crayon up and down.
4. Frame your rubbing with a home-made frame and write the name of the special tree underneath it neatly, if you want to.
5. Make sure you take some time to look at the beautiful winter shadows that trees are casting on the ground at the moment.

#63 Auckland Zoo – New Zooland

**At the zoo.** We've changed our minds about what zoos should be over the past generation. Let's visit Auckland Zoo to figure out what we've learned... At Auckland Zoo there’s an elderly primate whose unobtrusive presence and minimalist surroundings understate her sig­nificant role in our history. Isolated from the other chimps, she looks lonely, but this is her choice. She doesn’t get along with her fellow primates and prefers her solitary enclosure to their park-like surroundings. When her long-time friend, Bobbie, died four years ago, Janie, 58, became the last of the famous tea party chimpanzees.

<https://www.nzgeo.com/stories/new-zooland/>

# *Talking points*: Discuss the ideas presented in [the story](https://www.nzgeo.com/mailster/398744/e5bb74f451058bce1b8c4a3011207bc5/aHR0cHM6Ly93d3cubnpnZW8uY29tL3N0b3JpZXMvc3VnYXItZGVhci8/2) with your family—at home or over video conferencing. Find ways to involve as many people as possible, especially those who you know are isolated by the lock-down.

* What are your favourite parts of your local zoo? Do you have a favourite animal? What do you love about it? Has your favourite animal changed since you were younger? What feelings do you have when you are watching your favourite animal?
* When you look at the top photo of the three chimps having a tea party in front of the audience, what do you think? Does anyone in your family remember going to see these chimps having their daily "tea party" at the Auckland Zoo—or perhaps riding on the elephant in the 1950s?
* The tea party and elephant rides were stopped in the 1970s as people began to think differently about how we should treat captive animals. We began to feel we were exploiting animals. Do you agree that we should have stopped? Why or why not?
* In the 1970s the chimps and other animals at the Auckland Zoo were given massive habitat changes. Instead of a small concrete enclosure they were given large, leafy enclosures. How might this have affected the chimp's well-being? What has changed again since the 1970s—for example what do you think might be some of the new features of the new South East Asia primate enclosure that opened this year at Auckland Zoo?

# *Activity*: Make a baby rhino out of clay - A baby rhino has just been born at Auckland Zoo. Celebrate by making your own!

1. Take a small amount of clay, either a shop-bought clay such as air-dry clay, or home-made salt-dough.
2. Make a large potato shape for the body, a small one for the head, and four legs.
3. Gently press the legs and head onto the body and shape it with your fingertips.
4. Look at photos of the baby rhino to help you get the proportions right.
5. Add ears, eyes and nostrils. Using the blunt end of a kebab stick is a good way to help with these details.
6. Let your rhino dry and paint it if you want to.
7. Make sure you give it a name!

#64 The Kermadecs - Blue Water Islands

A thousand kilometres north-east of the mainland, the Kermadec Group basks in a subtropical environment and two decades of marine protection. In May this year, scientists scoured this untouched world to catalogue, collect and expand the list of species found there, and discovered an ecosystem unlike anything else in the country. <https://www.nzgeo.com/stories/blue-water-islands/>

*Talking Points*: Discuss the ideas presented in the story with your family—at home or over Zoom. Find ways to involve as many people as possible, especially those isolated by the lock-down.

* The Kermadec Islands lie between New Zealand and Tonga. If you find these places on a map, can you imagine a line of underwater volcanoes stretching between them for thousands of kilometres? Draw your own map if you want to.
* The tips of some of these volcanoes jut out of the water, making islands, while others are totally underwater and still others are “caldera” or basin-shaped. Could you draw a picture that showed these three types of volcanoes? If you think of New Zealand volcanoes, can you name one that is an island, an underwater or a caldera volcano?
* “Beneath the surface, a whole new context is revealed. The islands are mere mountain-tops, part of a mighty line of volcanoes which mark another meeting place—one of tectonic plates, where the Pacific Plate is subducted beneath the Australian Plate.” Can you use your hands to show how the Pacific Plate is subducted under the Australian Plate? See if you can find out what happens to a plate when it is subducted and gets closer to the earth’s core.
* “These islands in the middle of nowhere have attracted life, from everywhere. And not just fish—there are corals, sea urchins, algae, crabs and all manner of other plants and invertebrates.” Which of the images of residents of the Kermadecs did you find beautiful or intriguing?
* Allison Ballance says the Kermadecs are a “reference library for the near-magical symbiosis of an ecosystem in balance, lest we forget.” What do you think she is trying to suggest when she calls the Kermadecs a reference library? Why might she have used a well-known war-commemoration phrase to end her article?

*Language Focus***:** Birdlife at the Kermadecs. Seabirds wheel and swoop, glide, dive and screech, in greater density over the Kermadecs than anywhere else in New Zealand. They dominate the terrestrial ecosystem as well: the cliffs and shores of craggy outlying islands are honeycombed with burrows and in places snowed with guano. Some burrows are just five centimetres across, others have yawning entrances half a metre wide and extend three metres into the cliffs. On the Herald Islets, seedlings in the forest understorey do silent battle for space with seabird burrows and nests covering every available patch of earth.

1. In the first sentence, which five powerful verbs describe the activity of seabirds?
2. The islands are “honeycombed” with burrows and “snowed” with guano – what do these metaphors help us imagine?
3. What is suggested when we imagine a “yawning” entrance?
4. The passage says the seedlings “do silent battle for space.” Why is it such a battle?

(Answers: 1. Wheel, swoop, dive, glide, screech. 2. Lots of small burrows; a white covering of guano. 3. A large wide entrance. 4. They do silent battle because there is hardly any spare earth to grow in due to all the nests and burrows.)

# *Video*: Guardians of the oceanfish_3- Ricardo Christie and Jo Holley call themselves guardians of the ocean. And they’re calling on more New Zealanders to do the same; to learn about the immense pressure being placed on our marine ecosystems and exert some pressure of their own on politicians so we can protect what remains. [Watch the video](https://www.nzgeo.com/video/guardians-of-the-ocean/), then ask yourself; why does something as powerful as the ocean need us as guardians? Is the ocean more powerful or less powerful than humans, and why?

# *Activity*: Create your own colourful fish. Create your own beautiful colourful fish using whatever you can find around the house.

You will need:

* 9 large paper plates
* Scissors
* Hot glue gun
* Craft brushes in a variety of sizes
* Paper cupcake cups
* Some paint

Step 1: Start with some plain white paper plates. These plates are 26cm in diameter. Use scissors to cut out fish shapes from 7 of the paper plates, such as the mouth and fins.

Step 2: Use the 2 left over plates to cut out the tails. Cutting the plates into quarters was a good start for the tail shape. Cut the tail into the final shape you want and attach it to the fish body with a hot glue gun. Paint the fish with whatever you have to hand.

Step 3: Fold paper cupcake cups into quarters & paint these for the fins and use hot glue to attach the fins to the fish

Step 4: You can attach the fish to the wall with blu tack.

#65 Southern Right Whales - The whales are back

Last century, southern right whales were hunted until there were none left—none that we could find. A small group of these whales, also called tohorā, hid from the harpoon. Deep in the subantarctic, the survivors birthed and nursed their young. Now, tohorā are returning to the coasts of New Zealand. Are we ready for them? <https://www.nzgeo.com/stories/the-whales-are-back/>

# *Talking points*: Discuss the ideas presented in the story with your family—at home or over video conferencing. Find ways to involve as many people as possible, especially those who you know are isolated by the lock-down.

* Bill Morris describes how the truck-sized whale comes down to the level of the divers to look at them and later, returns for a second look. What might the whale be thinking? What might you be feeling if you were one of the divers?
* Would you like to do a job like Emma Carroll’s or Rochelle Constantine’s, going out in research boats to track whales? What kind of challenges or rewards might their jobs involve? What does the photo of Emma Carroll suggest the work is like?
* Are you surprised that it only took two generations for right whales to be virtually wiped out? To what extent do you think they will be able to recover? What actions have humans already taken to help?
* What do you think of the special role of a tohunga tororā or whale rider, someone like Ramari Oliphant-Stewart who is especially close to nature? What might be some of the neat things about being a whale rider? What might be challenging?
* Did you know about the story of a whale that accompanied the Tainui waka? How do you think the presence of this whale might have affected those on their long journey from Hawaiki to Aotearoa?

# *Activity*: Silhouettes- Right whales are as unique as humans—each 1 has their own pattern & personality. Make your own portrait on wood with this silhouette craft. Use a photo of someone in your house, or download a photo of a right whale and paint this instead, for a beautiful celebration of our oceans.

You will need: Photos of your kids, yourself, pets, etc; Wood; Whatever paint you can get your hands on; Pencil; Scissors; Small craft paint brushes

**Step 1:** Take profile photos of your kids (or yourself, partner, family members, pets etc) standing side-on against a plain wall/background. Measure your pieces of wood and using a computer, re-size your photos so that they will fit on to your wood.

**Step 2:** Print out your photos and carefully cut them out, or even trace them off a screen. Using double-sided tape, stick them to your piece of wood. Using a pencil, draw around your head cut-outs on to the wood.  
**Step 3:** Using a small, fine craft paint brush, paint the outline of the head using your chosen colour. With a bigger paint brush, fill in the interior of the head. Repeat until all the silhouettes are complete.

Top tip: Consider painting each silhouette in that person’s favourite colour

# *Video*: Marine Mammal Rescue - Better Ancestors visits Project Jonah, the New Zealand charity that empowers local people to help at whale and dolphin standings—to provide aid to these majestic animals when they need us. NZ has one of the world’s highest rates of whale standings—the beaching of sometimes hundreds of whales at one time. [Watch the video](https://www.nzgeo.com/mailster/432824/e5bb74f451058bce1b8c4a3011207bc5/aHR0cHM6Ly93d3cuYmV0dGVyYW5jZXN0b3JzLm9yZy92aWRlb3MvcHJvamVjdC1qb25haC1tYXJpbmUtbWFtbWFsLXJlc2N1ZS1iZXR0ZXItYW5jZXN0b3JzLWVwLTI0Lz90PTI4MTU5XzZjZTM4NDA2ZGI5NDJlMjNkOTcxMzc3NTNiYmFjZWYwJmNhbXBhaWduX2lkPQ/1), then ask yourself; what do you notice about the ways that whale strandings affect volunteers? What does it seem humanity may be learning through our involvement with whales?

#66 Spiders - Eight legs, two fangs and an attitude  
Frequently feared, but mostly misunderstood, spiders have a dazzling repertoire of behaviour, and engineering skills which are unmatched in the animal world. <https://www.nzgeo.com/stories/eight-legs-two-fangs-and-an-attitude/>

# *Talking points*: Discuss the ideas presented in the story with your family—at home or over video confer-encing. Find ways to involve as many people as possible, especially those isolated by the lock-down.

* Do you agree that we are taught to be afraid of spiders through nursery rhymes, myths and movies? What examples can you think of? Are spiders ever given a “good” reputation?
* What did you think about the behaviour of Margaret, the woman with arachnophobia? What were the things you found most interesting about how her phobia affects her life?
* One of New Zealand’s most famous spiders, the Avondale spider, “immigrated” here on timber being brought in from Australia. With its legs stretched out, it measures 20cm. You might like to find a ruler and look at how big 20cm is. Do you think it is likely that a live spider ever stretches its legs out to reach this size? Why or why not? Avondales are unusual in that they live communally - what do you think the advantages of this might be? What about disadvantages?
* Did you learn anything new about the spider’s anatomy, from the paragraph that starts “As children we are taught that spiders have eight legs…”? Which of these adaptations do you think might have allowed spiders to become such a highly successful species?
* In the paragraph that starts “It’s dinner time at our house…” the writer goes into detail about how a grey spider interacts with its prey. Were there any surprises in this description? Do you feel any differently about spiders after reading this description?

# *Language Focus* : “Spiders are the lions and tigers of the arthropods—there is not a vegetarian amongst them. They make their living by stalking or trapping their victims, subduing them with venom injected through hollow fangs, dissolving their soft tissues with powerful digestive juices and then sucking out their liquid lunch.”

1. In the first line, what is the effect of the comparison between spiders and lions and tigers?
2. What do you think is the effect of the phrase “there is not a vegetarian amongst them?”
3. In the second sentence, can you find five gruesome verbs?
4. In the second sentence, can you find two or more words with negative connotations?
5. In the second sentence, can you find three or more adjectives that build up a picture in the readers’ mind?

Answers: 1. The comparison to lions and tigers helps us imagine the spider as a powerful and as a carnivore/meat-eater. 2. It adds humour because being vegetarian is something we associate with humans. 3. Stalking, trapping, subduing, injected, dissolving, sucking. 4. Venom, fangs or any of the verbs in the previous answer. 5. Hollow, soft, powerful, liquid

# *Activity:* Rock Turtle - Any smooth rocks lying around at your place? Grab some paint and make a cute rock animal for your garden. You could make a friendly spider or a turtle like the one in this project.

You will need: 6 stones; Small craft brush; Your choice of colours; Bamboo skewer

**Step 1:** Find 6 garden stones. These will form the shape of a turtle.

**Step 2:**Paint the stones all over.

**Step 3:** Use a darker colour to paint polygon shapes on to the largest stone for the shell. Use the blunt end of a bamboo skewer to paint dots on to the flippers and head. Choose whatever colours you like!  
**Step 4:**Paint the eyes with a dark colour.

#67 Migrations - Where the Seabirds Go

During winter, dozens of seabird species take flight from New Zealand on epic migrations across the planet—and recent advances in tracking technology mean we can now follow them. What we’re learning has upended scientists’ ideas about the lengths animals will go to in order to raise a family.

<https://www.nzgeo.com/stories/where-the-seabirds-go/>

# *Talking points*: Discuss the ideas presented in the story with your family—at home or over video conferencing. Find ways to involve as many people as possible, especially those who you know are isolated by the lock-down.

* What seabirds do you most commonly see in your day-to-day life? How many different sea birds are you aware of? Do you agree that most New Zealanders are not aware of how many seabirds breed here - 14 types of albatross and over 70 types of seabird?
* The Bounty Islands are described as "granite stacks devoid of vegetation, their entire surface peppered with tens of thousands of seabirds." Looking at the picture of one of these stacks, do you think you can imagine visiting the Bounty Islands? What might you smell and hear? How do you think the birds survive without vegetation?
* What do you learn about seabird activity from the world map that looks like it is covered in scribbles? What was your reaction to seeing this information?
* At the end of summer, seabirds head to regions of the Pacific where water masses meet. They are drawn to the "hyper-fertile" waters here that are rich in phytoplankton. What do you think hyper-fertile means? Why might the birds and other creatures be feeding intensely at this time of year?
* Tawaki (a penguin species) travel up to 1,000km per week. That's roughly the driving distance between Cape Reinga and Wellington. The article uses the words "extraordinary" and "insane" to describe these journeys. What are your thoughts? What do you think might drive this intense activity, since scientists are not sure of the reason for it?

# *Language Focus:*

"As we gingerly move through the menagerie, the big birds shuffle nervously on their nests, briefly revealing ivory-coloured eggs beneath their downy breasts. Occasionally, they stand up to stretch, unfurling the full 2.5-metre span of their wings. The sky above is thick with albatrosses, which loop in with sublime grace only to land with all the delicacy of a bag of golf clubs."

1. Why do the writer and his companion move “gingerly”?
2. Which phrases show you that the birds are uncomfortable with the visitors?
3. Why do you think the writer includes the measurement of the albatrosses’ wingspan?
4. What is implied by the description “the sky above is thick with albatrosses?”
5. The albatrosses land “with all the delicacy of a bag of golf clubs.” What does this show about them

Answers: 1. They are trying to be very careful. 2. "the big birds shuffle nervously." 3. The measurement helps us to visualise their huge size and feel impressed. 4. There are a lot of albatrosses in the air. 5. They are clumsy when they land.

# *Activity*: Cloth Bags - Brighten up some boring bags with this “handprint” art

You will need:

* Some cloth bags x 2
* Stiff cardboard
* Paint in your choice of colours
* Medium and small craft paintbrushes
* Willing hand participants

First, iron your bag and then cut a piece of cardboard big enough to fit inside the bag. This keeps the bag taught and flat and stops any paint from bleeding through to the other side.  
**How to paint a bird bag**

**Step 1:** Use a pencil to mark where you want the handprints to go. Use a medium-sized craft paintbrush to paint on to the hand.

***Top tip:***apply two layers of paint. The first layer of paint dries quickly due to the heat of the hand. Be liberal with the second layer of paint—this layer won't dry so quickly as the first coat acts as an insulating layer.

**Step 2:** Carefully put the hand in position and press down firmly, making sure to apply equal pressure to the whole hand and each finger so that a good handprint is made. Remove the hand by peeling it off in a rolling motion.

**Step 3:** Use a small craft paintbrush to fill in any areas, such as the hole made with the palm of the hand. Add eyes, beak and branches. Allow the bag to dry before using.

**How to paint a ladybird bag**

**Step 1:** Use a pencil to sketch out your bug shape and then use a medium-sized craft paintbrush to paint in the outline using your chosen colour. Use the same paintbrush to fill in the whole area.

**Step 2:** As with the first bag, paint on two layers of paint onto the hand and press it down firmly.

**Step 3:** Use a small craft paintbrush to paint on the antennae, wing spots and flight path. Allow the bag to dry before using.

***Top tip:***For a little extra bling use metallic paint for some of the extra details. You can also use footprints for extra variety.

#68 Fungi - The underground forest

Buried in the soil are the lattices and networks of another kingdom of life, one that’s inextricably connected with what grows above the ground. Fungi determine the types of trees that thrive, and change the quality and health of soil. So, what exactly are they up to down there—and what powers do fungi have that humans could harness? <https://www.nzgeo.com/stories/the-underground-forest/>

# *Talking points* : Discuss the ideas presented in the story with your family—at home or over video conferencing. Find ways to involve as many people as possible, especially those who you know are isolated by the lock-down.

* Fungi are “inextricably” connected with what grows above the ground. What do you think this means?
* After reading about the symbiotic relationship between trees and fungi, are you able to put into your own words the ways that trees and fungi help each other?
* Do you think the annual fungal foray looks like a fun way to spend a weekend? Would you enjoy carefully looking on the forest floor for different species of fungi? Why do you think people get hooked on it?
* Did you know there are so many species of fungi (one volunteer at Fungal Foray found 600 in a weekend) and that they are so different from one another? Scientists are still figuring out why there is such great diversity in the fungal world – do you have any hypotheses about how we might come to value the properties of different fungi in the future?
* The harore is a native species of Armillaria mushroom – it spreads out into a vast network and can stop trees from growing. What do you think about the possibility of this helping to stop the spread of wilding pines? What will scientists have to consider as they look at using harore this way?

# *Language Focus*

“Today, though, we’ve struck it lucky. There are little armies of gold mushrooms and dark-red conical ones, clusters of little gnome hats and branching coralline fungi, all in the earthy, nostalgic colours of old New Zealand: the browns and creams of Crown Lynn ceramics, the tan of suitcase leather and old armchairs, the pale pink found inside a conch shell.”

1. Can you spot the personal pronoun in the first sentence? Do you know why writers often use personal pronouns in non-fiction writing?
2. Can you find a sound technique in the first sentence?
3. “Little armies” could be said to be an unexpected combination of words – almost an oxymoron. What do you think these two words together conjures up in our minds?
4. There are lots of specific colours mentioned as the writer describes the fungi he sees. Which colours can you find? Why do you think he bothers to mention all these?
5. What kind of words are “earthy” and “nostalgic?”

Answers: 1. The personal pronoun is “we’ve” – these help create a warm and personal tone so the reader can relate to the writer. 2. “Struck it lucky” is a sound technique and uses consonance in the repetition of the “uck” sound. This makes the writing more lively. 3. “Little armies” helps us imagine the fungi as clustered in a group and working together in an impressive way, as well as emphasising their small size and making them seem like they belong to another, fairy-like world. 4. Colours include gold, dark-red, brown, cream, tan and pale-pink. This list of colours helps us to imagine how beautiful the fungi are as well as admiring their diversity. It helps us understand how enchanted the writer is by what he sees on the forest floor. 5. Adjectives - describing words.

# *Activity*: Your own toadstool - Make & paint a beautiful garden decoration that celebrates magical toadstools.

**You will need:**

* Clay (Use air-dry clay if you have it, or make salt-dough, recipe below)
* Red and white paint, or any colours that you choose

**Step 1:** Make a batch of salt-dough by mixing ½ cup flour with ¼ cup salt. Add ¼ cup of water to this and stir until combined in a dough.

**Step 2:** Divide the dough into five portions and shape each into a ball. Use your fingers to pinch the top of the ball and draw out a stem.

**Step 3:** Bake at 180 degrees Celsius for 20 minutes or until hard.

**Step 4:** When cool, paint the stem and underside of each toadstool in white and the topside in red. Use a small paintbrush or the end of a kebab stick to dot white spots onto the red topside.

**Step 5:** If you have mod podge or another clear varnish, apply it to the dried paint.

**Step 6:** Place in a terrarium or pot-plant or outside in the garden.

#68 Lampreys - Blood suckers

New Zealand's lampreys have done without bones—even jaws—for 360 million years, making do instead with a mouthful of rasps designed for shredding. But those teeth are no match for a new and invisible enemy. Are pesticides killing the lampreys? Scientists are scrambling to find out. <https://www.nzgeo.com/stories/blood-suckers/>

# *Talking points*: Discuss the ideas presented in the story with your family—at home or over video conferencing. Find ways to involve as many people as possible, especially those who you know are isolated by the lock-down.

* The top image of the lamprey is pretty spectacular – can you see the eye, the “circular, murderous-looking maw of hooks, which is used to fasten to prey,” and the “tough, mechanical rasp of a tongue which scrapes away scales and skin to get to the tissue below”? If you could invent a new name for the lamprey, what would you choose?
* The article says that lampreys have been around since the “dim mists of the Devonian” – do you know about any of the major developments of this period of prehistory, or which other animals are associated with what is sometimes called The Age of the Fishes? Do some investigating if you’d like to know more.
* The lamprey and its relative, the hagfish, are mentioned as being the only two species out of 45,000 marine animals that never developed jaws. How have they managed without them? See if you can find out how the hagfish manages without them. Find out what a “relic” is if you can.

# *Language Focus*: “Today, though, we’ve struck it lucky. There are little armies of gold mush-rooms & dark-red conical ones, clusters of little gnome hats and branching coralline fungi, all in the earthy, nostalgic colours of old NZ: the browns and creams of Crown Lynn ceramics, the tan of suitcase leather and old armchairs, the pale pink found inside a conch shell.”

1. Can you spot the personal pronoun in the first sentence? Do you know why writers often use personal pronouns in non-fiction writing?
2. Can you find a sound technique in the first sentence?
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* awning grounds.” Can you explain in your own words why hydro power stations are challenging for lamprey looking to spawn? What do you think we could do to fix this problem?
* Ecologist Jane Kitson is quoted as saying “I’ve never seen anything so beautiful, yet so strange. It’s almost as if they’re not from this world.” Looking at all the photos in the article, could you possibly agree with Kitson that lamprey are beautiful? Do you think we should take action to preserve such a strange creature – why and/or why not?

# Activity: Striped vases - Bring the best of the 70s to your vase collection with this retro-inspired colour scheme. You will need:

* Glass vases
* Masking tape
* Paintbrush
* Primer (if you have it)
* Paint in your choice of colours

Step 1: Use a primer to paint a basecoat on the vases and leave to dry. If you don't have any, just whack on a top coat and wait for it to dry.  
Step 2: Tape up the sections for the stripes.  
Step 3: Paint the stripes, using our example as a guide. As there are various colours, you'll end up painting some of the stripes and leaving them to dry, and then masking off for the other stripes and painting them. Remove the low tack masking tape and allow to fully dry.  
Step 4: Your vases are ready to be filled with the fresh seasonal flowers and foliage.

# #69 Auckland Volcanic field - The fire beneath us

New Zealand’s largest city sits atop an active volcanic field that has erupted at least 53 times in the past 250,000 years. The catastrophic blasts felled forests and set the Auckland isthmus alight. The fire-fountaining cones and lava flows rode roughshod over the land. Scientists are not wondering if it will happen again, but what it will cost Auckland in lives and infrastructure when it does.

<https://www.nzgeo.com/stories/volcanic-auckland/>

# *Talking points*: Discuss the ideas presented in the story with your family—at home or over video conferencing. Find ways to involve as many people as possible, especially those who you know are isolated by the lock-down.

* The Auckland volcanic field has erupted at least 53 times in an estimated 250,000 years. In your opinion, is this a lot, or not that much? Are there other parts of New Zealand where people live right beside volcanoes? Do you think we take a reasonable risk building cities in a place like this, or is it crazy? (To help you consider this, it might help to know that Rangitoto is the youngest volcano, forming about 600 years ago, and Maungarei/Mt Wellington is the next youngest, forming about 10,000 years ago.)
* An isthmus is a narrow strip of land, surrounded by two bodies of water and connecting two larger land masses. What are the two bodies of water on either side of the Auckland isthmus? What are the larger land masses that are on either end of it? Do you know how long it takes to walk from one side to the other of the Auckland isthmus to the other?
* Looking at the picture of the lava cave with people standing in it, are you surprised to learn that there are 17 lava caves in the suburb of Three Kings alone, and many more within the Auckland area? Can you put into your own words the process by which lava caves are created? Why do you think most of these are closed to the public? Should they be?
* The Auckland Volcanic Field pops like a pot of porridge. Each time a vent opens up in a volcanic explosion, it closes afterward, so the magma pops in a different place the next time. How might this reassure someone who is visiting an Auckland volcano? How might it provide a challenge for scientists?
* At the end of the article, it’s emphasised that even in a big eruption like the one that formed Rangitoto, only part of Auckland’s population would need to evacuate, not the whole city. How do you think citizens would be supported if they were required to evacuate? In the sidebar with the title “Flashover,” what do you learn about how things like ash, lava and rockfall affect a city’s infrastructure?

# *Language Focus*: “Ice ages sap Auckland of its warmth. More than once, a strange white ash sweeps in from rhyolite detonations around Taupō. Local rivers, and even the Waikato, change course with the ease of rainwater down an umbrella. Within that same time span the Auckland isthmus pops and boils like a pot of porridge.”

1. What does the verb “sap” suggest happened to Auckland’s warmth in the ice ages?
2. Find two adjectives in the second sentence and explain their effect.
3. What is the metaphor used to explain waterflow in the third sentence?
4. What language features is used to create an image in the fourth sentence?
5. Why do you think the writer uses a series of shorter sentences in this paragraph?

Answers: 1. It disappeared quickly. 2. Strange, white…these adjectives make it sound spooky. 3. “the ease of rainwater down an umbrella.” 4. A simile. 5. The short sentences give the writing the feeling of a list so that we feel we are learning about all the different events of the volcanic field. This emphasises time passing.

# *Activity*: Volcano cupcakes - Get your volcano-inspired craft on with one of these ideas

**Option 1:** Make volcano cupcakes- Bake cupcakes with a recipe of your choice. Decorate with red and yellow “lava” icing.

**Option 2:** Paint with straws to make an erupting volcano- Paint a cone in dark colours and place globules of red and yellow paint at the top of the cone.  
Use a straw to blow directly onto the globules of paint and push it upwards out of the cone.

# #70 Possum—an ecological nightmare.

Brushtail possums are a protected species in their native Australia. Across the Tasman, they have established themselves as NZ’s most voracious and intractable pest, attacking simul-taneously the beauty of our forests and the good name of our farming products.

<https://www.nzgeo.com/stories/possum-an-ecological-nightmare/>

# *Talking points*: Discuss the ideas presented in the story with your family—at home or over video conferencing. Find ways to involve as many people as possible, especially those who you know are isolated by the lock-down.

* This article was written when possums were at their peak in New Zealand – when there about 70 million. Have a quick look at the Predator Free NZ website to find out how many million there are in New Zealand today. [https://predatorfreenz.org/resources/introduced-predator-facts/possum-facts/](https://www.nzgeo.com/mailster/434092/e5bb74f451058bce1b8c4a3011207bc5/aHR0cHM6Ly9wcmVkYXRvcmZyZWVuei5vcmcvcmVzb3VyY2VzL2ludHJvZHVjZWQtcHJlZGF0b3ItZmFjdHMvcG9zc3VtLWZhY3RzLw) How many might there have been by now if there hadn’t been several decades of trapping, shooting and poisoning to control the population?
* In the first side-bar, “A Tale of Two Possums,” we read that there are three types of mammals – placental mammals, egg-laying mammals (such as the duck-billed platypus) and marsupials (including possums.) Can you find out a bit more about each of these types of mammal?
* The writer points out that possums are as cute as teddy bears – big dark eyes, a furry pouch and a habit of holding food in its hands like a person as it munches. How do you feel about possums? Do you find them adorable or not? Do you think New Zealanders generally feel differently about the cuteness of possums than Australians, for whom possums are not pests?
* Can you imagine a big container ship full of leaves and green matter leaving our shores every night, as described in the paragraph about possums eating 21,000 tonnes of leaf matter every 24 hours? Now that the possum population has lessened, how could you adjust this image to reflect the impact of our current possum population?
* What is your reaction to the description of the New Zealand bush in the Auckland Acclimatisation Society’s report from 1917, which said that “We shall be doing a great service to the country in stocking these large areas of rough bush with this valuable and harmless animal.” Why might they have seen the bush as empty, and possums as valuable and harmless?

# *Activity*: Paint your own shoes- Add some fun and personality to a pair of plain shoes with some paint and some masking tape! You can try colour-blocking as in the example below, or try decorating your shoes with pictures and words.

You will need: Clean shoes, Paint, Masking tape

**1** Carefully cover any rubber edges with masking tape.

**2** Use masking tape to add a design to your shoes, such as the ‘V’ shaped design in this photo.

**3** Paint areas one at a time

**4** When one colour dries, add masking tape to the edge of it so you can paint another section with clean lines.

**5** Carefully remove masking tape from the sole.

# #71 When birds get sick

Diseases can take a huge toll on wild animals and hasten rare species towards extinction. In New Zealand, scientists, vets and conservation volunteers are teaming up to try to beat the viruses, parasites and fungi threatening some of our rarest bird species.

<https://www.nzgeo.com/stories/when-birds-get-sick/>

# *Talking points*: Discuss the ideas presented in [the story](https://www.nzgeo.com/stories/when-birds-get-sick/)with your family—at home or over video conferencing. Find ways to involve as many people as possible, especially those who you know are isolated by the lock-down.

* In your own words, can you explain why tūturuatu ended up living on Rangatira Island, in the Chathams, instead of all around mainland New Zealand? What is the problem with them living only on this island?
* Are you surprised to read that one rat wiped out all 70 tūturuatu on Mana Island, when the Department of Conservation was trying to establish the species there? What does this anecdote highlight about both rats and native birds?
* Conservation workers collect eggs from wild populations such as those on Rangatira Island, to increase the gene pool of captive-bred birds. Why is this so important?
* Why do you think someone with an international profile in the scientific community, like Miguel Quiñones-Mateu, would volunteer to help save the hoiho?
* Hoiho numbers have dropped from 600 breeding pairs to just 165 in just over 10 years. When you read through the list of possible reasons why, do you have any suggestions about ways humans could step up their efforts to help the hoiho? How might Covid-19 have helped the species recover? How does the article say it has been unhelpful?

# *Activity*: Noughts and Crosses Game- Make your own noughts and crosses game with these cute painted rocks. You could swap out the ladybirds and bees for some native birds such as hoiho and kākāpō.

**You will need:** Similar-sized rocks or shells, A flat board, Paint, Paintbrushes – fine and thick, Ruler, Pencil

**Step One:** Collect 10 rocks or shells of a similar size and shape.  
**Step Two:** First, paint each rock with an undercoat, if you have some.  
**Step Three:** When the undercoat is dry, paint each rock with a dark colour such as black.  
**Step Four:** For the bumble bees, use a small dry paint brush to apply yellow paint in small short brush strokes to form three stripes. For the ladybirds, use a red or colour of your choice to paint two wings.  
**Step Five:** Next, paint the detail of the wings. Use a very fine paintbrush to paint two wings on to the bumble bee using white. For the ladybirds, use black to paint spots on to the wings.  
**Step Six:** Make the eyes by painting two white ovals, with a smaller black circle in each for the pupils.  
**Step Seven:** To make the game board, cut a piece of plywood into a 27cm x 27cm square and paint in a dark colour.  
**Step Eight:** Using a ruler and pencil, measure out a grid with lines 9cm apart. Use a thin paint brush and your choice of paint to paint on the lines.

#72 Glow-worms

# In the heart of the Waikato there’s a multimillion-dollar industry based on a gnat. Glow-worms are big business, attracting well over half a million people a year to Waitomo and prompting some to shift from working the land above ground to commercialising the creatures below it. But keeping the caves and their thousands of tiny performance artists in good health requires round-the-clock care. <https://www.nzgeo.com/stories/rock-stars/> *Talking points*: Discuss the ideas presented in [the story](https://www.nzgeo.com/mailster/434369/e5bb74f451058bce1b8c4a3011207bc5/aHR0cHM6Ly93d3cubnpnZW8uY29tL3N0b3JpZXMvcm9jay1zdGFycy8) with your family—at home or over video conferencing. Find ways to involve as many people as possible, especially those who you know are isolated by the lock-down.

* Did you know that the insects we call “glow worms” are actually the larvae of fungus gnats? Did anything surprise you in the description of their appearance or lifestyle?
* Do you think you would have chosen to see the glow worms by boat, on foot down the spiral pathway, or by abseiling down the 35m hole as the writer does? Why?
* Using the photo of the glow worm with its sticky net as a guide, see if you can explain how glow worms (fungus gnat larvae) catch their food.
* Some of the statistics about how much industry surrounds the Waitomo glow worm populations might have surprised you – for example, that 130 people work as guides and that the larvae are counted every half an hour. What do you think might be challenges for the tourism companies operating at Waitomo?
* Improving the water quality of the streams and land that surround the caves has led to healthier glow worms. Does that surprise you? What does this finding suggest in terms of the relationship between what is under the ground and what is above the ground?

# *Activity*: Paper plate dinosaurs - From some paper plates and cardboard rolls, create these adorable dinosaurs - a perfect addition to the bookshelf of a dinosaur-lover.

**You will need:** 3 paper plates (26cm diameter works well); Scissors; Hot glue gun; Your choice paint colours; Craft brushes in a variety of sizes; 2 Cylinders of cardboard such as kitchen towel rolls

**1** Use scissors to cut two of the paper plates in half.

**2**  Use the third plate to cut out shapes for the dinosaur’s head and tail. If you don’t have a third plate you can use scrap cardboard, such as an old cereal box.

**3**  Attach the head and tail to the body with a hot glue gun and paint the dinosaur.

**4**  Paint the dinosaur’s eyes – you can use the end of your paint brush for making small spots like eyes.

**5**  Cut your cylindrical cardboard rolls into quarters. Cut two slits halfway down on opposite sides of each piece.

**6**  Paint these. Once dry, push the dinosaur bodies into the slits of the cardboard tube legs. You can secure them with hot glue if need be.

#73 Rising Sea Levels

# With predicted increases in sea level of a metre or more by the end of this century, present-day problems of coastal erosion, flooding and salt-water intrusion into groundwater are going to get much worse. As world leaders gather in Paris to seek a political solution to climate change, it’s timely to ask how we in NZ are responding to the challenge of rising seas. <https://www.nzgeo.com/stories/three-feet-high-and-rising> *Talking points*: Discuss the ideas presented in the story with your family—at home or over video conferencing. Find ways to involve as many people as possible, especially those who you know are isolated by the lock-down.

* Looking through the photos in this article, which of them do you find interesting or surprising? Would you be ok to live in the houses that are pictured? This week West Auckland experienced flooding – have you seen any of the photos of the West Auckland floods in the news? Have you been surprised by the extent of the flooding? Why might it have occurred?
* The article features a couple in Mokau who have a beachfront property because the sea washed away the road and the property that used to be in front of theirs. Earlier this year “a tennis-court-sized slab of land” was “gulped by the sea overnight.” Can you imagine waking up to see that kind of change? How do you think it’s possible for the sea to “gulp” so much land – how might that happen?
* The spit where Bev and Ray Christiansen live “should never have been developed” – the government pushed ahead with a subdivision in 1956 despite being warned by geologists that it would be likely to erode. What do you think might be reasons that governments and councils allow developments to go ahead despite this kind of advice? Do you think it still happens today?
* Sixty-five percent of New Zealand’s communities and infrastructure live within five kilometres of the sea. Why do so many New Zealanders live on or near the coast? Do you think we should continue to build houses in the same way or should we make some different choices? What ideas do you have about how we could build in a way that would work around sea-rise?
* Can you explain how we could expand our approach to looking after our coasts by adopting the Māori concept of “ki uta ki tai” - mountains to sea?

# *Activity*: 3D Art Owl- Create this stunning night-time inspired wall art with some stones, twigs and canvases.

**You will need:** 2 artist canvases (sturdy cardboard, shoebox lids or wooden offcuts would also work); Your choice of paint; Paint brushes; Stones; Twigs; String; Scissors; Scrap cardboard; Bamboo skewer

**Step One:** Start by painting the two canvases in your choice of colour.

**Step Two:** Position the twigs on the canvases, trim them as needed and glue them in place using a hot glue gun.

**Step Three:** Cut a short length of twig and use string to make a swing. Glue this in place with the hot glue.

**Step Four:** Glue the stones in place.

**Step Five:** Cut some small triangles out of scrap cardboard and glue these in place for beaks. Use a dark colour to paint on the eyes. You can use the blunt end of a bamboo skewer to get the small dots for eyes. Paint on the legs and feet. Try using the sharp end of the bamboo skewer to paint on the thick lines.

**Step Six:** For the gold and stars, paint some spare cardboard and once dry, use scissors to cut out in the shape of small stars. Glue these to the canvases with hot glue.

#74 Volunteer Fire Fighters

Gaza, Beetle, Lily and Jaq, Inky, Tootle, Shrek and Skippy—every town and community has them. They style themselves as ordinary people but their lives and service are anything but ordinary. Unpaid and unheralded, they are our first line of rescue in 65,000 emergency calls a year, routinely saving the lives and assets of people they don’t know. <https://www.nzgeo.com/stories/volunteer-firefighters>

# *Talking points* : Discuss the ideas presented in the story with your family—at home or over video conferencing. Find ways to involve as many people as possible, especially those who you know are isolated by the lock-down.

* Did you know there are volunteer firefighters in New Zealand? Have you ever heard the loud siren that is used to alert them to callouts? Why do you think we need volunteer firefighters as well as paid firefighters?
* What did you think about the firefighters helping the woman give birth? How do you think it could be helpful for someone to have a team of people there, instead of being on their own? Are there many parts of New Zealand where the ambulance would take 30 minutes or more to get to a callout?
* The article describes how busy most volunteer firefighting stations are. The commitment is heavy – regular callouts as well as training. Why do you think people are willing to make this commitment? What do you think they find rewarding about the work?
* The training exercise sounds intense – full Goretex fire suits, breathing apparatus, 70 degree heat, darkness and a heavy firehose, as thick as a forearm. How does this sound to you – do you think you would enjoy this kind of challenging exercise or not?
* What do you think of the idea that the playground is modelled on the adult volunteer’s training set-up – with bridges, swings and crawl-throughs. Would you be keen to play on this sort of playground? How might it appeal to the children of firefighters?

# *Activity:* Fun lolly jars: Insert a bit of farmyard fun into the kitchen or kids' bedroom by creating animal storage jars, perfect for squirreling away lollies, buttons or bits and bobs. These jars also make cute gifts when filled with homemade sweet treats.

**You will need:**

* Small detail brushes
* Clear-drying extra strong glue
* Primer undercoat if you have it
* Paint in your choice of colours

**Step One:** Choose three small animal figurines and three small glass jars with lids. Wash and dry the plastic figurines to make sure they are clean and ready for painting. If your jars are also second-hand, then give them a thorough wash and clean too. Carefully apply super strong glue to the feet of the animal figurines and place them on the lids of the jars. Leave to dry completely.

**Step Two:** Once the figurines are glued on to the lids, use a very small brush to apply paint to the entire animal figurine and lid. Apply two coats, waiting for each one to dry in between.

**Step Three:** Fill the jars with lollies (or buttons, coins, etc) and reattach the lids. These make great party favours or small gifts, simply add a decorative ribbon or name tag.

#75 The Great Retreat – above the bushline

Some species just like it cooler. Others have withdrawn little by little to higher altitudes, making new homes where it’s too cold for their enemies to follow. But warmer seasons allow predators and diseases to gain ground and advance above the bushline—meaning that the alpine zone is no longer the refuge it once was. <https://www.nzgeo.com/stories/the-great-retreat>

# Talking points: Discuss the ideas presented in the story with your family,at home or over video conferen-cing. Find ways to involve as many people as possible, especially those isolated by the lock-down.

* Looking at the top photos, are you surprised that these mountain peaks are a habitat for any kind of animal, let alone a bird like the rock wren?
* The third photo shows a female rock wren in her very beautifully-wrought nest. Are you surprised to read the statistics in the caption, about how many eggs and chicks were preyed on by stoats? What other animals could be likely predators for the rock wren?
* Researcher Susan Walker describes a “carpet of rodents” appearing after a summer and autumn where flowers and trees have fruited heavily. What does this image suggest to you? Are you familiar with the term “mast year?”
* What do you think is meant by the statement that stoats are “Ice Age champions?”
* The images show the beautiful cascade gecko and an alpine weta. The remains of both species have been found in the stomachs of stoats. Butterflies, moths, flatworms, snails, grasshoppers are also preyed on by stoats. How do you think we might be able to help protect these species?

# *Activity*: Painted Trinket Bowls - Turn scratched and worn wooden bowls into a home for trinkets and jewellery using paint test-pots. **You will need:**

* Small wooden bowls or dishes... even single-use plastic cups.
* Sandpaper fine grit
* Painter’s masking tape
* Primer and test-pots in your choice of colours

**Step One:** Gently sand the bowls. Wipe clean with a dry cloth.

**Step Two:** Prime with a coat of primer, if you have any, to ready the surface for top-coating.

**Step Three:** Paint with two coats of the base colour. Leave to dry between coats.

**Step Four:** To create the multi-coloured bowl, use painter’s masking tape to divide the bowl in half then another piece of tape to create a wedge shape. Paint the wedge with two coats of your second colour, leaving it to dry between coats. Remove tape and apply another piece to create the third wedge.

**Step Five:** Paint the third wedge with two coats of your third colour, leaving it to dry between coats. Remove tape and fill with jewellery – enjoy!

#76 The great retreat – under the ice

Antarctica’s fragile ecosystem is a barometer for the warming and acidification of Earth’s oceans. Over the last decade, NIWA scientists have been diving under the ice as part of Project IceCUBE to gauge just how the ecosystem might cope with these threats. <https://www.nzgeo.com/stories/under-the-ice>

Talking Points: Discuss the ideas presented in [the story](https://www.nzgeo.com/mailster/435054/f7a85e039e39ba862728ac85d755fc82/aHR0cHM6Ly93d3cubnpnZW8uY29tL3N0b3JpZXMvdW5kZXItdGhlLWljZS8/2) with your family—at home or over video conferencing. Find ways to involve as many people as possible, especially those who you know are isolated by the lock-down.

* Questions missing

# *Activity:* Firefly Creations - Using expired pasta, paint & a sprinkle of creativity, the pasta-bilities are endless. These easy-to-make bugs are a great way to use up leftover pieces of pasta at the back of the cupboard. **You will need:**

* Paint in your choice of colours
* Wooden beads or blanched peanuts
* Large pasta shells or real seashells
* Pasta bow ties
* Bamboo skewers
* Small craft googly eyes
* Hot glue gun
* Small craft brush

**Step One:** Assemble your supplies. If you don't have these exact items get creative with other items in your home.

**Step Two:** Begin by painting the pasta shells in your first colour.

**Step Three:** Paint each of the pasta bow ties in different colours.

**Step Four:** To make the head of the firefly, use a hot glue gun to glue a wooden bead, or half a blanched peanut, to the end of a long bamboo skewer.

**Step Five:** To make the wings, glue the pasta bow ties underneath the head. Make the body by gluing the pasta shells on underneath.

**Step Six:** Finish the firefly by gluing on two googly eyes onto the head. Or you could paint them on using black and white paint

#77 Tiny house

The idea of minimal living, an international fad, has fallen on fertile soil in NZ, thanks to our national housing crisis and shifting ideas about the way we want to live. For some, a tiny house is the only home they will ever afford to own. Others are stepping off the treadmill of modern life to ask: How much space does a person really need? <https://www.nzgeo.com/stories/tiny-houses>

# *Talking points* : Discuss the ideas presented in the story with your family—at home or over video conferencing. Find ways to involve as many people as possible, especially those who you know are isolated by the lock-down.

* Of the tiny homes in the images, can you pick a favourite? What are some of the features you find appealing? Anything you’d change?
* In what ways do you imagine life might get “easy, and meaningful” as one tiny home owner said it does, after moving into a tiny home? What challenges can you envisage?
* Do you like the idea of letting more nature into our housing spaces – such as by moving the shower and toilet outdoors? What about the idea that architecture should intensify our experience of nature – not shelter us from it? Is this a practical idea? How might it change a family’s/individual’s behaviour?
* Do you think that building your own house would feel meaningful? How might it affect your relationship with where you live? Are there any negatives you can think of?
* What might it be like to live in a community of tiny houses, with shared public spaces in between them? What do you think could be benefits and downsides of this concept?

# *Activity:* Make a Tent. Create a tiny home on your living room floor with this amazing tent! ****You will need:****

* 4x 1.5m battens (drilled holes in each, one top and one bottom, to insert dowels)
* 3x 1.2m dowels
* Paint in your choice of colours
* Calico or an old sheet; 1.5m length, 1m width
* Sewing kit
  1. Paint the battens and dowels and leave to dry.
  2. Paint a pattern onto the calico or sheet. We used potato printing was used; cut a shape such as a star in relief on one half of a potato, dip it in paint and stamp it repeatedly over the fabric.)
  3. Make an A frame with the dowels and pine boards. Get it to the width and height you’d like it.
  4. Place the (dried) calico on top of the tent, and make each side taut. Sew along the bottom of the tent to secure it to the dowel on each side. Ask someone to hold the frame while you do it.
  5. Fill the tent with cushions, fairy lights or bunting and have fun!

# Tiny homes Tiny Home owner Matthew Lillis shows us around his home and describes what being a part of the supportive Tiny Home community has meant to him.  Everett Norris, a Tiny Home builder, explores the concept of adding nothing to our lives except what builds on the four pillars of meaning, connection, security and health, and how living tiny enables these. [Watch the video](https://www.nzgeo.com/video/tiny-homes/), then ask yourself; how do you see the four pillars of meaning, connection, security and health as coming into play within the building and living processes of the Tiny Home movement?

#78 Curling

Curling requires perfect weather conditions for its national tournament, the bonspiel, to take place. For the first time in 84 years, the frosts aligned and New Zealand’s gathering of curlers returned to the Central Otago town where it all began in 1879. <https://www.nzgeo.com/stories/the-roaring-game/>

***Talking points*:** Discuss the ideas presented in [the story](https://www.nzgeo.com/stories/the-roaring-game/) with your family—at home or over video conferencing. Find ways to involve as many people as possible, especially those who you know are isolated by the lock-down.

* Have a look at the photos. What countries do you think curling might be popular in? What makes you think that? What do you predict about the uniform and the rules of the game?
* A bonspiel is a curling tournament. Are you surprised to learn that 300 people turned up for the bonspiel in the article, even though they only had two days’ notice to do so? What do you think makes the bonspiel fun and interesting for so many people?
* Sportsmanship is important in curling – if you swear on the ice, take a sip of ginger wine at the wrong time or arrive late, you can be penalised. What do you think of this?
* Another part of the game is the curler’s attitude, which is to try to win but not to humiliate their opponent. The writer calls this “Arthurian.” Have you read any of the King Arthur stories and do you know about the code of chivalry among knights? Do you think this chivalric attitude would ruin the game for you or not, if you were curling?
* Why do you think the Curlers’ Court is such a secretive affair? How might this add to the excitement of the bonspiel? How is this different to most competitive games and tournaments?

***Activity:*** Make your own ice rink!

Make your own ice rink! Get out some of your favourite small figures and create them an ice rink of their own, for some short-lived but magical playtime!

**Step One:** Take a round cake pan and fill it with a thin layer of water – about half a centimetre. Add a few drops of blue food colouring if you want to. Place this on a level place in the freezer and leave it until frozen.

**Step Two:** Turn the ice out of the cake pan onto a hard surface such as a plate or a foil-covered board. Surround it with vegetation from the garden.

**Step Three:** Add a few of your favourite miniature figures. Have fun!

#79 Taupo Supervolcano

Lake Taupo lies in the caldera of an active supervolcano, the site of the world’s most violent eruption of the last 70,000 years. Just 10 km beneath it sits another lake of molten rock 50 km wide and 160 km long. With a growing need for alternative energy sources, plans for tapping this latent reservoir are hotting up. <https://www.nzgeo.com/stories/the-power-of-taupo>

# *Talking points*: Discuss the ideas presented in the story with your family—at home or over video conferen-cing. Find ways to involve as many people as possible, especially those who you know are isolated.

* Have you ever been to a natural hot spring like the one in the top photo? How do you think creeks like this one end up with warm water? Why do you think some creeks might be hot & others cold?
* At the Nga Awa Puroa geothermal power station, the earth is 60 degrees warm, two shovelfuls deep. Drills reach much further - two and a half kilometres deep - to reach much hotter and more pressurised steam. What do you think the word "geothermal" means? Can you figure it out by looking at the two parts of the word, "geo" and "thermal?"
* What might have gone wrong in Iceland, where they had "red-hot magma jetting out of the well-heads"? How do you think you'd try to rectify that mistake? How might you try to avoid it happening again?
* Can you explain in your own words why it has to be a "closed system," where water is re-injected back into the earth after being tapped into and utilised for its heat energy?
* Have you heard of the VEI (Volcanic Explosivity Index) before? If the famous explosions of Tarawera and Vesuvius both registered 5 on the VEI scale, does it surprise you to learn that the eruption that formed the basin that is now Lake Taupo? measured 8? Were you aware that an eruption at Taupo? around 1800 years ago caused the Waikato River to run at "200 times its normal rate" and carve out an entirely new route for itself? What would this be like to witness?

# *Activity*: Make edible pumice! Hokey-pokey is a lot like pumice, for which Taupo is famous. Both are full of air bubbles and pumice starts out as a hot, frothy substance before it quickly cools. Both are light in weight & light in colour. Make some Taupo-inspired “pumice” for a scientific sweet treat! **You will need:**

* White sugar or castor sugar
* Golden syrup
* Baking soda
* A heavy saucepan
* A spatula
* Greaseproof paper
* A flat tray

1. Find a hokey pokey recipe such as this one: [https://www.chelsea.co.nz/browse-recipes/hokey-pokey/](https://www.nzgeo.com/mailster/435375/e5bb74f451058bce1b8c4a3011207bc5/aHR0cHM6Ly93d3cuY2hlbHNlYS5jby5uei9icm93c2UtcmVjaXBlcy9ob2tleS1wb2tleS8) Carefully follow the instructions, taking care not to let your hokey pokey burn.
2. Pour your hokey pokey mixture into a greased or paper-lined tin and leave it to cool.
3. If you have any pumice, make sure to take a look at how similar the two are. Enjoy the hokey pokey!

#80 From Taro to Tourism

One of the world’s smallest nations is transforming its economy from subsistence to sustainability. Will Niue’s brave new plan work? <https://www.nzgeo.com/stories/from-taro-to-tourism/>

# *Talking points*: Discuss the ideas presented in the story with your family—at home or over video conferencing. Find ways to involve as many people as possible, especially those who you know are isolated by the lock-down.

* Looking at the photos, which ones look the most appealing to you? If you were visiting Niue, what would you hope to see and do while you were there?
* What do you think of the decision to protect 40% of Niue’s marine area?  What benefits and drawbacks might this decision bring?  Are you surprised to learn that New Zealand only has one percent of its EEZ (exclusive economic zone) protected?
* Does whale watching sound different to what you’d imagined it to be? Why do you think the writer says that the experience happens in “a rhythm defined by the whales?” Do you think it’s good that they’ve introduced rules to monitor how much whale watching can happen in Niue, and how it happens?
* What do you think of the comment by the Minister for Natural Resources, Dalton Tagelagi, who says that the commitment to increase marine protection is “an investment in our future and a tribute to our ancestors”? What do you think he means?

# *Activity:* Make a Pacific-inspired wreath - Make the most of spring flowers and weave a wreath inspired by the beautiful Sunday outfits of Niuean church-goers!

**You will need:**

* Trimmings from a vine such ivy. Olive trimmings also work.
* Scissors
* Fresh flowers and leaves

**Step One:** Cut a couple of lengths of vine to about 90cm if possible. Ivy is good because it comes with leaves - it is also a pest species and should be removed or controlled!

**Step Two:** Take one vine and make a circle shape about the size of your head; twist the ends of the vine around the circle so that it is secure.

**Step Three:** Repeat by adding the second length of vine to make it more robust.

**Step Four:** Tuck fresh flowers in among the crevices in your wreath. Use up a pest species like jasmine if you can as it’s a good time to remove this from your garden anyway.

#81 Kokako - In search of the grey ghost

The South Island kōkako is widely believed to have died out a half century ago, but some committed bird experts are convinced there are signs a few remain: disturbed moss, glimpses of grey wings and orange wattles, an occasional haunting call. Yet despite decades scouring southern forests, the kōkako has remained elusive—a single feather is the closest the searchers may have come to proving the bird still exists. <https://www.nzgeo.com/stories/in-search-of-the-grey-ghost/>

# *Talking points*: Discuss the ideas presented in the story with your family—at home or over video conferencing. Find ways to involve as many people as possible, especially those who you know are isolated by the lock-down.

* After reading this article, do you think the ‘grey ghost’ is a good nickname for the South Island kōkako? What are some of the different ways it’s been hard to find?
* DOC classified the bird as extinct in 2008. What are the reasons they might have done this? Do you think it was a good decision? Why or why or not?
* The call of the South Island kōkako is described as like “a cathedral organ,” “an ethereal tolling bell call,” “indescribably mournful” and “sadly suggestive of departed spirits.” Can you imagine the call after reading all these? Do you need to do some research to make sense of these descriptions, such as listening to some pipe organ music?
* 24 year old Geoff Reid is following in Rhys Buckingham’s footsteps to look for the lost kokako and has prioritised this volunteer work over working for money or studying, He says “The universe is my classroom; I’m trying to learn from my elders.” What do you think he might be learning from working with Rhys and being out in the bush? Do you think this is an equally good way of learning, instead of classroom learning? Why or why not?
* Do you know the stories of the South Islandtakahē, which was discovered in the Murchison Mountains, and the NZ storm petrel, which was discovered at the back of Hauturu/Little Barrier? Why do these stories give Rhys Buckingham and others like him hope that the South Island kokako exists?

# *Activity*: Musical Bottles: Have a go at making your own kōkako-inspired music by blowing on bottles!

**You will need:**

* Empty bottles of the same size and shape – glass works best
* Water
* A metal spoon

**Step One:** Take the empty bottles and fill them to differing heights

**Step Two:** Blow carefully across the top of each bottle, experimenting with different ways of blowing until you get a reasonably clear ‘singing’ sound. You might find it works to rest the bottle on your lower lip – you’ll figure it out by playing around.

**Step Three:** Try listening for which ones make higher and lower notes – what do you observe? If you have three bottles, you can try to play a famous tune such as Hot Cross Buns. Playing a duet where one person plays one note and one plays another is also fun. To vary the experiment, try striking the bottles with a spoon – what is different about the notes they make when you play on the bottles this way?

# #82 Hauturu: Resting place of the wind

Mountainous, densely forested and bounded by cliffs and boulders, Little Barrier Island (Hauturu) crouches in the outer reaches of the Hauraki Gulf, a relic of a wild New Zealand now largely vanished. Set aside as a nature reserve over a century ago, the island houses a matchless cargo of wildlife inhabiting an unusual diversity of forest types. <https://www.nzgeo.com/stories/hauturu-resting-place-of-the-wind/> *Talking points*: Discuss the ideas presented in the story with your family—at home or over video conferencing. Find ways to involve as many people as possible, especially those who you know are isolated by the lock-down.

* Hauturu’s 700m peaks are often shrouded in cloud; the forest is “moisture-loving.” What do you see that looks like it thrives in moisture, in the pictures? Looking at the various animals in the pictures, which is particularly special or beautiful to you?
* Captain James Cook gave Hauturu its English name, Little Barrier, in 1769 when he passed by on The Endeavour. What were some of the other things you found interesting about the history of the island? Did you know that it was covered in feral cats for over 100 years, or, when the article was written, kiore?
* In the four years her mother was a DOC ranger on the island, the writer’s teenage daughter filled her days with Correspondence School work, lots of time reading, riding her bike, building huts and climbing trees. With her parents, she fished, swam, snorkelled, played card and board games and listened to music in front of the fire. Is it a life that appeals to you? Would you find it lonely to be the only teenager or child on an isolated island, or not? Did you know that there are still DOC rangers with families living on predator-free islands?
* The article describes the forced removal of Ngati Manuhiri from their homes on Hauturu; “armed Government troops landed on Hauturu and shipped (them) back to Auckland prison in chains.” Shortly afterwards Hauturu was passed into Crown ownership. What is your reaction to this description of the way the government acted?
* The article describes a Ngati Manuhiri whānau coming to Hauturu. A 10 year old mokopuna’s thoughts are recorded as follows:“To Te Kiri, I, one of your mokopuna, followed the wind knowing where it will rest. Tane’s children surrounded me and the songs of birds’ karanga echoed as we came ashore. The eyes of the patu-paiarehe still inhabit the high places. I whisper to the wind the joys, the sorrows of my heart, knowing that they will reach this place.” What does this speech suggest to you about how this boy experiences Hauturu, and what kind of connections he has to the place?

# *Activity*: Make a stalk-necklace - At this time of year, you’ll find hollow, dried stalks in the garden – probably hidden under new spring growth. Agapanthus or similar plants have stalks that dry with a hollow centre, perfect for cutting into beads.

You will need:

* Paint and paintbrushes
* Dried stalks from the garden
* Scissors
* Elastic or string

**Step One:** Find your dried stalks. Make sure you remove any earwigs or other creatures sheltering inside – shake them out into the garden so they can find a new home.

**Step Two:** Paint the stalks in your choice of colours. Varnish over them if you want a gloss.

**Step Three:** When the paint is dry, cut the stalk into pieces. Thread the pieces onto elastic.

#83 Climbing the Darran Mountains

The Darran Mountains lie deep in the marrow of northern Fiordland - a chunky, perplexing range of diorites and sandstones, gneisses and granites. This is a land of extremes, with the country’s most remote summits, the greatest rainfall and the longest, hardest-to-climb alpine rock walls. Adventurers have been coming here since William Grave and Arthur Talbot in the late 1800s, to test themselves and forge new routes through this vertical landscape. <https://www.nzgeo.com/stories/first-ascent-finding-unclimbed-walls-in-the-darrans>

# *Talking points*: Discuss the ideas presented in the story with your family—at home or over video conferencing. Find ways to involve as many people as possible, especially those who you know are isolated by the lock-down.

* The opening paragraph describes the Darran Mountains as “rising sharply,” “castles of stone and ice,” with “sheer rock walls guarding their flanks” and “bordered by the cold dark shadows of the Tasman Sea.” Do these descriptions remind you of any novels you’ve read or movies you’ve seen? If you were writing the score to a film that opened with this landscape, what kind of music would you write?
* The writer uses the name Kā Tiritiri o te Moana instead of the Southern Alps. Do you know anything about where the name Kā Tiritiri o te Moana comes from, or the story of the brothers who were frozen in stone to become the mountain range? You might like to find out about it.
* Adventurer William Grave wrote in the late 1800s of the “irresistible impulse” to venture into “the fastnesses of nature.” Can you put this into modern language? Do you relate to what Grave is saying?
* When completing a particularly difficult climb, the writer describes how he copes. He says: “Rather than being weighted by the increasing airspace below, I focus on what is front of me.” He mentions focussing on the small details in the rock, the way the chalk feels, the clink of carabiners, the careful breathing and focus. He says these things “keep” him in the here and now. If you were using this as a guide for yourself before you went rock climbing, what advice could you take out of it?
* What is your response to the photo of the climbers in their bivouac sleeping bags? What might they see, feel and hear overnight, or first thing in the morning?

# *Activity*: Make some art - Use a phone or a printer to make some interesting cards with photos of rocks or items like flowers.

**You will need:**

* Items from nature—flowers, leaves, rocks.
* A printer or camera phone
* Paper
* Scissors
* Glue

**Step One:** Collect some items that might make interesting images.

**Step Two:** Arrange them on an interesting background—you can even write a note.

**Step Three:** Take photos with the phone to share with whanau and friends. If you have a printer with a scanning function you can scan the items and print them out in colour.

# #84 The weed eaters

Edible plants grow throughout our towns and cities: in verges, margins, berms, parks and empty sections, along driveways, pavements and hedgerows. The trick is knowing what to look for.  
<https://www.nzgeo.com/stories/the-weed-eaters>

# *Talking points*: Discuss the ideas presented in the story with your family—at home or over video conferencing. Find ways to involve as many people as possible, especially those who you know are isolated by the lock-down.

* Looking at the top picture of the man walking by the stream, what words would you use to describe the vegetation? Is it a place you would go to look for food? Do you recognise any of the plants in this picture or any of the others?
* In one picture, an ecologist, Mahuru Wilcox, is shown looking at a plant with her young daughter. They ask “He aha te rākau o te rā?” What’s the tree of the day? This means that they check the lunar calendar and forage from healthy looking trees. What do you think might be signs that a plant is healthy and good to forage from?
* Peter Langlands thinks there is “huge biodiversity in roadsides.” What does this mean? Which animals might appreciate this kind of biodiversity? Is his statement true of roadsides where you live? If not, can you think of any places it would be true of?
* “Having a wild meadow out the front (of your house) is the equivalent of playing loud music at 11pm on a Tuesday night.” What is the writer suggesting about meadows vs lawns? How do you feel about lawns? How do you feel about the idea of more meadows in our cities?
* Do you like the idea of being able to name/identify more plants in your neighbourhood? Would you forage a snack if you were confident to do so? Why or why not? Can you imagine foraging catching on among people your age?

# *Activity*: Go on a foraging scavenger hunt - Go for a walk and see how many edible weeds you can spot! At this time of year you might find violet leaves, wild strawberry leaves and berries, onion weed, dock, daisies, nasturtium, dandelion and several other edible species.

**You will need:**

* A print-out of this scavenger hunt or a phone with this email on it
* Sharp eyes
* An open mind!

**Step One:** Print out this email of have it open on a phone.

**Step Two:** Go on a walk and tick off any of the plants you find.

**Step Three:** Collect any of them that you want to, but get an adult to check them before you eat them!

# #85 Hunting Kiwi

Tussock Tops near Pinnacle, in the West Coast’s Victoria Range. Full moon, the air crisp and still. I’m listening attentively for kiwi, hoping to hear a shrill whistle above the faint murmur of the creek tumbling some distance below. Despite the summer season, it’s cool, and dew collects on the outside of my long johns. <https://www.nzgeo.com/stories/kiwi-hunting/>

# *Talking points*: Discuss the ideas presented in the story with your family—at home or over video conferencing. Find ways to involve as many people as possible, especially those who you know are isolated by the lock-down.

* In the top image, what do you notice about the kiwi’s colouration in relation to its surroundings? Is there anything that surprises you about the kiwi in this photo?
* Did you know that there are five distinct species of kiwi? You might like to find out more about some of them (North Island brown, Great spotted, Little spotted, Rowi and Tokoeka.) Which one is your ‘local’ kiwi species?
* Have you ever been lucky enough to hear a kiwi calling in the wild? Have you heard the male’s shrill whistle and the female’s “harsh, throaty churr”? If you haven’t, you could look these up now and listen to them.
* The writer interviews West Coasters to ask about their encounters with kiwi. One of these, Tim White of Reefton, describes how he used to bivvy, or sleep outdoors, when he went hunting; he didn’t take a pack or tent but slept under rocks and relied on shooting deer for food. He liked to get two deer so he could use one skin for a groundsheet and one for a blanket. What would you like to ask Tim White about his experiences, if you could?
* When he finally hears and sees a kiwi, the writer describes it as “stomping” and “crashing through the undergrowth.” Are these words you would have associated with kiwi or would you have expected them to walk more delicately? Does their clumsy movement give us any clues about the way kiwi operate in their habitat – for example, foraging rather than stealth hunting? What could you say about how it might have affected their ability to hide from predators, both in prehistoric and more recent times?

# *Activity*: Make an ear trumpet - Shaun Barnett had to sit still and listen carefully for around three hours at a time as he searched for kiwi. Sharpen up your listening skills with a home-made ear trumpet! Before hearing aids were invented, ear trumpets were used to help hearing-impaired people. An ear trumpet collects sound from a larger area than what your own ear funnel does. These are channelled into your ear and concentrated in the small space, making what you hear through the trumpet seem louder.

**You will need:**

* A large piece of paper
* Paint, felts or art materials to decorate
* Scissors
* Tape

**Step One:** Draw a semi-circle (half a circle) on a large piece of paper. Cut it out and decorate it with paint or drawings on one side.

**Step Two:** Roll the paper into a cone that’s wide at one end and narrow at the other. Both ends should still have an opening. Secure it into place with tape.

**Step Three:** Hold the ear trumpet at your ear, with the wide end facing outwards. Get someone to talk into the cone. Does it make their voice sound louder? You can also try holding it the other way around to see if it makes their voice quieter. What happens if you speak into the narrow end?

# #86 The war on koi

Invasive koi carp now writhe through wetlands from Auckland to Marlborough, displacing native species and destroying freshwater habitats. For 25 years, bowhunters in Waikato have ministered their own brand of pest control, the World Koi Carp Classic, resulting in prizes, and 70 tonnes of puréed fish. <https://www.nzgeo.com/stories/the-war-on-koi>

# *Talking points*: Discuss the ideas presented in the story with your family—at home or over video conferencing. Find ways to involve as many people as possible, especially those who you know are isolated by the lock-down.

* These emotive words are used in the standfirst (which is underneath the heading): invasive, writhe, displacing, destroying. Which of these words are you familiar with? What is the message you get about koi carp from these words?
* The World Koi Carp Classic has removed 70 tonnes of fish from Waikato waterways. Can you figure out how much this is by working out how many kilograms are in a tonne? If a 40cm kahawai weighs about 1kg, and we presume a kahawai is similar in density to a koi carp, try to estimate how many fish you could fit into your kitchen. How many rooms the size of your kitchen would you need to fit 70 tonnes of fish?
* The story of how koi carp were naturalised in the North Island is interesting – someone released the fish from their garden pond into a stream near Te Awamutu. Do you think that person could have foreseen the consequences of what they did? How does a release of small fish turn into the large-scale problem we have today, where koi are the dominant fish in many waterways? Can you think of any other species that have “naturalised” here?
* The fish are described as a “suffocating presence” in conservation areas. What does the choice of the adjective “suffocating” tell us about their impact on other species?
* The “Carpuccino” invention means that koi can be trapped and turned into fertiliser. They become “nutrient vectors” that can help plants grow on the riverbanks once they’ve been processed. What do you think is meant by “nutrient vectors?” Find out what a vector is if you don’t already know, then try to explain it in your own words.

# *Activity*: Colouring Flowers - Unlike native species which suffer from an oversupply of nutrients in waterways, koi carp can cope with pollutants like nitrogen. Explore the way living things are affected by water by colouring white flowers with food colouring.

**You will need:** Food colouring in one or more colours; White flowers; A vase or jar; Water

**Step One:** Find some white flowers – lilies work well as they have very thick stalks. Cut the stems at a right angle and place them in the jar of water.

**Step Two:** Add food colouring to the water. Watch the lilies at regular intervals to see how long it takes for the coloured water to start showing through in the white of the petals. You might see changes after half an hour, depending on the flowers you’re using.

**Step Three:** After 12 hours, check the flowers again and look at where the petals are most heavily stained. Why might the colour vary in some parts of the petal? How does the colour travel from the water to the petals?

#87 Eliminating predators

# What would happen if city suburbs as well as offshore islands enjoyed freedom from introduced predators? Is it possible for New Zealand to eliminate them all—stoats, ferrets, weasels, possums, and three species of rat? <https://www.nzgeo.com/stories/making-birds> *Talking points*: Discuss the ideas presented in the story with your family—at home or over video conferencing. Find ways to involve as many people as possible, especially those who you know are isolated by the lock-down.

* The introduced predators New Zealand wants to get rid of are stoats, ferrets, weasels, possums and three species of rat. Which of these have you seen/heard evidence of – either at your place or in the wild? Can you name the three species of rat, or tell the difference between a stoat, ferret and weasel? If not, how could you learn to do this?
* The article starts when the author is in a helicopter, heading over the Main Divide to the Perth Valley. Can you find these places on a map?
* What do you think of the trapping inventions ZIP has come up with – such as the egg-mayonnaise dispenser? Did they give you any good ideas for a trap that could be invented?
* Wellingtonians have found that trapping has bought lots of benefits to them as a community. Have you done any trapping? If not, can you find out how to get started in your neighbourhood?
* To increase volunteer numbers in Otago, Bruce Kyle is described as relying on “a human version of the halo effect - people starting to see taonga species in Dunedin city, noticing the increase in birdsong, seeing the forest canopy on the peninsula grow thick and lush, and wanting to be part of the project.” What do you think is meant by the reference to a halo effect?

*Activity*: Conduct a 5-minute bird count - See how birdlife is faring in your backyard, or a location of your choosing in your area.More detailed info [DOC’s website here.](https://www.doc.govt.nz/our-work/five-minute-bird-counts/the-5mbc-method/)

**You will need:**

* A pen and paper and clipboard or book to press on
* A watch or timer
* A bird book if you have one

**Step One:**Prepare your paper by writing down your name, location, date, start time and weather variables: sun, temperature, wind, precipitation, any other noise.

**Step Two:**Sit down quietly in the location of your choice. You will stay in that place for five minutes. Set your timer for 5 minutes.

**Step Three:**Start your timer. For the five minutes until your timer goes off, write down the species and number of any birds you see or hear. Each bird should only be recorded once within that period. Try to record only birds that you see within a 200m distance from your observation point.

#88 Pilot Whales

# They strand on our shores in greater numbers than any other species of whale. Scientists believe they know why, but there is much about these animals that remains an enigma, and the strandings continue to happen. <https://www.nzgeo.com/stories/the-puzzle-of-pilot-whales> *Talking points* : Discuss the ideas presented in the story with your family—at home or over video conferencing. Find ways to involve as many people as possible, especially those who you know are isolated by the lock-down.

* Have a look at the top photo in this article. Why do you think the photographer may have chosen to shoot this image in black and white rather than colour? What mood is created by this choice? How might a choice like this be about telling a story?
* The article talks about how public interest in helping stranded whales has “never been higher.” There are stories about how stranded whales were treated in the 19th and early 20th century, which contrast with the way we try to rescue them these days. Why might people have become more sensitive and compassionate towards stranded whales?
* In the coloured photos of pilot whales and dolphins, are you surprised to read in the caption that these species can congregate in groups of up to 1,000?
* What do you think about the stories of “inter-species altruism?” Can you explain this concept in your own words? Can you think of any other species – plant or animal – that exhibit this behaviour?
* What kinds of things might be causing the increased noise levels in the sea that may be a cause of stress for whales? Could we reduce these noise levels? What kinds of decisions would we need to make as humans? What might be the positives and negatives of making these decisions?

# *Activity*: Nail and string art - If you feel inspired by the article on whales today, you might like to try this retro art activity. Sketch a whale or anything you like, bang in some nails and wind string between the nails to create an outline that you can “colour in” with string.

**You will need:**

* A piece of wood – any size or shape will do
* Some nails – small nails would be ideal
* A hammer
* String or wool
* Paint, if you want to paint the background
* A pencil and a reference picture of what you are sketching

**Step One:** Sketch an outline of your chosen image directly onto the wood. It might be helpful to look at a picture. If you are drawing a whale, you could use one of the pictures in today’s article.

**Step Two:** Hammer in nails around the outline of your sketch. If you’re working at a table, it’s a good idea to put a heavy book or some cardboard under your work to absorb the impact of the hammering (you don’t want to ruin your desk or table.)

**Step Three:** Tie string onto one nail and double-knot it to secure it. Wind the string around the head of an adjacent nail and so on around the nails until you come back to the first nail. This is the outline of your image. Now crisscross randomly from nail to nail inside the outline, making sure you keep tension in the string, until your image is as “coloured in” as much as you want it to be. Tie it off when you have finished and trim the end of the string.

#89 Great Mercury Island

Great Mercury was one of the first sites of human habitation in New Zealand. Last year, a radical new public-private partnership sought to rid the island of pests. It was a unique operation, and the results have been astonishing. <https://www.nzgeo.com/stories/treasure-island>

# *Talking points*: Discuss the ideas presented in the story with your family—at home or over video conferencing. Find ways to involve as many people as possible, especially those who you know are isolated by the lock-down.

* A “public-private partnership” is when a government or council-run group works with a group of citizens or a privately-run business. They both put in money and time to achieve a common goal. What might this be a good model? Can you think of any potential pitfalls?
* The island includes a variety of planting and landscape. There is “plantation forest, farmland, native bush and thick scrub, folded into high peaks and deep valleys and pocked with volcanic caves.” Can you picture each of these? For example, what trees might be in plantation forest? What is the difference between native bush and thick scrub?
* By the time rats had been on Great Mercury Island for about 700 years, DOC described them as being at “plague proportions.” Did you know that rats could cause these kinds of problems: “Rats were jumping into beds with the farm manager’s children, eating through the wiring in the bathroom and wreaking structural damage on farm buildings”?
* Two of the photos show conservation dogs at work on the island. Did you know there are dogs specially trained to help DOC workers? Some help find pest animals, others help find endangered species. What kind of dogs do you think are the best at this work, and what kind of training might they be given?
* The Mercury Island tusked wētā is described as “cryptic and carnivorous.” What do we learn about it from this description? This species is one of the rarest invertebrates in the world – why do you think it isn’t more famous?

# *Activity*: Make a Bug Hotel - Do your own bit of backyard conservation by making a snug, warm home for some local invertebrates. All you need is a bottle, some recycling-bin material and some sticks!

**You will need:**

* An empty milk bottle or drink bottle
* Scissors
* About 40cm of String or rope
* A variety of recycling-bin material – corrugated card, newspaper or paper
* A variety of garden materials – small sticks, hay or dried grass, pine cones, hollow dried stems

**Step One:**Gather your foraged materials. We found sheep’s fleece, pampas grass, hay, a cardboard kitchen towel roll (which we rolled tightly securely) walnut shells, newspaper, twigs and bark.  
**Step Two:**Cut the ends off a bottle. You can leave one end closed or cut off both ends. Cut some slits in the side and poke the string through. Tie it securely. The other end of the string will tie the hotel onto a branch in a warm location.

**Step Three:**Stack materials into the bottle. It should be fairly tightly packed but there will be plenty of nooks and crannies between the materials that insects can happily use. Tie the hotel onto a branch in a warm, not hot location. We tied ours onto a tree branch, about 1.5m from the ground.

After a week, visit your bug hotel and see if it has any visitors.

Try putting one up in a different place – do insects seem to prefer a hotel on the ground, or off the ground? How much shade, light and warmth do they seem to prefer?

#90 Feijoa

Feijoas have become a New Zealand emblem. So how did they end up in Aotearoa, and how did we end up adoring them—to the point of obsession, for some—when feijoas have not really caught on anywhere else? <https://www.nzgeo.com/stories/the-peoples-fruit>

# *Talking points* : Discuss the ideas presented in the story with your family—at home or over video conferencing. Find ways to involve as many people as possible, especially those who you know are isolated by the lock-down.

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* The Mercury Island tusked wētā is described as “cryptic and carnivorous.” What do we learn about it from this description? This species is one of the rarest invertebrates in the world – why do you think it isn’t more famous?

# *Activity:* Make a Wasp trap - It’s a good idea to keep on top of wasp populations so that bees and other pollinators can do their work – helping to make sure we have lots of feijoas and other fruit! This simple home-made wasp trap is easy to put together.

**You will need:** An empty drink container or similar bottle, with funnel neck, Scissors, String, Meat scraps, Water

**Step One:**Cut around the bottle just where the neck starts to taper. Sit the neck facing downwards into the bottle. Tape these together. Puncture the sides of the bottle and tie string through on either side to create a handle.

**Step Two:**Place some meat scraps (we used cat food) in the bottom of the bottle as bait. Add some water so that the wasp will drown when it goes after the bait. (In late summer, wasps switch to looking for sugar, but in spring and early summer they are looking for protein as they build their nests.)

**Step Three:**Hang your trap from a tree or structure a good distance from the places you hang out with your family. Check your trap regularly to see if it is catching anything - it might be worth trying a few different locations if you don’t have any luck. Wasps tend to favour sunny places

#91 Wetlands

Dismissed as worthless, pestilent places, wetlands—where the water table is at or near the Earth’s surface—are anything but. They purify water, prevent floods and erosion, store carbon, provide resources like peat and flax, process nutrients, act as nurseries and offer recreation and aesthetic value. <https://www.nzgeo.com/stories/wetlands>

*Talking points* : Discuss the ideas presented in the story with your family—at home or over video conferencing. Find ways to involve as many people as possible, especially those who you know are isolated by the lock-down.

* Scrolling through the photos in this article, what kind of words come to mind? What atmosphere is created by the photos? What kind of adjectives might describe them – such as shining, creepyormysterious?
* The writer visits a huge wetland – Awarua in Southland. It stretches as far as the eye can see:“13,000 sprawling hectares of bog and fen, tussock and manuka.” It makes him realise that “once, much of our country looked like this.” Did you know that over 90% of our wetlands have been drained? Are there any wetlands near where you live? Do you think your neighbourhood, or part of it, could have been wetland originally?
* The article mentions some different types of wetlands – “bogs, tarns, fens, peat fields, swamps, estuaries and lagoons.” Which ones of these are you familiar with?
* Wetlands “punctuated and perforated our flat lands, soaking up the legendary rains and offering them to plants, insects, amphibians and birds as food and shelter.” Can you put this into your own words – what did wetlands do with the high rainfall in New Zealand?
* “Maori knew wetlands as larders, troves of seasonal sustenance and a store of materials to fashion into mats, ropes, walls, clothes. Healers knew them as dispensaries of medicines, tinctures and supplements. Europeans knew them as a blight. Wetlands had no place in the agrarian ethic they brought here—flat land was coveted; where Maori saw resources, colonists saw pasture, sheep and fences. Prosperity. Progress.” What do you learn from this about the ways Māori valued wetlands? What does the word “blight” tell us about the way they appeared to European settlers? Since European settlement began, to what extent do you think attitudes to wetlands have changed?

# *Activity*: Make your own laundry detergent - Explore the way plants can be used in our daily lives by making laundry detergent from a common introduced species - ivy.

**You will need:**

* Around 80 medium-sized ivy leaves. Older, darker leaves are best but any will do.
* 4 cups of water
* A pot
* Rubber gloves

**Step One:**Gather your 80 or so medium-sized ivy leaves. Ivy is invasive in New Zealand - you should be able to find a plant growing on a fence without too much trouble. Squeeze them to crush them a little (or chop them roughly) and place them in a pot. Cover with 4 cups of water and bring to the boil. Simmer for 15 minutes. Let it cool and leave to soak overnight, or for at least four hours.

**Step Two:**Wearing rubber gloves if you have sensitive skin, squeeze the leaves to extract the saponins (cleaning chemicals.) Strain the liquid through a tea towel or muslin and store in your fridge in a jar or bottle.

**Step Three:**Use in place of laundry detergent - one cup of liquid for one load of washing

#92 Tupaia

One of the most important people in Pacific history, Tupaia was a man of many talents: high priest, artist, diplomat, politician, orator and celestial navigator. After fleeing conflict on his home island of Ra’iātea for Tahiti, he befriended botanist Joseph Banks, and joined the onward voyage of James Cook’s Endeavour. Arriving in New Zealand in 1769, Tupaia discovered he could converse with Māori. He became an interpreter, cultural advisor and bringer of news from islands that Māori had left long ago. 250 years on, we are barely beginning to know who he was. <https://www.nzgeo.com/stories/tupaia/>

# Talking points: Discuss the ideas presented in the story with your family—at home or over video conferencing. Find ways to involve as many people as possible, especially those who you know are isolated by the lock-down.

* From whose point of view are the opening few paragraphs told? How does this influence how we read about the events? Why might the writer have chosen to tell the story this way?
* In the picture of the Tahitians meeting the crew of The Endeavour, how do you think each party is portrayed? Does it seem to be a meeting of equals? Why or why not? In what ways do you think this depiction could be accurate and inaccurate?
* Captain James Cook was instructed to sail to Tahiti to observe the Transit of Venus. Do you know what the Transit of Venus is? Visit this story to find out more about why Cook was sent on this mission: [https://www.nzgeo.com/stories/transit-of-venus/](https://www.nzgeo.com/mailster/437605/f7a85e039e39ba862728ac85d755fc82/aHR0cHM6Ly93d3cubnpnZW8uY29tL3N0b3JpZXMvdHJhbnNpdC1vZi12ZW51cy8)
* What strikes you about Tupaia’s chart of the Pacific Islands, and/or the illustration of the two men trading? Is there anything that intrigues you about Tupaia, that you would like to know more about?
* In Tahiti, Cook opened sealed instructions from the British Admiralty to find any Southern lands and “observe the Nature of the Soil, and the Products thereof; the Beasts and Fowls that inhabit or frequent it, the fishes that are to be found”. What does this reveal about what the British believed they could do with any land they might become aware of? How did that belief come to influence the way they approached colonisation?

# Activity: Grow a Kūmara House Plant - Get a kūmara started in water today and over the next few weeks, you can watch it develop into a stunning house plant! **You will need:**

* A kūmara
* Two tooth picks, or a kebab stick broken in half
* A jar of water

**Step One:**Take a kūmara and insert a toothpick on each side, about 1/3 or just above halfway down.

**Step Two:**Place the kūmara in a jar of clean water and put it on a windowsill or a shelf where you can enjoy watching it sprout roots and leaves. Within about two weeks you will have a budding house plant.

**Step Three:**Keep the water topped up and move it into a bigger jar once it has a full root system. Your kūmara house plant will cascade beautifully by itself, but you can also experiment with training it to climb up or along. It should last around six months if you keep the water topped up.

#93 Manuka Honey – Gold rush

Mānuka honey has exploded in value in recent years, and now it’s a high-stakes business, attracting hive thieves, counterfeit products, unscrupulous players—and triggering a race for the blossom every spring, wherever the trees are in flower. <https://www.nzgeo.com/stories/gold-rush/>

# Talking points: Discuss the ideas presented in the story with your family—at home or over video conferencing. Find ways to involve as many people as possible, especially those who you know are isolated by the lock-down.

* Looking through the photos, a lot of them have golden tones. Do you agree that Lottie Hedley has captured a sense of magic in these photos? What do you think makes the photos beautiful? Do they help us to understand anything about bees?
* Mānuka honey has grown in popularity at such a fast rate that in five years, the hives in New Zealand have doubled, from 400,000 to 800,000. Have you heard people talking about manuka honey or seen it in shops? Do you like the sound of the “astringent twang?”
* Mānuka flowers for a short season and there is a period where the nectar flows particularly fast, so beekeepers “chase” the nectar by taking their hives south as the manuka trees come into season. Did you know that the warmer weather of spring starts at the top of the country and moves toward the South Island over a period of weeks? Why do you think this happens?
* Did you know that there are 28 species of native bees? Do you think you’ve ever seen a native bee? Thinking about urban gardens and parks, what might be suitable habitat for a native bee?
* Young beekeepers working for Mana Kai are chosen for their ability to be gentle around the bees: “bees hate being banged around…they respond to respect and care.” Does this surprise you? What does this show you about bees? Do you like the idea of eating honey from a hive that has been gently handled? Do you think bees might be capable of any kind of feelings towards their keepers?

# Activity: Bee-friendly Garden Hunt - Put on your “bee” eyes and go for a walk in your garden or neighbourhood, to find out how bee-friendly it is! There are three main characteristics of the flowers that bees most want to find. Follow the three steps to see if you can find them all on your walk! **You will just need a** garden or park to look around in

**Step One:**Did you know that bees can’t see red? It looks the same as the surrounding green leaves to them. Instead, they’re attracted by yellow, blue, purple, violet and white flowers. How many can you spot?

You can also check to see whether these flowers are clumped or spread out. From a bee’s point of view, clumps are much more helpful.

**Step Two:** Look for flowers that smell good. Bees follow scents first and notice colours second, so fragrant flowers are important to them. You might find lavender, stock or other fragrant cottage garden flowers. Check native trees such as pittosporum - although their flowers are often tiny and less conspicuous they can smell lovely. Then there are fruit trees! Citrus flowers smell amazing - and you may find plum, pear, feijoa and peach trees in bloom.

**Step Three:**Look for flowers with a simple form. Bees like to get in there and do their job and get out again without too much fuss. Frilly flowers are hard work but simple flowers that give easy access to pollen and nectar are good news for our golden friends. Daisies, forget-me-nots, fruit-tree flowers and pansies are examples of these. Vegetables that have gone to seed are also great -one rocket plant that goes to seed will make hundreds of simple flowers. Lastly - don't overlook weeds! The simple forms of buttercup, dandelion and clover are all appreciated.

You can also use your "bee-eyes" to look for water in the garden - is there a shallow dish of water that a bee could drink from? Are there undisturbed patches of ground that native bees could live in? What could you plant to make your garden or neighbourhood even more bee-friendly?

#94 Dune Lakes – Eyes in the land

New Zealand is a global hotspot for dune lakes, and nowhere has more of these freshwater gems than Northland. It’s here, in our country’s northernmost reaches, that iwi are reconnecting with these taonga and the stories that surround them. <https://www.nzgeo.com/stories/eyes-in-the-land/>

# *Talking points:* Discuss the ideas presented in the story with your family—at home or over video conferencing. Find ways to involve as many people as possible, especially those who you know are isolated by the lock-down.

* In this article we learn about kuta, the lake and wetland sedge that is used for fine, soft weaving; it was “traditionally woven into soft mats, cloaks and rain capes.” Have you heard of kuta before? Are you surprised to learn that raincoats are not just a modern invention?
* “For Hooper, lake restoration can never be just ecological; it must be cultural, too. “It’s not just about the lake. We’re rebuilding our people at the same time. Right now, I’m training some of our young people in how to build fences and do riparian planting. It’s all te ao Māori.”” Looking at the pictures of people, can you explain what looks like “growing” or “learning” or “rebuilding?”
* One of the pictures is of a juvenile common bully hovering above some sunglasses in a “charophyte meadow” on the bed of one of the Kai Iwi lakes. The word “meadow” is not a word most of us would associate with a lake. How does it change your understanding of the lake ecosystem? What changes might have occurred since 2016, when powerboats were banned?
* On “Get to Know Your Dune Lake” days, educator Joanne Murray takes rangatahi to harvest kuta and make rain capes and give them away as gifts; waiata with links between lakes and local marae have been written, and people learn hands-on about the insects and other species in the lake. Do you think these activities are likely to make people feel more connected to the dune lakes? What knock-on effects might come from any feelings of connection?
* “Ngāti Kuri has existed for close to a thousand years…Petera says the iwi has decided it must have a thousand-year vision.” How would our decisions about what we do with and on land look different if we had a thousand-year vision like Ngāti Kuri? Do you feel inspired, or cynical, or confronted by the idea of a thousand-year vision for nature?

# Activity: Make a Weaving Loom: Kuta has been woven for capes, soft mats & cloaks. Weaving is a soothing and tactile activity that you will have a great time exploring!  Make your own weaving loom and weave with wool or any other weaving material to create a unique piece of art.

**You will need:**

* A sturdy piece of cardboard of any size, such as from the end of a pad of paper or cut from a box.
* Scissors
* A ruler
* A pencil
* Ice-block stick
* Wool or anything you would like to weave with – ribbons, fabric strips, harakeke etc

**Step One:**Cut out a piece of cardboard in a rectangle. About 100mm x120mm is a manageable size. Using a ruler, mark in notches at 1cm intervals along the short sides. Use scissors to cut a slit, about 5mm, into these notches.

**Step Two:**Knot the end of a length of wool and wedge the knot in behind the first slit at one end of the cardboard. Pass the wool down to the corresponding slit on the opposite end and bring the wool up the back of the cardboard to come into the second slit. Repeat this until you have a ‘warp’ across the loom. Tie a knot behind the last slit to secure it.

**Step Three:** Wrap an ice-block stick with wool. Leaving a 100mm tail, pass the ice-block stick under and over the warp threads until you get to the end then wrap it around the last warp to come over and under in the other direction. Keep weaving in this way. Push the weave closer together once in a while. You can cut the wool and tie on a new colour as you want to.

**Step Four:**When you are about 20mm from the end of the loom, turn it over and cut through the warp halfway. Remove the warp threads from the slits. Tie them in pairs to ensure the weaving doesn’t come undone. If you want to, you can tie one end to a twig to make a cute piece of hanging art

#95 Auckland’s Unswimmable beaches

Five mm of rain in a day is not uncommon in Auckland, but it is enough to cause parts of the city’s waste-water network to overflow, spilling raw sewage into the sea & making beaches unsafe for swimming. This summer, permanent warning signs were posted at 10 locations where water quality is so bad that Auckland Council no longer monitors it. Why are Auckland’s beaches so frequently unswimmable? Is the solution better plumbing or more enlightened thinking? <https://www.nzgeo.com/stories/no-swimming/>

# Talking points: Discuss the ideas presented in the story with your family—at home or over Zoom. Find ways to involve as many people as possible, especially those who you know are isolated by the lock-down.

* Do you know the difference between freshwater, wastewater and stormwater – all of which are connected to where you live?
* “Today the creek is a torrent, the waterfall is brown thunder—a Huka Falls of sediment-filled water.” Have you ever seen a creek rise suddenly in heavy rain? What did you see? Is “brown thunder” a good description?
* Have you seen a sign saying “Dump no waste, flows to sea” on a stormwater drain? Do you think most people know that stormwater drains carry water (and anything else that goes into them) into streams that flow out to sea? What kinds of things do you see in or near stormwater drains?
* Are you surprised to read that Meola Creek in central Auckland has 450 times the recommended limit of *Enterococcus* bacteria? What effect might this bacteria have on plant and wildlife? Do you think humans can tell that a creek is ‘sick’ even though we can’t see bacteria? What makes a creek seem sick or healthy?
* Have you seen any projects or places which show that either citizens or local government are trying to become more water-sensitive? If you could do one thing to awhi or care for a creek or estuary near you, what would you do?

# Activity: Make a Sediment Jar - When water flows in torrents, everything gets mixed up. Once the heavy flow settles, a creek or river becomes clear again, with layers of material. Make this sediment jar to explore what happens!

**You will need:**

* A jar with a lid
* Water
* A range of materials from outside – pebbles, soil, potting mix, rocks, grass, dead leaves

**Step One:** Fill your jar up about ¾ of the way with water. Add your materials.  
**Step Two:**Screw the lid on the jar and give It a good shake.

**Step Three:**Leave the jar on a flat surface such as a windowsill and watch it for a few minutes to see what happens. Check again in about an hour. What do you notice? What has floated to the top and what has settled at the bottom? Are the contents of the jar similar to a stream in any way?

#96 Orange Fronted parakeets – last chance to see

Twice the kākāriki karaka has returned from the dead. Orange-fronted parakeets were declared extinct in 1919 and again in 1965, but each time, the birds were concealed deep in the beech-forested valleys of Nelson and Canterbury. Now, the bird is approaching its third extinction, and this time, rangers have already scoured the valleys for hidden strongholds. This time, there isn’t a secret population waiting in the wings. <https://www.nzgeo.com/stories/last-chance-to-see/>

# Talking points: Discuss the ideas presented in the story with your family—at home or over video conferencing. Find ways to involve as many people as possible, especially those who you know are isolated by the lock-down.

* The second photo shows orange-fronted parakeet habitat – a Canterbury beech forest. How would you describe the beech trees we see in this photo? How does beech forest look different to other types of New Zealand forest you have seen? What would it be like to see parakeets flying around in this forest?
* “The red-crowns used to occupy the forest floor and lower canopy, the yellow-crowns were in the high canopy, while the orange-fronts, we think, were mid-canopy, understorey feeders.
* “For Andrew Legault, science adviser to the recovery programme, it’s a heavy responsibility. This quiet-spoken, pensive Canadian must somehow wrest the kākāriki karaka from the teeth of oblivion—and every now and again, you get an inkling of the weight upon him.” Have you ever thought about how stressful it must be to be responsible for looking after an endangered species?
* In 2014-15, the Hawdon valley parakeet population almost collapsed – only three pairs of birds remained while the rest were eaten by hungry rats and stoats after a “mast year” in the beech forest. If you don’t already know, find out about what a mast year means and why it can be bad news for birds.
* In one of the pictures, sheets of aluminium foil are wrapped around the trunk of beech trees. This is to stop rats and stoats climbing the trees and taking bird’s eggs. (This technique is also used to stop possums climbing trees.) Have you ever seen this in the bush before? What else could be used to deter pests from climbing trees?

# Activity: Make a Collage: Kākāriki karaka (Orange-fronted parakeets) are a beautiful bright green. Use the photo of a parakeet sitting on a branch against a light green background as inspiration to create a green collage from old magazines.

**You will need:**

* Heavier-weight paper (A5 is a good size so it doesn’t take too long to do this activity)
* Old magazines
* Glue
* A pencil
* Paint

**Step One:**Find some old magazines. Look through them and tear out any pages that have some green on them. All shades of green are useful. Grass is good because it looks a bit like feathers. Once you have a few pages, start tearing the green patches into small pieces. Around 1cm square will work well. Try to keep the different greens in piles so they don’t get mixed up.

**Step Two:**Find a picture in the article that you think would work to copy for your picture. Decide whether your paper should be placed in portrait or landscape. Use the pictures in the article to help you draw an outline of a parakeet sitting on a branch, for example. Place glue on the body of the parakeet. Decide on a green that will look good for the parakeet & stick pieces of that green on its body.

**Step Three:**Use a different green to cover the shape of the branch and light greens for the background.

You may like to mix paint with your collage to make filling in the background a bit quicker.

Now have a look through the magazines again and select a small amount of red, orange, yellow, blue (for the beak) and black (for the eye) to finish off the face or use paint for these features (as it is detailed, it is a little frustrating – do your best!) A permanent marker may also be useful to fill in the beak and eye.

#97 The hunting of the snipe

An unlikely crew is given the assignment of catching birds in butterfly nets on a weather-beaten subantarctic island. <https://www.nzgeo.com/stories/the-hunting-of-the-snipe/>

# Talking points: Discuss the ideas presented in the story with your family—at home or over Zoom. Find ways to involve as many people as possible, especially those isolated by the lock-down.

* Did you know there was a family of birds called ‘snipe’ in New Zealand? Looking at the pictures, what birds do they remind you of? What do you find interesting or appealing about them?
* How does sailing over six-metre swells for several days sound to you? What might six metre waves look like from a small vessel? Can you think of anything that’s six metres, to compare the size of these waves to?
* Snipe “beetle around on the ground like a mini-kiwi” and they must be chased through the bush with a butterfly net in order to be caught. Looking at the photo of the man in the tangle of trees, can you imagine what a difficult job “snipe hunting” is?
* Are you surprised by the stress which is caused by a shortage of mealworms, or the ways which this problem is resolved? How might the story of Don Merton and his team’s failure to find enough invertebrates to feed their translocated snipe have weighed heavily on the team’s minds?
* Do you like the photo of the pouwhenua, Hinekete, watching as DOC ranger Ros Cole carries the translocated snipe to their new home? What kinds of thoughts or actions or beliefs do you think pouwhenua might help people to connect with?

# Activity: Make an Upside-Down Planter - If you’re running short on space to plant vegetables, you might find it useful to try a method of planting that uses the air instead of ground space –upside down planters! Tomatoes, cucumbers and many other vegetables will grow happily upside down, so long as you keep their roots from drying out, as you would with any other potted plant.

**You will need:**

* A vegetable seedling such as a tomato
* An empty milk or drink bottle
* Strong scissors
* String

**Step One:**Cut a keyhole-shaped hole in the bottle lid. Cut the flat bottom from the milk bottle.

**Step Two:**Carefully place the seedling into the mouth of the bottle, roots first. Put the bottle lid onto the bottle, taking care not to damage the seedling’s fragile stem as you do so.

**Step Three:**Cut slits in two sides of the bottle and thread string through these to form a handle. Knot them securely. Carefully fill the bottle with potting mix. Give your new hanging plant a good water and hang it somewhere sunny. Remember to water it daily!

#98 Wool – thick & thin

New Zealand’s economy was built on ‘the back of a sheep’, but in recent decades, the fortunes of wool have been largely eclipsed by the dairy industry. The twin strands of the fine- and coarse-wool industries have taken diverging paths, focusing on the economic challenge of adding value in New Zealand, rather than exporting the raw material. Will wool rebound? <https://www.nzgeo.com/stories/thick-and-thin/>

# *Talking points:* Discuss the ideas presented in the story with your family—at home or over video conferencing. Find ways to involve as many people as possible, especially those who you know are isolated by the lock-down.

* Are you lucky enough to own any merino clothing? Did you know that “merino” is a type of sheep and that merino clothes come from sheep’s wool? What makes merino sheep’s wool more expensive than other types of sheep’s wool?
* After reading about the origins of merino sheep, can you say in your own words how the merino breed originally came from Africa but ended up in New Zealand?
* In South Island high country, “expanses of native grasses provided an ideal beachhead for sheep to get established.” With the benefit of hindsight, today we might think twice before allowing animals to graze on native grasses. What might have been some of the consequences of mass grazing on tussock grasslands?
* The article says that wool is marketed as a premium product in most countries but undervalued in New Zealand because for so long, we were so surrounded by wool (and sheep) that we thought little of it. Do you think we are starting to value wool again? Do you think our attitude to it will change?
* What ideas do you have for new ways we could use wool, given that it is warm and light, doesn’t hold odours, is relatively waterproof and totally compostable?

# *Activity: Have a Foot Bath* - Enjoy some luxury by spending a few minutes with your feet in an Epsom Salts foot bath. You’ll feel fantastic! This is a lovely thing to do for a hard-working person in your family, too! Epsom salts sooth aching, tired feet and reduce swelling.

**You will need:**

* Epsom salts (you can buy a bag of these at the supermarket or pharmacy for about $3)
* Warm water
* A bucket or tub you can put your feet in
* Something fragrant – mint, lemon, rosemary or essential oil will all work

**Step One:**Pour ¼ cup Epsom salts into the basin, then add several litres of warm water. Swish the Epsom salts around with your hand to dissolve them. Add something that will release a relaxing fragrance into the water. You might like to try lavender flowers, a sprig of rosemary or mint, chopped lemon rinds or 8-10 drops of an essential oil.

**Step Two:** Put your feet in the tub and relax! Put on some relaxing music or sit outside in the shade where you can listen to the birds if you want to. You can also place a rug or towel over your knees while you soak your feet to give you an added feeling of comfort, even if it’s a warm day.

**Step Three:** If you’re giving someone else a foot bath, maybe you could offer to give them a hand massage or scalp massage while they have their foot bath, for maximum relaxation

#99 Morgan Gorge Controversy – a tale of 2 currents

Morgan Gorge, a spectacular chasm on the South Island’s West Coast, is a showpiece of whitewater power. Although it has been paddled by fewer than a dozen people, it is the aspiration of kayakers here and around the world to tackle its supreme challenge. If the Minister of Conservation grants a concession to electricity company Westpower to build a hydro-generation scheme on the Waitaha River—as she says she intends to do—Morgan Gorge will become an emaciated trickle for much of the year. Opponents say this would be an environmental tragedy and a cultural loss, tantamount to building a windfarm on the summit of Aoraki/Mt Cook. <https://www.nzgeo.com/stories/a-tale-of-two-currents/>

# *Talking points:* Discuss the ideas presented in the story with your family—at home or over video conferencing. Find ways to involve as many people as possible, especially those who you know are isolated by the lock-down.

* Looking through the photos, does this look like the kind of place you would like to go? What kind of risks would you have to be prepared for?  What would you most look forward to? What would you be apprehensive about?
* Looking at the standfirst (the words under the title) check your understanding of vocabulary. What is a chasm? What is meant by an ‘emaciated trickle?’ What does it mean to be ‘tantamount to’ something?
* If the hydropower scheme went ahead, the river would be reduced to 10% of its flow – a “remnant trickle” that would “provide life support for aquatic creatures.” Does 10% sound like it would be adequate to you? What do you know about the habitat preferences of the blue duck/whio? Would this species cope with a 90% reduction in water?
* Only one percent of the world’s rivers remain in their natural state. What might be advantages to New Zealand protecting the rivers that are not yet altered by technology? Would the personality of a river change after it was impacted by a hydro-dam? Do you think we have any kind of moral obligation to allow natural places to retain the form and personality they had before humanity began to interact with them?
* The writer says that for kayakers, removing the flow of the Morgan Gorge would be like “ripping the last chapter out of a thriller.” What do you think he means by this comparison?

# *Activity: Nature Journaling -* It’s great fun to go outside with a pencil and paper to do some careful observation and sketching. If you have some watercolour paints, coloured pencils or crayons you can take these too and add some colour.

**You will need:**

* Paper (either loose paper, or a journal-sized blank book)
* A pencil
* An eraser
* Something to press on while you’re outside
* Coloured pencils, crayons or a palette of watercolours and a brush (optional)

**Step One:**Collect your materials and head outside. Find a plant or animal to look closely at and draw. It could be anything –even a clump of daisies or some grasses in the pavement would be perfect.

If you choose something big like a bush or tree, it works well to choose one small part, such as one sprig of leaves or one flower, to draw.

**Step Two:**Make a drawing that is as detailed as you can make it. Add some colour and a title if you want to.

**Step Three:**Add any notes that you can. Are the leaves serrated or smooth? Hairy or shiny? If it’s a plant, are there any insects on it? If it’s an animal you’re drawing, what is it doing?

You might like to add a border or find out the Latin name for what you were drawing.

#100 Maui’s Dolphin – Deep trouble

The world’s smallest, rarest dolphin lives in New Zealand. After the expansion of gill-netting in 1970, the population and range of Hector’s dolphin diminished rapidly. One extremely isolated subspecies, Māui dolphin, now numbers barely 100 individuals. Yet science has revealed that the species may yet recover, even from the brink of oblivion. <https://www.nzgeo.com/stories/mauis-dolphin-deep-trouble/>

# *Talking points*: Discuss the ideas presented in the story with your family—at home or over video conferencing. Find ways to involve as many people as possible, especially those who you know are isolated by the lock-down.

* Before reading the article, did you know where Hector’s and Maui’s dolphins live? Had you heard of Hector’s and Maui’s dolphin or know that they are among the world’s smallest, rarest dolphins? What other dolphin species do you know of?
* Looking at the photos, what do you notice about how the dolphins look different to other species of dolphin you may have seen, or seen photos of, such as common dolphins?
* How would you describe the effect of seeing the four dolphins caught in nets? Did you know that dolphins are caught in nets around the New Zealand coastline? How do you think this ends up happening?
* The article says that human New Zealanders share more genetic material with dolphin than any other endemic species. Can you explain why this might be?
* “In a world without nets inside the known range of Hector’s dolphins, the entire population, every group nationwide, would recover to around 15,000 individuals—half of the population size before gill-netting became widespread. And it would take just 39 years.” Banning gill-netting seems like a good idea - what might slow down legislative changes to ban it?

# *Activity*: Home-made Jigsaw: Have you ever tried making your own jigsaw puzzle? You could make one for a friend and drop it into their letterbox for a surprise. **You will need:**

* A magazine picture
* Medium-weight cardboard
* Scissors or craft knife
* Glue
* Pencil
* Eraser

**Step One:**Find a picture you like and carefully cut around it. Glue it onto cardboard. Make sure you put glue over the entire back of the picture as when you cut out your jigsaw, you want it to stay stuck down on every piece.

**Step Two:**Turn the cardboard over and draw on puzzle pieces with a pencil. The bigger you make the pieces, the better it will turn out.

**Step Three:**Cut carefully around your pencil markings, using scissors or a craft knife. Put all the pieces into a ziplock bag and give the puzzle to someone else to do

#101 Mayflies – between 2 worlds

Hatched in rivers, mayflies rise to the surface and unfurl new wings, the final phase of their precarious and astonishing lifecycle. <https://www.nzgeo.com/stories/between-two-worlds/>

# *Talking points:* Discuss the ideas presented in the story with your family—at home or over video conferencing. Find ways to involve as many people as possible, especially those who you know are isolated by the lock-down.

* Mayflies look similar to dragonflies and damselflies. (One of the differences between them is the mayfly’s mass-hatching.) What are your experiences seeing dragonflies, damselflies and mayflies? Can you tell them apart?
* Mayflies are described as “the link between algae and fish.” Could you draw a diagram that shows how algae, fish and mayflies are connected?
* Mayflies (and their relatives, the dragonflies and damselflies) offer “a reasonably accurate representation of the health of a particular waterway.” What do you think this means? In the stream or waterway nearest to where you live, are there any mayflies, dragonflies or damselflies, and what does that tell you about the health of that waterway?
* A fossil imprint of Bojophlebia prokopi, the world’s largest mayfly, was found in the Carpathian Mountains and dates back about 300 million years. Its wingspan was 450mm. Measure this out to see how big it was. What might it have been like to see? Do you think those large wings made any noise? Which creatures do you think might have preyed on them?
* When they hatch, mayflies “struggle through the viscous membrane” of the water’s surface. What do the words “viscous” and “membrane” mean? What are the “two worlds” that are separated by the viscous membrane of the water’s surface?

# *Activity*: Surface Tension Experiment - Hatching mayflies must struggle to fly upwards from the water’s surface. Explore the concept of surface tension with this simple paperclip experiment.

**You will need:**

* A magazine picture
* Medium-weight cardboard
* Scissors or craft knife
* Glue
* Pencil
* Eraser

**Step One:**Your first challenge is to get one paperclip floating on the water. This is not easy – if you just put a paperclip into the water you’ll find it sinks straightaway. A good technique to get your paperclip floating is to lower it in, balanced on another paperclip which “cradles” the second. To make your cradle paperclip, bend one arm upwards and use this as a handle.

**Step Two:**Once the paperclip is floating, gently remove the “cradle” paperclip. What is keeping your paperclip afloat? (The water molecules are tightly bunched together forming a dense surface that can support the weight of the paperclip.)

**Step Three:** Dip the toothpick into dishwashing liquid. Allow a drop of dishwashing liquid to fall onto the water. (It doesn’t need to be near the paperclip for this to work.) What happens? Does the paperclip instantly sink? Why does it do this? (As a surfactant, the dishwashing liquid pulls apart the water molecules so the surface tension is interrupted and stops supporting the paperclip.)

#102 Black Stilt – a delicate balance

Deep in the Mackenzie Basin, the world’s rarest wading bird roams free in the wild, unaware that behind the scenes, a handful of people are trying to solve a problem: how to protect a species that refuses to be contained? <https://www.nzgeo.com/stories/a-delicate-balance/>

# *Talking points:* Discuss the ideas presented in the story with your family—at home or over video conferencing. Find ways to involve as many people as possible, especially those who you know are isolated by the lock-down.

* Looking through these beautiful photos of kakī, which ones do you find interesting, appealing, funny or sad? Which would be the best photo to use if you were trying to promote kakī conservation to the public?
* Kakī live in braided rivers. Have you ever seen a braided river? How could you describe one to someone who hadn’t? If you haven’t, you could search for images to see what these special rivers look like.
* Kakī are now only found in the Mackenzie Basin. One reason they were killed by predators in every other location is because they freeze when they sense danger. Do you know of any other birds that do this? (The brown teal or Pāteke is one.)
* DOC ranger Cody Thyne reckons kakī are special because they’re a Canterbury icon – like locals they have been through a lot. Do you like the idea of a region “adopting” a native species as their special icon or mascot? What would be a good native species to represent the place you live in?
* You might like to learn more about wading birds - how do wading birds use their long beaks to feed? What kinds of food are kakī probably looking for? What other wading birds do you know of?

# *Activity: Make a bent-legged Kakī -* Use split pins to make a kakī with super bendy legs.

**You will need:**

* Split pins
* Paper
* A pencil and eraser
* Colouring in pencils or crayons

**Step One:**Choose one of the photos from the article and use it as inspiration to draw an outline of a kakī. Make the legs a little longer above and below the knee. (The legs must also be big enough at the knees to secure a split pin through them.)

**Step Two:**Cut out your drawing. Cut the legs in two at the knees. Colour in your picture as you would like it to be. (It might be a juvenile or a fully-black adult.)

**Step Three:**Cut a slit through the top of the lower legs and the bottom of the upper legs. Insert a slit pin first through the top leg and then through the bottom leg on each side. Move the legs into a position you are happy with. Mount your kaki onto backing paper if you want to.

# # 103 Mining on Conservation Land

A proposal by Australian-based Bathurst Resources to strip-mine a swathe of conservation land inland of Westport, on the West Coast of the South Island, has once again sparked a clash of cultural priorities. Should the ecological and landscape values of the plateau—a dramatic combination of rock, wetland, subalpine forest and tussock—be jeopardised for the economic benefits of extracting the coal that lies beneath? And should a country that trades on its green image be in the business of mining the planet’s most environmentally unfriendly fuel? <https://www.nzgeo.com/stories/the-black-and-the-green/>

# *Talking points :* Discuss the ideas presented in the story with your family—at home or over video conferencing. Find ways to involve as many people as possible, especially those who you know are isolated by the lock-down.

* Looking through the photos, which ones do you find beautiful or interesting? How many of the creatures can you name without reading the captions?
* Are you surprised to see a snail hatching out of a hard shell? Did you know that a snail could live up to 20 years, like the powelliphanta species pictured? Do you think many young New Zealanders know that we have a carnivorous snail and if not, would they find it interesting to find out about? (Powelliphanta slurp up worms from the forest floor.)
* The opening paragraph of this article is amazing – the author is “up to his knees in a forest” that despite its short stature may be hundreds of years old. What kind of conditions would produce such a low-growing forest?
* The writer quotes from late local poet Leicester Kyle, who described the landscape as an “untrod field of singing flowers.” What do you learn about the land from this description? What does the word ”untrod” mean and why might the flowers seem to sing?
* “Names should have some zing to them” – the flatworm is an unexciting name, considering that it is an insanely frightening predator. The writer and photographer consider whether the “Sandstone Anaconda” or the “Copperhead Hell Worm” would be better names for the flatworm they are looking at. How might those names change the public’s attitude towards a species

# *Activity: Finger Knitting -* This calm and satisfying form of knitting can be done with only your fingers and a strand of wool! It’s a great way to keep your hands busy while you have to sit still.

**You will need:**

* Wool – either real wool or acrylic yarn
* Your fingers

**Step One:** Tie a slipknot in the wool and slip the loop of the knot over the “pointer” finger on one hand.

**Step Two:** Wind the wool around your pointer in a second loop. Pull the first loop over the top of the second loop and off your finger. Now you should have one loop (the second one) on your finger.

**Step Three:** Repeat the process – making a second loop and dragging/pulling the first one over it and off your finger – until you have a chain of knitting that is a length you are happy with. Tie a knot in the end when you have finished. You can use this knitting to make a belt, a necklace or a thread to hang photos or art from

# # 104 Run for your life

In the 1960s, New Zealander Arthur Lydiard introduced the concept of jogging to the world and sparked a global revolution towards fitness and well-being. Running became the most popular participation sport on the planet, but also the cause of numerous preventable injuries. Now, new scientific evidence and an emerging movement of ‘natural running’ serve to reinforce Lydiard’s original vision of the sport—the ultimate regimen for “a healthy, vigorous life”. <https://www.nzgeo.com/stories/run-for-your-life/>

# *Talking points:* Discuss the ideas presented in the story with your family—at home or over video conferencing. Find ways to involve as many people as possible, especially those who you know are isolated by the lock-down.

* Did you know that running / jogging has not always been a recreational activity? Did you know that a New Zealander, Arthur Lydiard, came up with the idea and made it popular? When / why might people have run prior to the 1960s when jogging “started?”
* Have you heard of “the runner’s high”? The writer describes enjoying “the sensations of running—the cooling breeze against the skin, the views, the whiffs of sun-dried wild thyme, the mesmeric rhythm of my footfalls.” Can you relate to this or imagine why people might enjoy running, or does it all sound crazy to you?
* If you don’t already know some of these names from the “golden era of New Zealand running” – see if you can find out about Murray Halberg, Peter Snell and Barry Magee.
* Arthur Lydiard started jogging clubs which were popular with unfit middle-aged people. From reading about these clubs, what do you think made them such a success?
* Reading about the way running shoes have both changed the way we run and caused an epidemic of injuries, do you feel inspired to try barefoot running?

# *Activity: “Running Kid” flip book* - A flip book creates the illusion of a moving image when you “flip” through the pages. Have a go at this simple “movie” on paper!

**You will need:**

* A wad of post-it notes, or a stack of small papers stapled together at one side
* A pen or pencil

**Step One:**Starting at the bottom of the wad of papers (on the last paper) draw a stick person in a crouched position, as if they are at the starting line of a running race. Draw close to the bottom of the page.

**Step Two:** Continuing to draw along the bottom of each page, continue to draw a stick person on each page, showing the person standing up then moving along the page to the right, as if they are running off the page. By the time you get to about the 8th page they should have “run off” the page and you can just draw some “speed signs” to show the air rushing by where they’ve run.

**Step Three:** Find someone to show your “movie” to. Ask them to train their eyes on the bottom of the page as you flip so that their eyes are tricked into seeing movement. It should look as though you are watching a simple cartoon of a person running.

#105 Great White Butterfly – The Phantom Menace

In a land where invaders are cinematically popularised as battle-clad Orcs thundering down a mountainside wielding spiked clubs, it’s ironic that Public Enemy No. 1 is a butterfly—an ephemeral being borne on alabaster wings, not dissimilar to an already well-established cousin. And yet, this phantom menace threatens to wipe out a large number of native plants and more than 230,000 hectares of commercial crops. <https://www.nzgeo.com/stories/the-phantom-menace/>

# *Talking points:* Discuss the ideas presented in the story with your family—at home or over video conferencing. Find ways to involve as many people as possible, especially those who you know are isolated by the lock-down.

* Have you seen a white “cabbage” butterfly before? Have you seen the damage they do to brassicas? (Find out which vegetables are in the brassica family, if you don’t already know!) Can you imagine a larger version of the white “cabbage” butterfly?
* One of the photos shows a cluster of “great white” eggs. Another shows a group of their caterpillars feeding on a leaf together. How do these photos represent the much greater destructive impact of the great white butterfly, compared to its small white relative?
* The writer describes an “inch-long” caterpillar. How many centimetres are in an inch? Find a ruler and see if you can measure it. Which countries measure in inches? What other measurements belong to the imperial measuring system?
* DOC rebranded the “large white” (as it is known in other countries) to the “great white,” in the hope that an association with the great white shark would help the public understand what a threat it poses. Do you feel like that was a smart move? How might it motivate the public?
* After this article was published, the great white was in fact successfully eradicated. The Nelson public played a huge part in this, working with DOC to find caterpillars and butterflies. In one school holiday, DOC offered $10 for each captured butterfly and this was a great success - over 130 were sent in by children! How would it feel to be part of an eradication mission like this? What invasive species could you help to eradicate – such as moth plant?

# *Activity: Make a sundial* - Have a go at making a sundial! Ancient people used these tools as one of the first methods of recording time. One way to introduce this activity is to talk about the sun as an artist, sketching the message of time on the Earth as it spins.

**You will need:**

* A piece of paper
* Some rocks for weights
* A pencil
* A flat piece of grass

**Step One:**Lie your paper down on a flat grassy surface. Pierce the middle of it with your pencil. Weight down the edges of the paper so it doesn’t blow away or swivel on its axis.

**Step Two:**On the hour, note where the shadow is falling and draw a line along this shadow. Write down what the hour is. Make sure you draw along the length of the shadow as you will notice an interesting change in the shadows’ length as the hours draw towards midday, and after midday.

**Step Three:**Continue marking the shadow’s position and length on the hour, for several hours. What have you learnt? What might have been a limitation of sundials? What other ancient time-measuring devices could you explore? You might like to try making a water-clock or candle-clock.

#106 NZ Falcon - Enraptored

The New Zealand falcon, or karearea, is the country’s only endemic raptor. Able to take prey six times its own weight, it has no enemies but man. Habitat destruction, the gun, and obstacles such as wire fences and power lines have all contributed to its decline. But today the timeless art of the falconer is returning sick and injured birds to a new life in the wild. https://www.nzgeo.com/stories/enraptored/

# *Talking points:* Discuss the ideas presented in the story with your family—at home or over video conferencing. Find ways to involve as many people as possible, especially those who you know are isolated by the lock-down.

* The kārearea can take prey up to six times its own weight. Just for fun, multiply your own weight by six. How many kgs did you get? See if you can think of something that weighs about six times as much as you do and imagine being strong enough to lift that object or animal using just your fingers! (Useful animals to compare could include a donkey, which weighs between about 180 – 220kg, or a kunekune pig, which can weigh up to 200kg.)
* Ruby, the tame falcon in the introduction, is “irresistible;” “both handsome and deadly.” What do you like most in the light-hearted description of her?
* If a female kārearea doesn’t kill her prey upon impact at 200km/hr, she uses her specialised beak to bite the prey’s cervical vertebrae – that’s just below the skull. Does this sound like a reasonably merciful way for the prey to go? Does it sound like prey has much advance warning of a karearea’s approach?
* What do you think of the photo of the fluffy chick in a medieval leather hood? Have you seen pictures of nobles “hawking” in illustrations from the Middle Ages? Does the idea of having a tame falcon appeal to you at all - can you see yourself as a potential “raptorphile?”
* Towards the end of the article, there’s a suggestion that tame raptors could help us with problems such as pest control. Having read about this, do you think it’s an idea with potential? What might be obstacles to the adoption of the idea

# *Activity: Make your own lollies* - Ever get frustrated with your adults’ restrictive attitude to lolly-buying? Get resourceful with this straight-forward homemade lolly recipe and you can make your own!

**You will need:**

* 100g sugar
* 1 lemon
* A saucepan
* A teaspoon
* Greaseproof paper

**Step One:** Stir lemon juice and sugar together.

**Step Two:** Put the mixture in a saucepan and bring to the boil, then stir while it thickens into a syrup or darkens slightly in colour. Watch carefully as it won’t take long - and it won’t taste good if it burns. Remove from the heat.

**Step Three:** Drop the mixture one teaspoonful at a time onto the baking paper. When the drops have hardened they are ready to eat!

#107 Fossil Whales - Valley of the whales

The North Otago limestone country holds one of the world’s most important fossil cetacean records, a coherent story of how whales and dolphins evolved in the Southern Ocean. It’s a story that one small rural community has embraced as its own. <https://www.nzgeo.com/stories/valley-of-the-whales/>

# *Talking points:* Discuss the ideas presented in the story with your family—at home or over video conferencing. Find ways to involve as many people as possible, especially those who you know are isolated by the lock-down.

* Looking through the illustrations of prehistoric sea creatures, how does each one look familiar, and how does it look different? What do you think of the squalodontid – the shark-toothed dolphin, pictured here seizing a giant penguin in its teeth?
* Ewan Fordyce is New Zealand’s only cetacean palaeobiologist. What can you figure out about what he does for a living, based on your knowledge of these words? Guess what you can first, then look up anything you’re not sure of. (For an extra challenge – how quickly can you say ‘cetacean palaeobiologist?’)
* North Otago’s limestone country has been marketed as the “Vanished World Trail” and allows visitors to access prehistoric fossil sites on private farmland – so you can go and see things like the skeleton of a giant penguin where it was deposited on the ocean floor millions of years ago. It was also a location for The Chronicles of Narnia. Is this a place you’d be excited to go and visit? What can you find out about where the trail is, how you’d get there and what you’d try to see?
* “This valley is a time capsule, filled with the memories of creatures from another era.” Can you explain how the limestone hills of North Otago came to be filled with layers of the bones of sea creatures?
* Scientists examine the fossils for clues as to the creature’s identity – such as tiny protrusions on the ear bone. Why might it be considered important to keep trying to figure out what creatures lived in the past, and how they are linked to living creatures today?

# *Activity: Make a Solar Cookie Oven:* You don’t need electricity to make a batch of biscuits – a box and a few bits and pieces from the pantry are all you need, provided it’s a sunny day!

**You will need:**

* A pizza box or some other kind of relatively flat box
* Black paper
* Tinfoil
* Kebab sticks
* Some tape
* Scissors
* Plastic kitchen wrap

**Step One:**Cut a large flap in the lid of the pizza box, leaving the hinged edge along the back of the lid. Cover the inside of the flap and the inside of the base of the box with tinfoil.

**Step Two:**  
Put a piece of black paper on the bottom of the box and put your uncooked cookies on it.

**Step Three:**Prop the flap up at an angle that allows the sun to reflect the tinfoil on the top down onto the cookies. Use the kebab sticks to prop it up. Cover the cookies with plastic kitchen wrap (tape this into place so it doesn’t blow away.) After about two hours your cookies will be ready to eat – they might not be as crisp as if they’d been cooked in a conventional oven but they should be delicious!

**Lone Activities**

# Create a bean tepee

Get inspired toward self-sufficiency by the rugged Chatham Islanders! Make a structure on which you can grow beans (or sunflowers). Get it all prepared now and once garden centres are open for business, you will be ready to plant! If you plant in spring, by summertime you should have a nice leafy structure to hide away in.

You will need:

* About 10 tall sticks or stakes (1.5m or taller is ideal)
* String or wool
* Scissors
* A spade

**Step One:** Plan out a horseshoe shape on a reasonably flat, sunny section of the lawn or garden. The horseshoe should be large enough for a child to sit comfortably inside. Place the tall sticks at intervals of around 15cm around the horseshoe, bringing them together at the top and tying them with string.

**Step Two:** Once you are happy with the shape of your tepee, embed each stick more firmly into the ground and dig a small patch of soil around each one, so that there is loosened soil ready for when you can do your planting later on.

**Step Three:** Take the string and begin to lace it around the sticks from the bottom, right around the horseshoe and in a zig-zag shape upward to the top. This will provide the support your bean plants will need to attach to as they grow

# Make a jet boat

Have some fun watching this simple jet-propelled boat make its way across your bath or paddling pool.

**You will need:**

* A kitchen sponge
* Scissors
* A balloon
* A small piece of garden hose or similar tubing
* A rubber band

**Step One:** Cut a prow shape at one end of the sponge. Cut a vertical slit close to the end of the sponge. Insert the garden hose into the slit, angling it back so that its end is toward the stern of the ‘boat.’ Carefully cover the deck-side end of the hose with the neck of the balloon and blow the balloon up. Twist it a few times to stop the air escaping.

**Step Two:** Take one of the offcuts of sponge and cover the hull-side of the hose with it. Secure with a rubber band (a small one would be best.) This regulates the airflow and makes your boat’s ‘engine’ last a lot longer.

**Step Three:** Place the boat in the water. It should ‘jet’ forward as the air pushes out of the balloon, through the tube and into the water, thrusting the boat forward. It helps if the balloon is flopping forward over the prow. If the balloon flops back, it changes the angle of the hose and makes your boat drive in reverse.

# Make a twig raft

Embrace your inner-adventurer with this enduring boat-building exercise - the twig raft. Use strips of harakeke instead of string to bind the twigs and give your boat a Kiwi edge!

**You will need:**

* 6-8 similar-sized twigs
* 2 shorter twigs
* 1 longer, thinner stick
* A harakeke leaf (harvest according to protocols)
* A large leaf for a sail
* Scissors or a pocketknife

**Step One:** Working from the thin end of the harakeke leaf, split off a piece of string. Tie this around one of the longer sticks. Lay the long sticks in a row and working in an under, over pattern, weave the string across the other long sticks and come back through until the string has run out; then lash it or tie it in securely. Repeat this at the other end of the raft.

**Step Two:** Turn the raft upside down and use diagonal lashing to secure the shorter sticks going crossways at either end of the raft.

**Step Three:** Insert the longer, thinner stick into the middle of the raft and use diagonal lashing to secure it. This is your mast. Pierce the large leaf onto the mast and take your raft for a spin.

1. **Ten Pin Bowling**

Try this fun lockdown version of ten pin bowling using some old milk bottles and any paint that you have lying around home.

* First, paint your milk bottles. Paint the tops separately so they don't get stuck on. Use any colour you have—these penguins don't have to be black and white. House paint will give adhere well to plastic—we used interior house paint from an old test pot.
* Cut flippers out of paper. We used an outdated New Zealand atlas—you could use any paper. Glue these paper flippers on and if possible, varnish over them with a clear glue or varnish. We used mod podge.
* Paint a face and feet onto your penguins.
* Fill each bottle with a small amount of water (about 200ml works) and line them up in the hallway.
* Find a ball or hacky sack and take turns to try to knock the penguins over. Knocking a penguin over flat earns you 10 points—with five throws allocated to each player, how many points can you get?  Adapt the rules as you want to. Adding more water makes it harder to knock them over; less water makes it easier.

1. **Activity: Make a go-kart**

Get your own fix of tinkering with speed by making a go-kart! Use any materials you can find or scavenge from neighbours and relatives to make a mean machine of your own. Don’t have any decent wood? You can use anything - fence pales, bamboo, a drawer from an old chest.  If you can’t find any broken bikes or buggies to take the wheels from, try upgrading a couple of scooters or an old office chair.

**You will need:**

(The following materials are a guide – you can adapt to fit your own materials or ideas)

* Plywood for a seating board – either 1x18mm-thick or 2x9mm-thick sheets of plywood (you can also use wood of a similar thickness to plywood; old shelves would do.) These will need to be at least 300mm wide x 500mm long to allow you room to sit on them comfortably.
* A long piece of 4”x2” (90mmx45mm) wood for the centre beam
* Two short pieces of wood for the front and rear axles (about 400mm long works well)
* A slim piece of wood around 300mm long for the brake
* Five small blocks of wood for attaching the wheels and brake
* Four wheels (either all the same size, or two small and two large)
* Length of thin rope for steering – around 1200mm should be plenty
* Bolts, nuts and washers
* Screws
* Wood glue (optional)
* An electric drill

**Step One:**Screw (or glue) your two sheets of ply (or other) wood together to make a double-thickness seating area (single thickness is ok if it is strong enough to hold your weight without bending.) Place one end of the centre-beam on the underneath of the seating board, allowing for at least 300m sticking out the front. Screw into place.

**Step Two:**Attach the front axle, steering and wheels. Drill a hole in the middle of the front end of the centre-beam and a hole in the middle of the front axle board and bolt these together. The front axle board should still be able to swivel from side to side, allowing you to steer. Drill holes in the front axle board, on either side of the centre-beam, and tie the ends of rope underneath at each side to make a steering handle.

Screw one of the small blocks of wood under each end of the front axle. Bolt a wheel onto the outside of each of these. Your wheels may already have bolts in them; in this case, drill holes to fit the size of the bolts. If not, first find bolts that fit the wheels, then drill holes that will fit the bolts.

**Step Three:** To bolt on a wheel, put the bolt through the hole and tap it with a hammer if you need to. Where the bolt sticks through the other side, place the washer and nut and tighten the nut so that the wheel can spin freely but doesn’t wobble.

If any two of your wheels are smaller than the other two, use these on your front axle.

Screw blocks onto rear axle and bolt on wheels to blocks, using larger or same sized wheels. Screw the rear axle board into place under the centre-beam. (If your seating board is strong enough you can just screw your rear wheel blocks directly into the seating board.)

**Step Four:**Finally, take the slim piece of wood around 300mm long and screw this onto the side of one of the small blocks. Attach it to the underneath of the seating board just in front of one of the back wheels. Make sure the brake can lever back and forth freely.

Add anything else you want to – we added old car seats and made it a two-seater. Take it for a spin! Helmets and long pants and shoes are always a good idea to make sure you don’t get hurt if you crash.

This video on the Mitre 10 website takes you through the basics of go-kart construction: [https://www.facebook.com/mitre10/videos/420751779407719/](https://www.nzgeo.com/mailster/437748/e5bb74f451058bce1b8c4a3011207bc5/aHR0cHM6Ly93d3cuZmFjZWJvb2suY29tL21pdHJlMTAvdmlkZW9zLzQyMDc1MTc3OTQwNzcxOS8)

1. **Three Legged Race**

On your marks, get set, go! Try one of the events that kids love at Castlepoint – a three-legged race! Even if you only have one other person to run with you can hone your skills and have a great time.

**You will need:**

* A strip of old t-shirt or something stretchy like it
* Two people
* Some flat ground – grass is best (in case you fall over)
* A start and finish line

**Step One:**Stand beside the other person in your pair. Tie your inside legs together with your stretchy fabric strip. Put your arms around each other’s shoulders or waists.  
**Step Two:**Try walking, then running together. You need to move your inside legs at the same time. Keep practicing until you have a good rhythm.

**Step Three:**If you have four or more people, you can race another pair of three-legged runners.

You could also have a go at an egg and spoon race. Each person gets a golf ball or similar-sized ball (the ‘egg’) and a spoon. Hold it out while you race each other to the finish line, trying to keep the ball on your spoon.

# Excavate Your Own Clay

Rather than go to the shops for clay, why not check out what’s in your garden? You can shape something simple like a sitting bird or make a simple pinch-pot.

**Step One:**Dig a hole – you’ll probably have to make it about 30cm square so that you can go deep enough to find clay. At around 35cm deep, (depending on where you live) you might start seeing some grey or reddish-brown. Clay has a shiny, gummed-together look compared to the more granulated topsoil which is above it. If you are digging near a stream, it might be closer to the surface.

**Step Two:**Take a small handful of clay and wet it thoroughly. Work it with your hands, kneading it between your thumb and forefinger to get any tiny lumps out and make it pliable. (This is messy – have some water and a towel handy.) Roll the clay into a ball then press your thumb in the middle of it to make an indentation.

**Step Three:**Pinch around the edges of the indentation, drawing the sides to form a bowl shape. You have just made a clay bowl with clay from your garden! You can also start with a ball shape then draw out a head, beak and tail to make a simple sitting bird or duck.

# Ice-cream in a bag

Getting ice-creams at the theatre is always fun. Make your own with this simple method. You can make a dairy-free version by using orange juice instead of cream, to end up with sorbet.

**You will need: (for one serving)**

* A small ziplock bag
* A larger plastic bag, either with a ziplock or big enough that you can hold the top in your fist
* ¼ cup of cream
* 1 tsp sugar
* ½ tsp vanilla essence
* Ice
* Salt

**Step One:**Pour ¼ cup of cream into the small ziplock bag and add the sugar and vanilla essence. (Pour the orange juice in if you are making the dairy-free version.) Close the bag securely.

Fill the larger plastic bag with about 5cm of ice and sprinkle salt liberally onto the ice. Place the small bag of cream with the ice in the big bag.

**Step Two:**Shake it for 10 minutes.

**Step Three:**Remove the small bag and see whether the cream has frozen into a soft solid. If it hasn’t, shake for a bit longer. If it has, you are ready to serve up your ice-cream.

1. **Print-making**

**You will need:**

* Foam or similar packing materials
* Paint and paintbrush
* Scissors
* Paper or card to print on
* Scrap paper for practicing
* Newspaper to lay under your work

**Step One:**Look through your cupboards and recycling/rubbish bins for any scraps of foam that might work to make a print with. Try cutting any foam that can be easily cut, to make simple shapes. Other items such as bottle corks or old cotton spools also work well.

**Step Two:**Coat one side of each scrap with paint and press it firmly onto paper to see what shape print it makes. Play around with different scraps until you find some you could use to make a picture with.

**Step Three:**Print repeatedly with your scrap blocks, re-applying paint as you need to, to create a picture. You could try printing a picture of a stone wall in a field, like this one.

# Activity: Make stuffed grapevine leaves

At this time of year, grapevines are sending forth massive amounts of new growth. Their edible and nutritious leaves can be harvested to make a Greek dish called dolmades.

**You will need:**

* Grape leaves (about 30)
* ½ cup rice
* A chopped onion
* ½ cup olive oil
* 1 cup warm water
* 1 lemon
* A frying pan or large pot
* A dinner plate

**Step One:**Gather some leaves from a grapevine. At this time of year there will be baby bunches of grapes. Pick any of the leaves that are growing beyond the bunch.

**Step Two:** Rinse and blanch the leaves (cook briefly in boiling water.) Saute the onion in olive oil. Add the rice and saute for one minute. Pour in the warm water and a squeeze of lemon juice. Once the rice has absorbed the water you can add some salt and pepper if you want to. Set aside to cool.

**Step Three:** Place a teaspoonful of the rice and onion mixture on a blanched grape leaf and fold the bottom ends of the leaf up over the rice. Wrap the sides in over the rice one at a time. Roll from the bottom up until you have neat parcels. Put all your dolmades into a frying pan or large pot and cover them with water and a drizzle of olive oil. Place an upside-down dinner plate on top of the dolmades to hold them in place and bring them to the boil. Let them simmer for 30 minutes then drain and let cool. Drizzle with more olive oil and a squeeze of lemon juice and enjoy as finger food.

**Step Four:** Fold the sides of the grape leaf over, one on top of the other. Roll the dolmade up from the bottom to the top

# Activity: Make a box guitar

It’s amazing what great sounds you can get out of a box and rubber bands! This incredibly basic musical instrument is a lot of fun.

**You will need:**

* A cardboard box – any size or shape will do but you must be able to fit rubber bands around the width of it
* Rubber bands – around four
* A craft knife or scissors

**Step One:**Gather your materials and check the rubber bands fit around the box.  
**Step Two:** Cut a rectangular shape in the top of the box. Using a craft knife works well for this but scissors will also do the trick.

**Step Three:** Stretch your rubber bands over the open rectangle shape. Have a play with the different notes and resonances created by different rubber bands.

If you’re lucky enough to have a range of thick and thin rubber bands, you might find these create different notes.

Are you able to play a tune like Twinkle Twinkle Little Star? Have a go at tightening up the rubber bands to make different notes.

# Activity: Make a batch of scones

A cherished tradition among choppers at the Taihape and District A & P Show is the spread – urns of tea and coffee, scones, sandwiches and sausage rolls. Celebrate this great Kiwi tradition with a batch of scones! This recipe is based on “Best Ever Scones” from www.edmondscooking.co.nz

**You will need:**

* 3 cups flour
* 6tsp baking powder
* ¼ tsp salt
* 1 – ½ cups milk
* 75g butter

**Step One:**Preheat the oven to 220 degrees Celsius. Grease or flour a baking tray. Sift flour, baking powder and salt and rub in the butter with your fingertips until it resembles fine breadcrumbs.

**Step Two:**Add the milk and mix to a soft dough. Turn the dough onto the baking tray and flour the top. Cut it into 12 pieces and separate them so they have room to grow.

**Step Three:**Bake for 10 minutes or until golden brown. Cut them in half, butter them and enjoy!

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**Step Two:**Add the milk and mix to a soft dough. Turn the dough onto the baking tray and flour the top. Cut it into 12 pieces and separate them so they have room to grow.

**Step Three:**Bake for 10 minutes or until golden brown. Cut them in half, butter them and enjoy!

# Activity: Folded Paper Streamer

Have you ever made a paper streamer decoration? These are fun to fold and magical when you unfold them! Crepe paper in two contrasting colours makes great streamers for a party decoration but you can use any paper to make a small streamer.  
**You will need:**

* Scissors
* Tape or glue
* Crepe paper in two contrasting colours. If you are using crepe paper, cut a strip about 4cm wide in each colour and leave it in a roll or wad. (If you don’t have crepe paper, use normal paper.
* Giftwrap or an old painting could work well but you would need to join up the strips with glue to make a long, narrow, continuous piece of paper.) Try to use a softer, floppier weight of paper.

**Step One:** Glue or tape together the ends of your two strips of paper, making them into an ‘L’ shape.  
  
**Step Two:**Fold back over the centre, alternating colours. Press firmly down to make a crease each time you fold. Do this until you think the paper streamer might be long enough.  
  
**Step Three:** This Is the fun part – unfold your work. If you’re happy with the length, secure the end with glue or tape. Now you have a decoration you can use around the house!

# Activity: Make a Pomander

This craft has been around for centuries – apparently Henry VIII’s adviser Cardinal Wolsey carried one around to freshen the air when he had to mix with commoners. Making a pomander is a warming and memorable sensory experience. Pomanders create a beautiful fragrance so they’re used as room scents. They would also make a nice waste-free Christmas present!

**You will need:**

* A kebab stick or toothpick
* An orange (or other citrus fruit – an apple would also do)
* Half a packet of cloves (whole cloves, not ground cloves.)

**Step One:** Use the kebab stick or toothpick to prick a line of holes going from the top of the orange to the bottom. Place a tea towel underneath the fruit as you work to catch any juice.

**Step Two:** Insert a clove into each hole. Repeat until you have lines of cloves running all the way around your orange.

**Step Three:** If you want to, you can completely cover the orange with cloves. If you’re happy with how many you’ve got, you can tie a bow around it so that it can be hung up. Your pomander is ready to be used as a room freshener or decoration

# Activity: Make a magazine-strip collage

Use strips of magazine photos to create an eclectic and playful collage.

**You will need:**

* Magazine images
* Scissors
* Glue
* Backing paper

**Step One:**Select some images that contrast to one another – for example a person, a car and a landscape. Cut each image lengthways into narrow strips.  
**Step Two:** Play around with arranging the strips next to one another, such as a strip of person next to a strip of car. Vary the heights so they create a jagged top and bottom.

**Step Three:**When you are happy with your arrangement, glue the pieces down onto a sheet of backing paper. Paint on a clear gloss if you have one and add a border if you want to

# Activity: Invisible Ink

Write a message to someone using invisible ink!

**You will need:**

* Lemon juice
* Paper
* A toaster

**Step One:** Squeeze some lemon juice out of half a lemon.

**Step Two:** Dip a kebab stick or similar slim item (the end of a thin paintbrush would work) into the lemon juice and write a message on the paper. Wait for the writing to dry; it should become almost invisible.

**Step Three:** Give the message to somebody. To read it, they will need to expose the paper to heat (without letting it burn, of course!) A good way to do this is to put the toaster on. Heatwaves will rise and burn the carbon in the dried lemon juice, making your secret message visible!

# Activity: Box dolls-house

Find a box and see what you can do to make an amazing dolls-house that is all your own creation.

**You will need:**

* A box
* Ice-block sticks – large and small are useful
* Glue
* Small boxes, tinfoil

**Step One:**Decide how you would like to divide up your dolls-house. To make a wall, cut ice-block sticks to the same length and glue them together. You can also layer small boxes on top of each other and beside each other to make ‘stories.’

**Step Two:**Make floor coverings. You can make ‘tiles’ by cutting up small ice-block sticks to different lengths and gluing them down end to end. Or glue a piece of card, paper or felt onto the ground for carpet.

**Step Three:**Make furniture, such as a bookcase, from a small box divided up with ice-block sticks and hung on or against the wall.

Hi Folks,

Just wanted to thank the team involved in the production of Together at Home. You did an amazing job producing a resource for every school day of our lockdowns. I have kept a copy of the sciencey ones (all 107 of them!) and it’s an amazing resource. The imagination and creativity to produce so many activities! It speaks volumes about your skill and your generosity. You did what you could to help and it is appreciated.

Mike

<https://www.nzgeo.com/stories/may-11-australia-video/> which video does this talking points refer to please? Cannot find it in your search functions.