

YEARS 5-8

Tuatara and the Sun

Ko Tuatara me te Rā



OVERVIEW

Investigate why the Sun is so important for tuatara and learn about the differences between ectotherms ('cold-blooded' animals) and endotherms ('warm-blooded' animals).

NZ CURRICULUM LINKS

LEARNING AREAS:

ACHIEVEMENT OBJECTIVES:

LEVELS:

YEARS:

Science: Communicating in science

Build language and develop understanding of the many ways the natural world can be represented.

3-4

5-8

English

Listening, Reading and Viweing

3-4

5-8

TEACHER INFORMATION:

Learning sequence



INTRODUCING
KNOWLEDGE



EXPLORE AND
INVESTIGATE



CREATE AND
SHARE



REFLECT AND
EXTEND



MAKE A
DIFFERENCE

Learning intentions

Students are learning to:

- identify why the Sun is important for tuatara
- recognise differences between cold-blooded animals (ectotherms) and warm-blooded animals (endotherms)

Success criteria

Students can:

- describe why the Sun is important for tuatara
- sort statements which describe endotherms and ectotherms

Resources needed

Slideshow: [Tuatara and the Sun](#)

Additional Support

Tuatara are endemic, endangered New Zealand reptiles. Reptiles have a backbone (spine), scales, and lay eggs. Although tuatara belong to the reptile group, they are not lizards. The closest relatives of tuatara were a group of extinct reptiles called Rhynchocephalia. They have some unique ancient features such as two rows of teeth in the top of the skull, a spiny egg-tooth and a third eye.

Vocabulary

Tuatara, endotherm/ cold-blooded animal, warm-blooded/ endothermic animal, hibernate, reptile, survive, sun, heat.

Any text highlighted in **orange** represents a link to further material. If you have printed this resource, please return to schoolgen.co.nz/for-teachers/resources to access the linked material.

LEARNING EXPERIENCE

Note: These are suggestions only and teachers are encouraged to adjust the activity to suit the needs and interests of their students.



INTRODUCING KNOWLEDGE

Allow approximately 20 minutes

Introducing the tuatara and cold-blooded animals (ectotherms)

- View the [Tuatara and the Sun](#) slideshow
- Also view the Genesis School-gen video: [Tuatara encounter](#): (4 minutes long). The video is also part of the slideshow above.
- After viewing, discuss what a tuatara is, why the Sun is important for tuatara and what an ectotherm/ cold-blooded animal is.

Tuatara

Scientific name:
Sphenodon Punctatus

Population:
Less than 100,000

Endemic to New Zealand
(only lives in New Zealand)

Locations found:
In the wild tuatara live only on New Zealand's offshore islands, where they are no introduced predators.







Image by Polly May
http://www.genesis.govt.nz



What are tuatara?

Tuatara are native endangered New Zealand reptiles. **Reptiles** have a backbone (spine), scales, and lay eggs. The name tuatara means 'peaks on the back' or 'spiny back' in te reo Māori.



The closest relatives of tuatara were a group of extinct dinosaurs. They are unlike any other living creature and have some unique ancient features.

Cold-blooded animals (ectotherms)

Cold-blooded animals (ectotherms) such as reptiles, fish, frogs, snakes and tuatara, change temperature with their environment. They use the Sun's energy to warm up. When it is cold they are less active and eat less.



These animals don't sweat or shiver, they just change position to get to the right temperature. On a hot day they might hide in a burrow or find some shade.

Warm-blooded animals (endotherms)

Warm-blooded animals (endotherms) need to eat food regularly to stay at a comfortable temperature. They use the energy in the food to make heat. Because warm-blooded animals need so much food they spend a lot of time hunting and eating. Ectotherms include humans, birds, whales, cats and dogs.

Cooling down and warming up
On a hot day, many warm-blooded animals will sweat and pant to cool down. Some will lose their winter fur or feathers in the summer. Warm-blooded animals have fur or feathers and extra fat to help them keep warm.



EXPLORE AND INVESTIGATE

Timing will vary

THINKING LIKE A SCIENTIST:
Observing cold-blooded
animals/ectotherms

If possible, students could visit tuatara or other cold-blooded animals (such as reptiles or amphibians) to observe their behaviour in and out of the sun. Notice the weather and the Sun's position during your visit and see if this has any effect on the behaviour of the ectotherms. You can find tuatara on many offshore islands, such as Tiritiri Matangi island (north Auckland) and Matiu Somes Island (Wellington). They are also kept at some zoos and wildlife parks, including Auckland Zoo, Hamilton Zoo, Zealandia (Wellington) and Kiwi Birdlife Park (Queenstown).

Alternatively, a staff member or student may have a reptile as a pet which could be borrowed for observation.



CREATE AND SHARE

Allow approximately 20 minutes

Shadow puppet templates

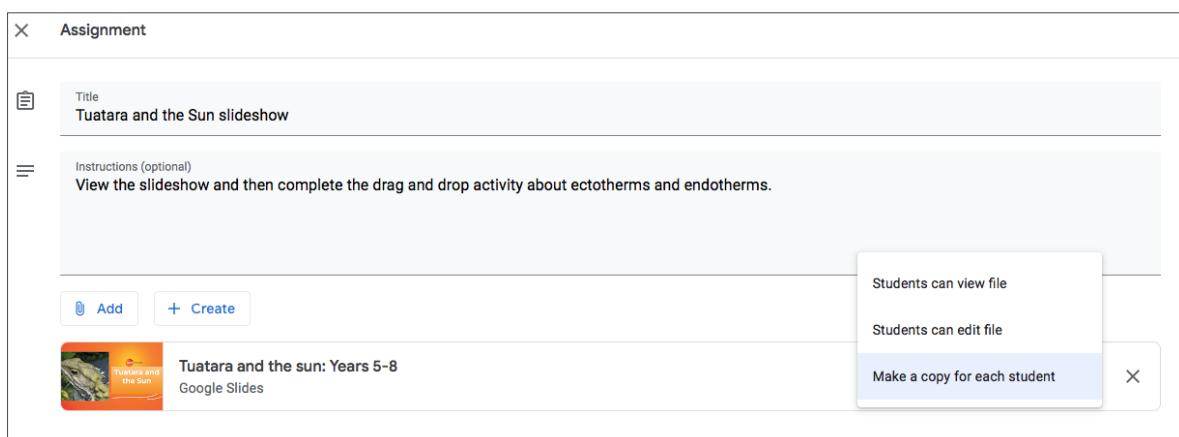
Students can create puppets or recycled art of tuatara and other ectotherms and endotherms. These puppets were made using paper towel rolls, cardboard, felts, feathers, googly eyes and coloured paper.



REFLECT AND EXTEND

Allow approximately 10 minutes

Students can try the sorting animals and cold and warm blooded animals on page 6 of this activity, or from the [Tuatara and the Sun slideshow](#) (slides 14 and 15). Remember to share the slideshow as an assignment in the classwork tab of your Google Classroom, selecting 'make a copy for each student' in the drop down menu (as pictured below) giving each student their own copy so that the drag and drop will work for individuals.



Drag and drop: Cold and warm blooded animals

Cut out the descriptions in the text boxes on the right and stick them into the right columns.

Cold-blooded animals (ectotherms)	Warm-blooded animals (endotherms)

Get their energy from their environment e.g. the Sun

Get their energy from food

Move into the sunlight to keep themselves warm

Can sweat or shiver to change temperature

Have to eat regularly

Cannot sweat or shiver

Are not able to survive in very hot or cold temperatures

Can keep a constant temperature

Further information and supporting resources

- [Science Learning Hub](#)
- Zoo tales video: [Truly unique tuatara](#)

TEACHER ANSWERS:

Cold-blooded animals (ectotherms)	Warm-blooded animals (endotherms)
Crocodile Tuatara Snake	Dog Horse Human

Cold-blooded animals (ectotherms)	Warm-blooded animals (endotherms)
<ul style="list-style-type: none"> • Get their energy from their environment; e.g. the Sun • Move into the sunlight to keep themselves warm • Cannot sweat or shiver • Are not able to survive in very hot or cold temperatures. 	<ul style="list-style-type: none"> • Get their energy from food • Can sweat or shiver to change temperature • Have to eat regularly • Can keep a constant temperature.



MAKE A DIFFERENCE

Allow approximately 15-30 minutes

- Tell Discuss the threats for tuatara, e.g. climate change, introduced predators such as rats and stoats and habitat loss. What can we do about these threats? Commit to an action that will make a difference for one of these threats. For example, start trapping rats, planting trees or walk, bike or scooter for short journeys.
- If you're visiting offshore islands where tuatara live, be sure you don't take pests with you by checking your bags for pests thoroughly before you leave the mainland. Stay off islands where there is a no-landing rule.
- Support a restoration project where tuatara live or a wildlife park or zoo which helps with captive breeding.
- Do you think it would be possible to one day have tuatara back in mainland New Zealand? How could we help this to happen? Try some persuasive writing to unpack your argument.



We hope you have enjoyed this educational STEM resource.

School-gen is a Genesis community initiative to get kaiako, tamariki and whānau enthused about STEM.

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