

WHY FROGS COUNT



Empowering students to be citizen scientists

Australia has 240 known species of frog, almost all of which are found nowhere else in the world.

Some species are flourishing, like the Striped Marsh Frog. But others have declined dramatically since the 1980s, and four have become extinct.

Croaks, whistles, bleats and barks – every frog species makes a different sound. By recording a frog call with the **FrogID** app, students will discover which frogs live around them and help us count Australia's frogs, empowering your students to be citizen scientist.

FrogID is a national citizen science project that is helping us learn more about what is happening to Australia's frogs. All around the country, people are recording frog calls with nothing more than a smartphone.

With the data obtained through **FrogID** we are able to track the Cane Toad and identify where frogs are thriving and where they aren't. And by matching calls to weather and habitat, we are learning more about how different frog species are responding to a changing environment.



Get your class and students involved in FrogID:

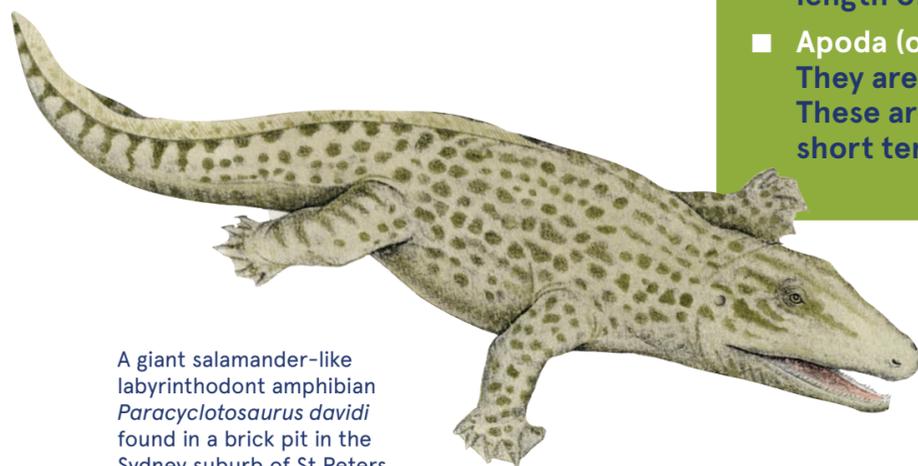
1. Create account & group at FrogID.net.au
2. Instruct Students to create account & join class
3. Download the FrogID App, Sign In & Record
4. Check Leaderboard for Results.

 **FrogIDAus**
 **@FrogIDAus**
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#FrogIDAus

Amphibians

The ancestors of frogs and other amphibians were fish that had fleshy fins and sometimes breathed air. They evolved about 350 million years ago.

Having legs and breathing air allowed early amphibians to live on land but they had to return to water to breed.



A giant salamander-like labyrinthodont amphibian *Paracyclotosaurus davidi* found in a brick pit in the Sydney suburb of St Peters.

There are now three groups of amphibians remaining in the world:

- Anurans (or tailless) frogs and toads. There are over 7000 species of anuran.
- Urodelans (or tailed) salamanders and newts. They were probably the first vertebrates to spend any length of time on land.
- Apoda (or legless) caecilians. They are rarely seen. These are worm-like with short tentacles on their head.



Red-eyed Tree Frog *Litoria chloris*, Barrington Tops NSW

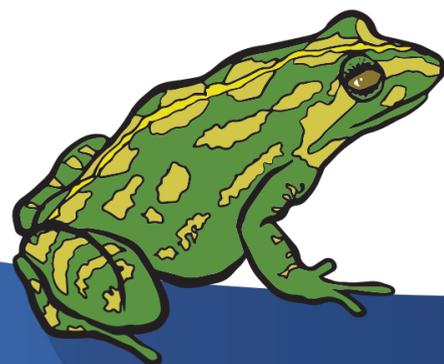
What are frogs?

Frogs are amphibians.

Amphibians have two parts to their life cycle: most species have their egg and larva stage in the water and then spend most of their time on land as adults.

Did you know?

Frogs are the only amphibians native to Australia.



Frogs are amphibians and most:

- have a backbone and internal skeleton (vertebrates)
- have four limbs
- have simple sac-like lungs
- have soft, moist skin that allows water and oxygen to pass in and out of the body
- cannot make their own body heat so depend on the temperature of the environment for their warmth (ectothermic)
- undergo metamorphosis (change) from a swimming tadpole larva into an air-breathing adult
- lay unshelled eggs covered with jelly. The eggs can dry out easily, so they are often laid in water or damp places.

Where do frogs live?

Frogs live on all the large landmasses of the world, except Antarctica and Greenland. They are most common in the warm, wet tropics, but they also live:

- in rainforests
- in dry deserts: when conditions become dry the frogs burrow down into the sand

- in alpine to coastal areas
- in treetops to under the ground, cliff faces to sphagnum moss bogs, still water to running streams

They always require moisture to survive and to breed.



The Crucifix Frog, *Notaden bennettii*, is found in the black soil plains areas and semi-arid grasslands of New South Wales and Queensland. It burrows into soil to wait for the infrequent summer and autumn rains.

Frog types

There are five families of frogs in Australia:

- **Tree Frogs, the *Hylidae*,** can be divided into climbing frogs, ground-living frogs and water-holding frogs.
- **Ground Frogs, the *Myobatrachidae*,** also live in a variety of different habitats.
- **Narrow-mouthed Frogs, the *Microhylidae*,** live on the ground. Some of them have toe discs for climbing and most are walkers rather than leapers.
- **True Frogs, the *Ranidae*,** have long hind legs which allow them to swim and leap well. There is only one species of True Frog in Australia.
- **Toads, the *Bufo* family,** have a different bone structure from other families of frogs. The introduced Cane Toad is the only toad in Australia.



Cane Toad *Rhinella marina*, Tozier Range QLD



Southern Green Stream Frog *Litoria nudidigita*, Kangaroo Valley NSW



Did you know?
Most species have skin that dries out very easily.

Frog Adaptations

Put your best foot forward

Frogs are specially adapted for the places they live in.

Many frogs that live in forests and rainforests have sticky toe discs to help them climb and to keep them in place when they are resting on leaves or branches.

Frogs that burrow to keep from drying out in arid areas have tough tubercles on their back feet to help them dig into the earth.

Frogs that swim have webbed feet to make them more efficient in the water.

Frogs that live in the trees often have webbed feet to help them glide down from the canopy.



The feet of different frog species can reveal a lot about their lives.

Did you know?
Frogs have hands with four fingers and feet with five toes.



Diversity of frog hands.

Frog food

Tadpoles are mostly herbivores grazing on algal slime and other pond matter. Most adult frogs are carnivores, eating mostly moving insects. Some frogs will eat anything small enough to be shoved into their mouths and swallowed whole – even other frogs.

Frogs' tongues are attached to the front of the mouth and can flick out to grasp passing prey. Their tongues are sticky so they can hold their prey better.

Frogs are very important predators of insects, helping control pests that could destroy valuable crops.



Green Tree Frog *Litoria caerulea* eating a grasshopper.

Frog senses

Frogs have good eyes to see their prey and focus by moving the lens rather than it changing shape, like in mammals. Frogs can only detect moving prey. Frogs ear drums are the round patches behind their eyes.

Frog colours

Frogs come in many colours, some of which help to camouflage them. Some frogs can change colour with the movement of pigment granules in their skin cells. These changes in colour are generally in response to stress, temperature change and background colour changes.

Some frogs also have patches of bright colour on the inside of their thighs to startle predators when the frog jumps. These are called 'flash markings'. Frogs may use these bright colours to warn predators that they are unpleasant-tasting or poisonous.



Eastern Stony Creek Frog *Litoria wilcoxii*, Oxley Wild Rivers National Park NSW



New England Tree Frog *Litoria subglandulosa*, Glen Innes NSW

Did you know?
Some frogs can jump up to 15 times the length of their own body.



Life cycle

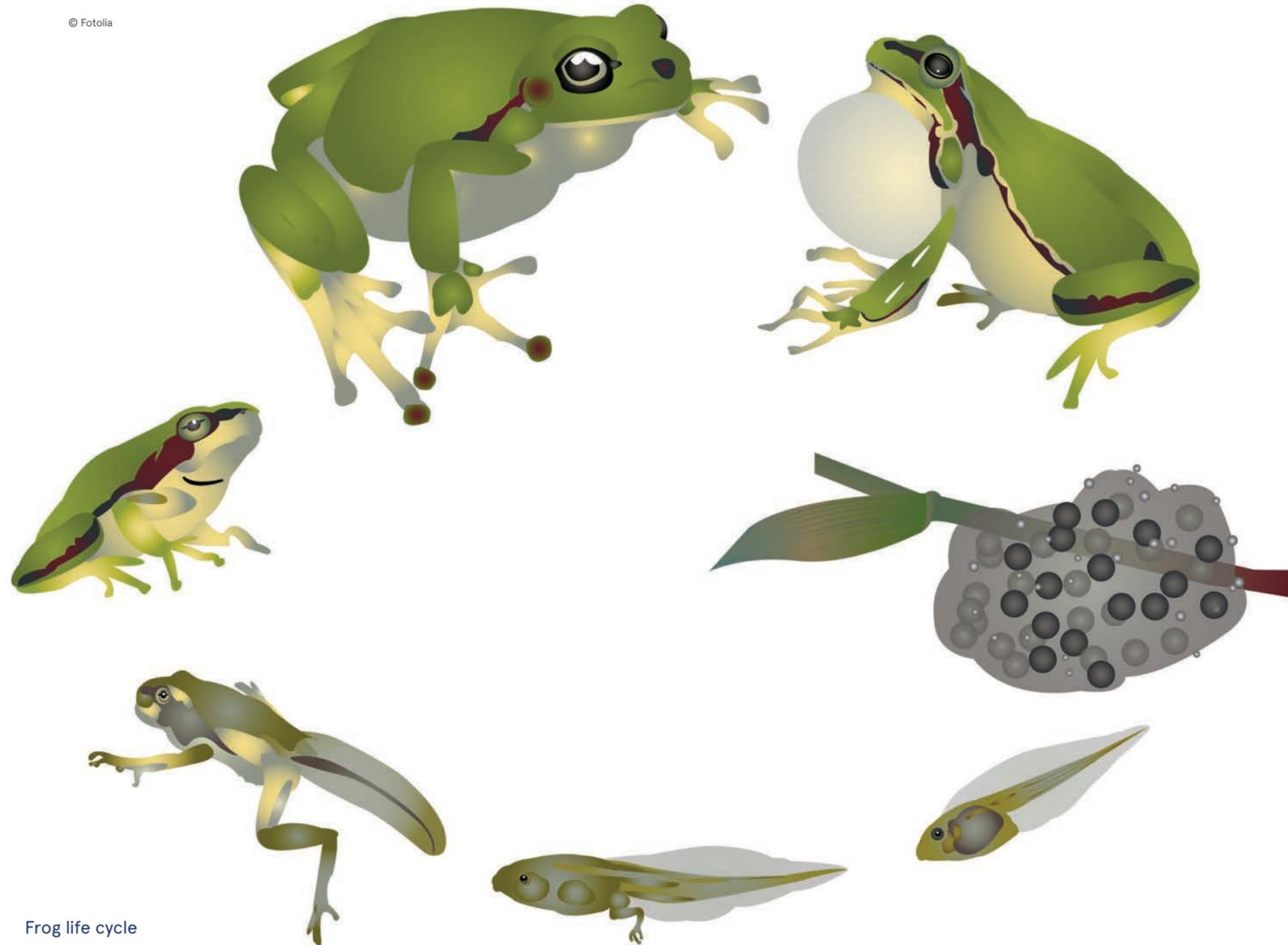
Spotted Marsh Frogs

Spotted Marsh Frogs live in the eastern half of Australia. They can be found in swamps, lagoons and creeks in wet coastal areas and dry inland areas.

- tadpoles get oxygen from the water through their gills
- when Spotted Marsh Frogs breed, males use a mating call to attract females
- the males then make a floating foam or bubble raft in which the eggs are placed
- the female is the one that whips it up into a foam
- when the tadpoles hatch out, they drop into the water.



Spotted Marsh Frog *Limnodynastes tasmaniensis*, Condobolin NSW



Frog sounds

Most frogs can make sounds if they are distressed or under attack. Male frogs also make territorial calls particularly when it is raining.

Only male frogs give the mating call. They make these calls by pumping air over the vocal cords in their throat. Vocal sacs under their throat increase the volume of the sounds from the vocal cords.

Female frogs have ears that are tuned to hear only the call of their own species in a crowd of calling males, so there is no chance of them getting confused during mating.



Calling Graceful Tree Frog. *Litoria gracilentata*, Richmond Range NSW



Calling Broad-palmed Rocket Frog *Litoria latopalmata*, Oxley Wild Rivers National Park, NSW

Endangered frogs

The main threats to frogs are:

- habitat destruction
- pollution
- introduced species
- disease – chytrid fungus
- climate change

Frogs are often the first animals to be affected by man-made pollutants and so act as biological indicators of the state of the environment. Their reactions to the environment provide an early warning of environmental degradation and pollution. This is because the soft skin of frogs, which allows them to absorb water and oxygen very

easily, also allows them to absorb man-made pollutants found in the environment.

Different pollutants affect frogs in different ways, but they often result in decreasing populations of frogs and an increasing number of physical deformities in future generation.



Southern Corroboree Frog *Pseudophryne corroboree*



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