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Reptiles and Amphibians

GREAT STORY & COOL FACTS



Reptiles and Amphibians

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Reptiles and Amphibians

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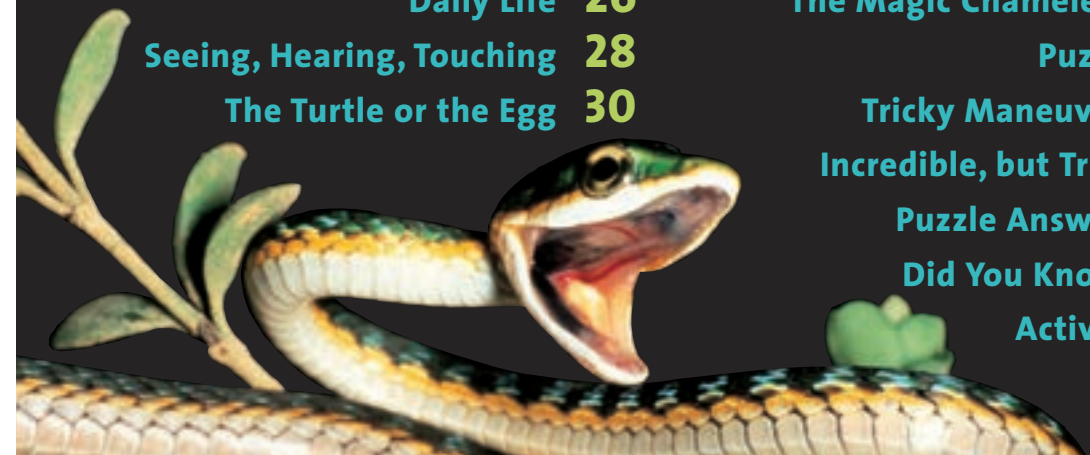
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The Call of the Sea

Story by Christophe Lambert
Illustrated by Gaëtan Dorémus



In the beginning . . .

I open my eyes for the first time and there, far above me, is the black sky studded with stars. I need to move up toward the stars and out to the surf that I hear crashing in the distance. How do I know this? I'm not sure exactly . . . It's as if all the experience of earlier generations of turtles is packed inside my head, like air in a balloon. The balloon pops, and thousands of tiny nuggets of knowledge shower my brain.

I guess this is what is called "instinct."

All around me, other eggs are hatching. Shells crack and split, revealing the tooth-like horn at the tip of each baby's snout. My nest-mates and I climb on top of one another. There are dozens and dozens of us and we all have the same goal: survival.

I am a sea turtle; a hawksbill turtle, to be precise. I have just been born this very moment.

I will never know my mother. She laid her eggs on this beach last spring, and it is now early autumn. She dug a deep hole in the sand in which to lay over 100 eggs, then camouflaged the nest well, using twigs, branches, and sand. This helped to hide the eggs from the badgers, foxes, and weasels that might have eaten all the eggs before they were hatched.





Now that I have safely emerged from my egg, I know that the most important job of my life lies before me. I must make my way out of this nest and into the open sea.

My journey begins with a struggle to climb up out of the hole where I was born. Flipper-legs, designed for swimming, not walking, scabble on the ground and the sand. My nest-mates and I crawl over each other. It is a terrible, terrifying crush and the weakest fall back down into the deep nest to die.

With great difficulty, using my webbed claws, I pull myself up the slope. A sand-slide sends three turtles behind me back to the bottom. How many of us will make it to the sea, I wonder?

The urge to survive is powerful. It gives me the strength to keep fighting my way to the top of the nest.

Across the sand

As I near the top, the smell of the salt sea air is stronger and the sound of the waves is louder. I must reach the ocean. Though I have never seen it, I know it is where I belong. I feel it. Instinct, remember?

With a gigantic effort, I hoist myself out of the hole, and there it is before me: the vast expanse of water that draws me like a magnet. The stars and moon are reflected on its surface. Waves break and vanish on the shore with a gentle lapping motion.

It is beautiful. I can't tear my eyes away from this universe that is so new, yet strangely familiar. It seems to stretch out its arms to welcome me.

Now it is a race to the ocean, a marathon of baby turtles. Our instincts tell us we must take advantage of the cool night air. If we don't hurry, the hot sun of the day will sap our strength and we will fail in our mission to reach the sea.

Unfortunately, our flippers are made to move through water, not through sand. Our progress is slow.

Hungry Sea Birds

Suddenly, we hear a piercing cry:

"Aaaaaaahh!"

Huge sea birds are diving down on us. Death is falling from the sky!

I see the long sharp beak of one bird snap shut on the turtle beside me. He is swept off into the sky. Another bird swoops down. Then another and another!



The birds are fast, so there is no chance of running away. In fact, there is nothing I can do but hope that I will not be the next victim.

Fear spurs a new energy in me. My flippers shuffle frantically on the sand. I imagine myself in the water, free to swim. Delicious algae awaits there for me to eat. The cool salt water will soon be my home!

All around me the terrible attacks continue. Yet I understand that the sea birds are only following their instincts as well. These birds must eat. Young turtles are their food. This is Nature.

Still, *my* instinct drives me to be one who will survive.

Attack of the Crabs

I look ahead of me and see that the ocean is not far now. Perhaps I will make it after all! Three feet . . . two feet . . . one foot . . .


But wait! A horrible new danger now appears: dozens of hard-shelled creatures, armed with terrifying pincers. They run sideways, with great speed, on their many-jointed legs.

They are crabs.

The dreadful beasts spread out among us. Their pincers crush the soft shells of several tiny turtles around me.

A crab tries to block my way. I slip between its legs. Its lethal choppers clack above my head like castanets. Click-clack-click! The persistent crab lunges to the left, to the right, but I am one step ahead.





Reptiles and Amphibians

Scientists believe that *amphibians* (am fib' ē əns) were among the first animals to come on land. They evolved from fish around 400 million years ago. The first *reptiles* were descendants of amphibians. They appeared around 320 million years ago. That's about 100 million years before dinosaurs appeared. Amphibians and reptiles still thrive today, long after the extinction of dinosaurs.

There are about 12,000 species of amphibians and reptiles. All are vertebrates (vur'tə brāts), which means they have a spinal column in their back. They are also all cold-blooded, which means they must use their environment to warm or cool their bodies. The skin of most amphibians is smooth and moist, while that of reptiles is dry and covered with scales. Most amphibians lay eggs in water. Most reptiles lay eggs on land, but some reptiles develop in eggs that remain within the mother's body until they hatch. Most amphibians undergo metamorphosis (met'ə mōr'fə sis), changing their form as they develop into adults. However, as reptiles grow, they shed their skin, which is called molting.

■ **Metamorphosis of the frog**



The frog's eggs float on the surface of the water.



The tadpole is born with a long tail for swimming and with gills for breathing under water.



Little by little, the gills are replaced by lungs and the back legs begin to appear.



At 12 weeks, the eyes begin to protrude and the mouth widens. The tail disappears and the front legs develop.



When the back legs are well formed, the frog jumps onto land. Its lungs fill with air.



What Is an Amphibian?

Amphibians lead double lives. Most of them are born and undergo metamorphosis in water, but they then live mostly on land as adults. One example is the frog.

The skin of most amphibians is smooth and moist. Sometimes it has glands that produce a sticky coating; other glands may produce poison.

Unlike the skeletons of salamanders, most frogs have a short spinal column, very short ribs, and no tail.

Anura, including frogs, have squat bodies. The bodies of urodeles, which includes salamanders, are elongated, allowing them to crawl. Apoda have neither legs nor fins.

Frogs are oviparous and abandon their eggs in the water. Most salamanders are ovoviparous: the eggs develop and hatch in the body of the mother and the babies are born live.

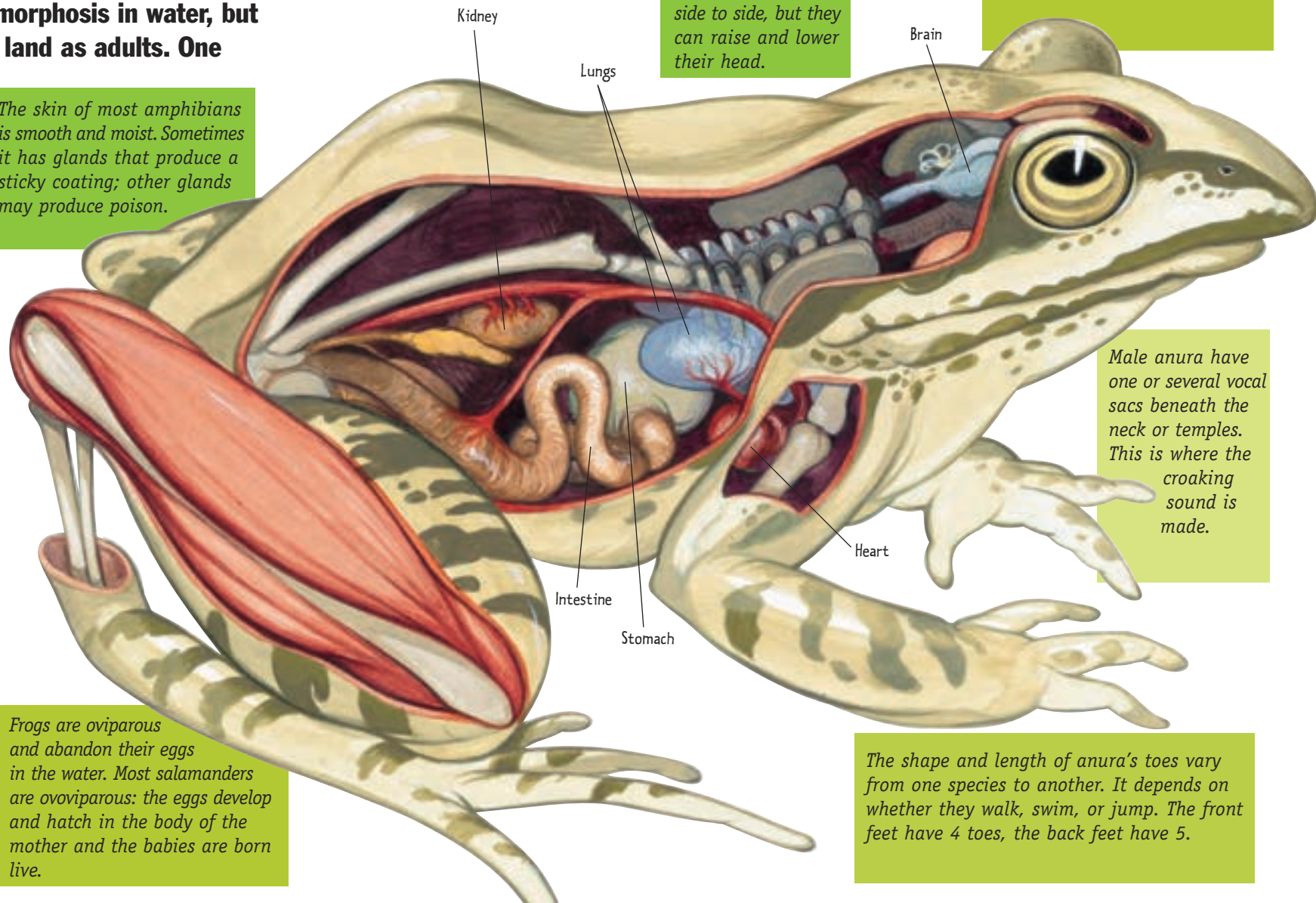
There are several different ways amphibians can breathe:
 — through the gills or lungs
 — through the skin if it is moist
 — through the mouth, which the animal fills with air (anura) or water (urodele).

Most frogs cannot turn their heads from side to side, but they can raise and lower their head.

All amphibians have eyelids. Anura's eyes have three.

Male anura have one or several vocal sacs beneath the neck or temples. This is where the croaking sound is made.

The shape and length of anura's toes vary from one species to another. It depends on whether they walk, swim, or jump. The front feet have 4 toes, the back feet have 5.



What Is a Reptile?



With or without legs, all reptiles are able to slither or crawl. One type of reptile is a rattlesnake.

In a snake's long body, the organs are tubular in shape (heart, lung). They are arranged one after the other or are reduced in size (left lung).

The snake never blinks its eyes. Its eye is covered with a clear eye cap that is shed when the snake molts.

Except for tortoises, all reptiles have teeth. The fangs of venomous snakes can inject poison. Tortoises have horned beaks.

The snake has elastic jaws and special bones, allowing it to swallow prey that may be larger than the snake.

Lacking eardrums, snakes are deaf, but they capture vibrations from the ground that are transmitted to the inner ear.

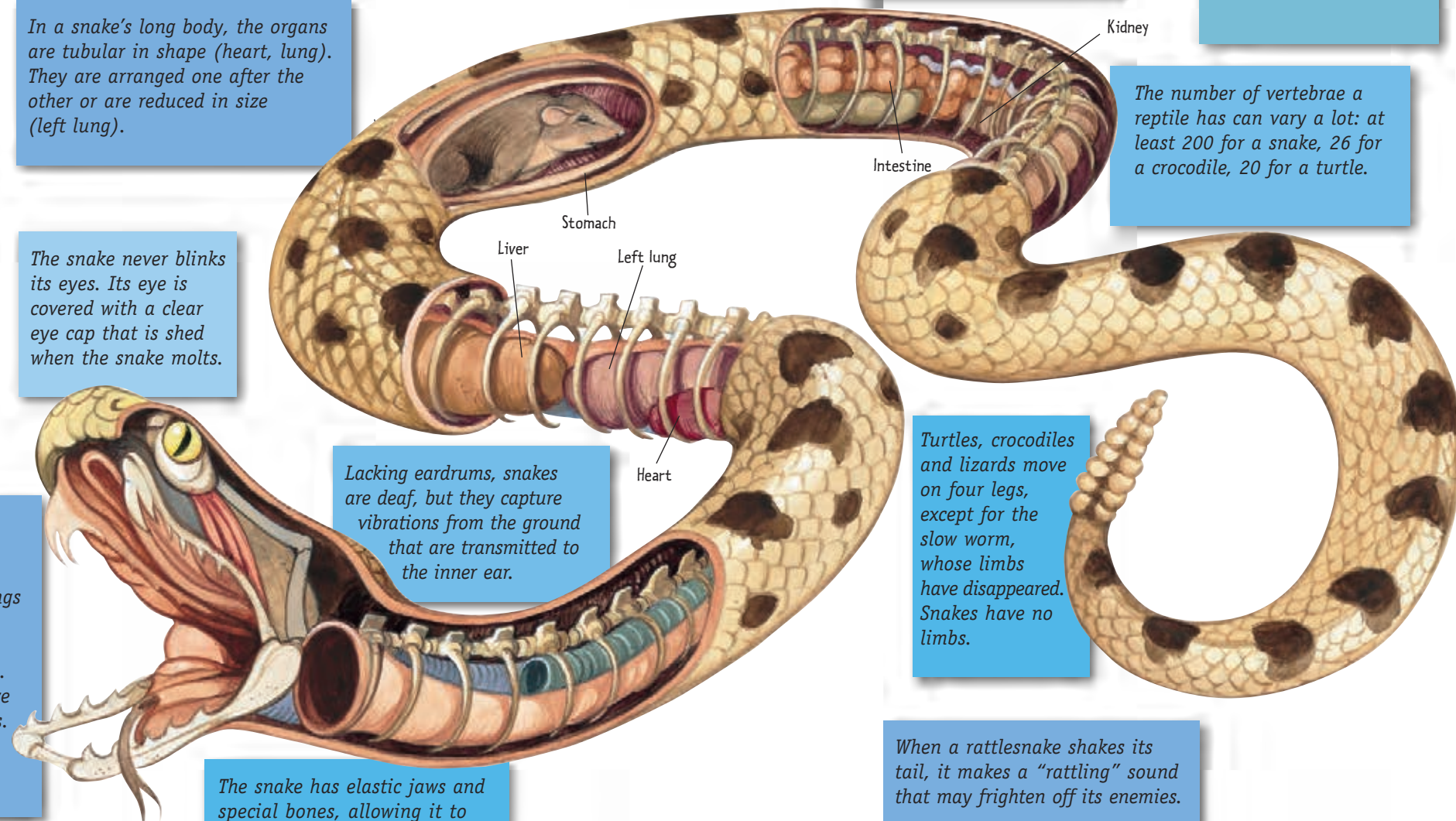
Oviparous reptiles (such as turtles and crocodiles) bury their eggs in a warm pit in the ground. Certain pythons and cobras incubate them by covering them with their bodies. Ovoviparous lizards and snakes incubate the eggs inside their bodies.

Reptiles have skin covered with scales. A tortoise's body is protected by a bony shell covered with horned plates. Crocodylians have bony plates on their bodies.

The number of vertebrae a reptile has can vary a lot: at least 200 for a snake, 26 for a crocodile, 20 for a turtle.

Turtles, crocodiles and lizards move on four legs, except for the slow worm, whose limbs have disappeared. Snakes have no limbs.

When a rattlesnake shakes its tail, it makes a "rattling" sound that may frighten off its enemies.



How a royal python molts

When it feels its skin is too tight, the python molts to get rid of the top layer of skin. It may molt several times a year depending on its size and age.



The full molting process lasts 6 to 10 days. First the snake's skin grows soft.



Its eyes become veiled with a bluish white covering. The snake cannot see as well. It becomes irritable.



The molting itself takes 1 to 2 hours. It begins at the head. The old skin breaks off from the lips and eyes, then turns inside out like a glove all along the body to the end of the tail.



Cold-blooded Animals

Unlike mammals and birds, amphibians and reptiles are cold-blooded animals. They regulate their temperature by taking advantage of their environment.



1 At night, the desert is frigid. The lizard buries itself in a lair that is 60° F. Its body temperature is 62.5° F.

2 In the early morning, the temperature is cool. The lizard warms itself in the sun on a rock. Its temperature can rise to 86° F in less than half an hour.

3 At mid-morning, the sun shines brightly. The lizard's dark skin absorbs the solar heat. Its temperature stabilizes at 95° F. It hunts insects and flees from predators.

5 In the afternoon, when the temperature drops, it "lounges" in the sun or on warm rocks to maintain its 95° F body heat. It digests during this time.

6 When the sun goes down, the lizard returns to its lair.

■ A day in the life of a lizard

A lizard seeks the right temperature by changing place and posture. It warms up by exposing itself to the sun to gather energy so it can hunt. But it is quick to seek shade when the temperature gets too high: this keeps its body from overheating.

4 At noon, the temperature nears 120° F. The lizard stays in the shade.

■ The squirming lizard

To walk on burning hot sand, the lizard does acrobatics. It lifts up its left front and right rear feet at the same time, allowing them to cool off. Then it walks a little more and pauses again to cool the other two feet.



■ Controlling its temperature

An iguana's skin changes color according to the temperature. In the early morning and late afternoon its skin is dark, to absorb the heat. In the hotter times of day, its skin is light, reflecting the sun's rays.



■ Recharging its batteries

To be active, reptiles must have energy. One way to get energy is to warm themselves by basking in the sun.



Daily Life

People often feel repulsed by amphibians. Yet they are animals with amazing abilities!



How do frogs orient themselves?

A group of frogs was accustomed to laying eggs in a certain pond. One day, workers filled it in and created a road. Entirely new smells spread through the area. Yet the following year, the amphibians came right back to the same spot . . . because they orient themselves by the sun, not by scent.

Record jumps

Not all frogs jump. Some swim, others walk, soar, or climb trees. Frogs that live in trees are impressive acrobats. Tree frogs that are only 1.2 inches long can sometimes jump two feet. Rocket frogs can jump up to 15 feet!

1 At rest, the frog is in a sitting position, its legs bent. The back legs rear up and the toes help it push off from the ground.

2 It extends its back legs to gain speed

3 It can catch an insect in midflight.

4 It lands softly on its feet.

5 With its adhesive toes, it can grip the stalks of plants or climb trees.



Beware: poison!

Poison dart frogs manufacture strong venom in tiny glands on their backs. The poison is not fatal to the touch. However, if the poison gets into a body through the mouth or a wound, the victim can be quickly paralyzed and die. South American natives used the poison in frogs like these to poison their darts. Other amphibians also produce poisons. The European spotted salamander secretes poison into the mouth of a predator, so the animal will release it. The poison in these animals is the way they protect themselves. Predators learn to leave them alone!

The cannibal newt

The great crested newt is quite the carnivore. It devours small shellfish, worms, snails, tadpoles, and insects. When it is starving, this voracious little animal can even become a cannibal: it eats other newts and even its own larvae.

great crested newt

Seeing, Hearing, Touching

Depending on their needs and where they live, reptiles use their senses in many ways.

■ Snakes have no ears.

How does a snake learn about the world without ears? It is very sensitive to vibrations in the ground as it slithers along. With a long forked tongue that it flicks out, it can sense the odors of plants and animals. Its large eyes, covered with a transparent protective film, are always on the watch.

■ The mighty crocodile

The crocodile floats near the surface of the river. Leaving only the top of its skull above water, it smells and hears everything around it. Nostrils are located at the very end of its snout to detect odors. It lies in wait to surprise its prey—then grabs and drowns the prey in the water.

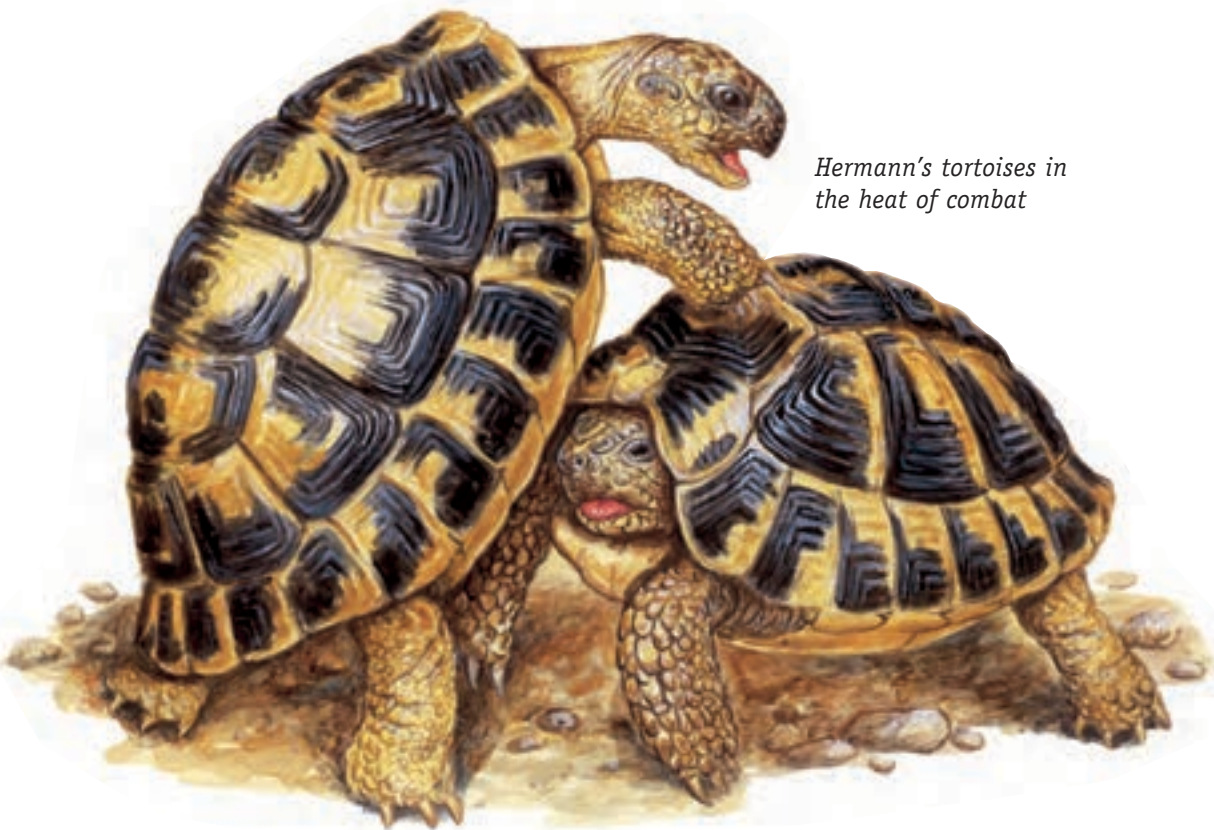


■ Hunting with infrared

Like many snakes, the pit viper is able to hunt at night. In total darkness, it can “see” using little cavities situated on each side of its head between the eyes and nostrils. These cavities can detect the heat or infrared radiation of a warm-blooded rodent. As soon as the prey moves, the viper attacks and injects its venom. Sometimes the rodent escapes, but the snake will soon find it again by the heat the rodent gives off.

The Turtle or the Egg— Which comes first?

It is always the same: combat between rivals, attracting a female, and egg-laying.



Hermann's tortoises in the heat of combat

■ Shell-to-shell combat

Two male turtles face off in front of the female, who stays on the sidelines. They rush at each other with the strength of a tank. Their shells strike and scrape each other. After two hours of intense fighting, one of them loses his balance. The other takes advantage of this and turns him over on his back, legs in the air. The victor leaves with the female he has won. The loser searches for a prop to turn himself back over again.



■ Eggs-actly!

In April, female ringed snakes take their first sunbath. They display their colored "necklaces" in the company of several males. One of them grows bold and approaches a female. In May, the males go away. In July, the females lay soft eggs, stuck together, beneath the grass. They hatch in September.

■ The leatherback sea turtle

The leatherback sea turtle goes ashore to lay her eggs. She digs a hole in the sand, where she lays 60 to 100 eggs. When she has finished, she is exhausted. She covers the eggs to hide them. Then she returns to the sea, sweeping the sand with her back feet to cover any trace of her presence so that predators do not know where the eggs are.



■ Swallowing an egg in its shell

The egg-eater snake (*Dasypeltis*) ingests huge eggs, shell and all. Thanks to its elastic jaws, it avoids breaking them.



When it has completely swallowed the egg, a bony saw in its esophagus slices the egg apart.*



The contents of the egg are released into the stomach. Delicious!



The reptile then spits out the pieces of shell.

Esophagus:
(*ĩ sof'e gəs*)
Digestive canal leading from the mouth to the stomach.



What's on the Menu

Snakes and crocodiles are carnivores. Lizards are insectivores, but some are also carnivores or herbivores (hur' bæ vors). Most land turtles eat plants, while sea turtles live on crabs, jellyfish, fish, and algae.



Boa devouring a gazelle

■ Boa eats boa

The boa constrictor takes up a post in a tree to watch for prey. This powerful snake from the tropics wraps its body around the mammal and crushes it before eating it. Its mouth stretches to swallow the animal, alive or dead. When it has fully ingested the prey, its scales spread apart. Its body relaxes. As the boa digests, it remains motionless for weeks or months.

Another type of boa is the anaconda. If two anaconda snakes grab hold of the same prey, the larger snake may simply swallow the smaller snake.



■ A sweet tooth for jellyfish

When the leatherback sea turtle fills its lungs with air, it can dive nearly 1,000 feet deep in the sea. There it feasts on jellyfish. It can hold its breath for 20 to 30 minutes. After it comes back to the surface to breathe, it plunges back down to the depths. Some sea turtles have mistaken a plastic bag for a jellyfish and strangled to death.



Protection From Predators

Turtles, snakes, lizards . . . different reptiles have different ways of escaping their enemies.

■ A protective shell

The turtle has a shell that surrounds and protects it. The shell is formed of bony plates that are joined beneath its belly. When danger appears, the turtle retracts its four legs, head, and short tail into this hard, solid shelter. Young turtles, however, are very vulnerable because their shells are still soft.



Attacked by a raccoon, a Blanding's turtle huddles in its shell.

■ Hiss

Snakes "hiss" in different ways. The sand viper rubs its coarse scales together and produces a vibrating raspy sound. When the rattlesnake shakes its tail vigorously, it can be heard over 30 feet away. The bull snake has a very loud hiss. A flap within its larynx* vibrates, amplifying the hiss when it expels air.

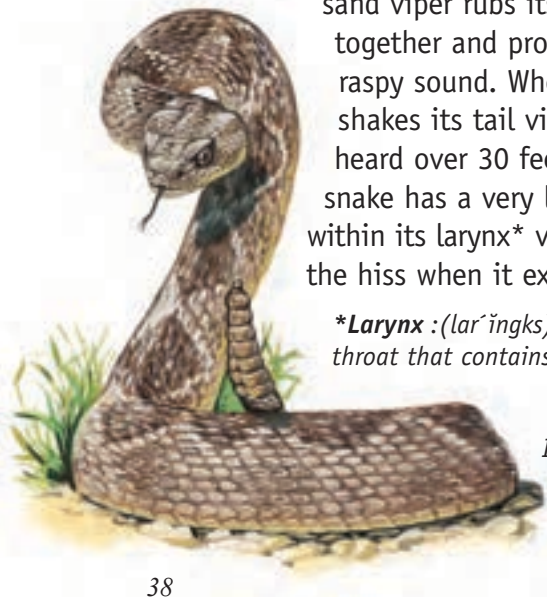
***Larynx** : (lar'ingks) Part of the inner throat that contains the vocal chords.



Sand viper



Bull snake



Rattlesnake



■ Play dead

When a predator approaches, a hognose snake will squirm, stretch, hiss, and pant to try to scare it off. But if the enemy persists, the hognose changes strategy. It plays dead, going stiff and motionless with its mouth open and its tongue hanging out. It seems to stop breathing. It even emits a smell of death.



Wow! It's growing back...



ahh, a nice new tail

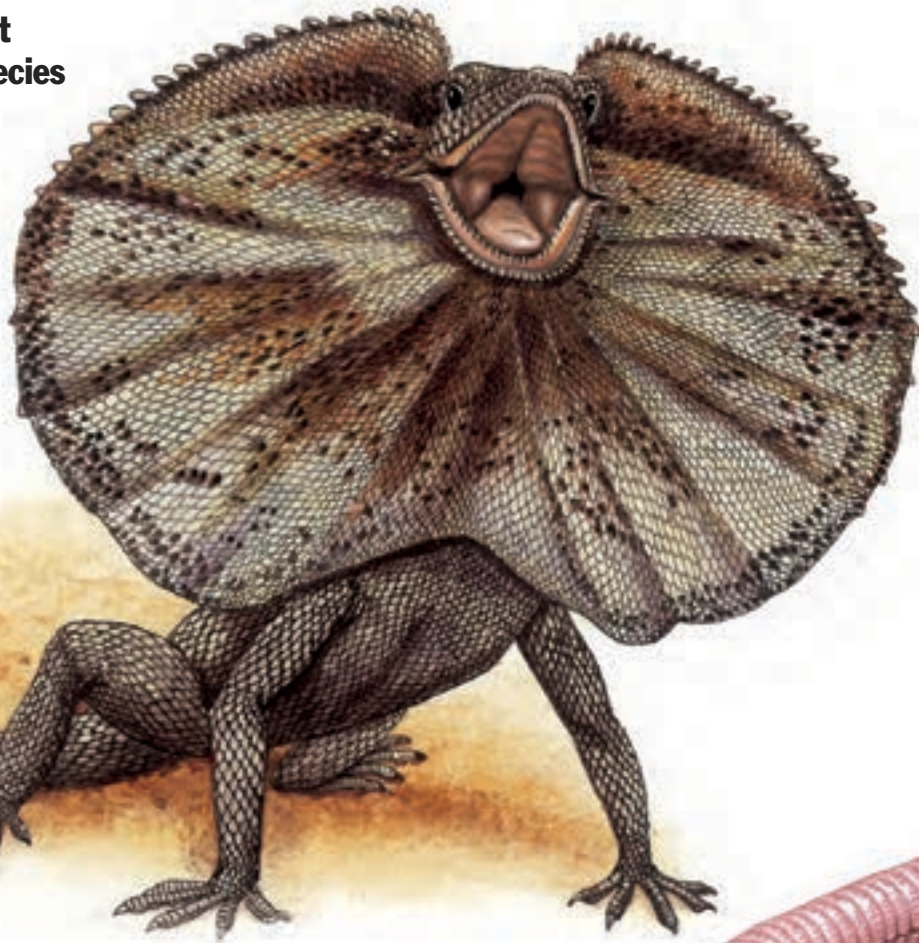


■ Lose a tail

When a bird of prey goes after a skink in the Australian desert, the reptile will break off its own tail to escape. The tail falls off, but grows back fairly quickly. The second tail is shorter and lighter in color than the first.

Strange Lizards

There are about **3,800 lizard species on the planet. Some of them are really amazing!**

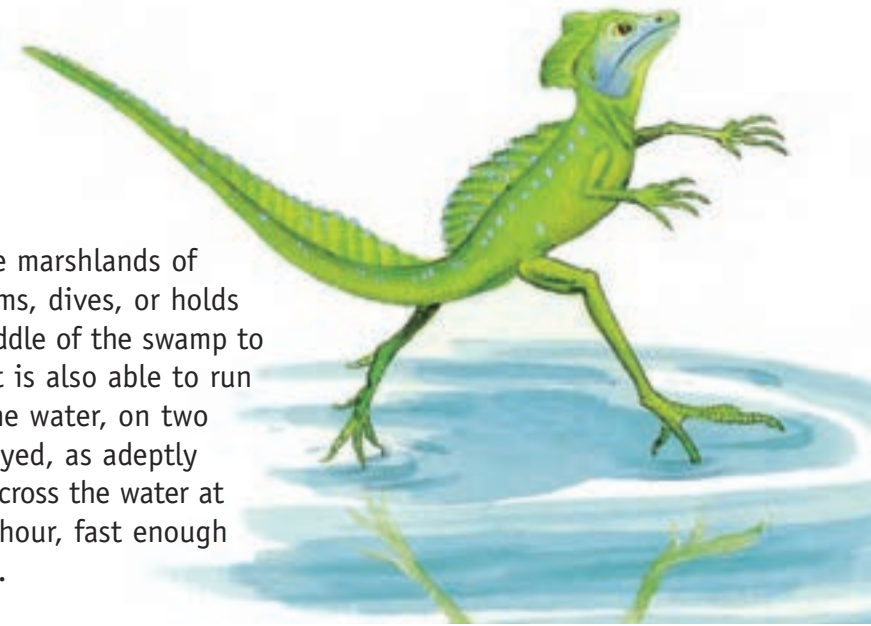


■ Scare your enemies

The frilled lizard, which lives in Australia and New Zealand, averages 33 inches in length. In its neck it hides a fold of skin that can lie flat or flare out into a wide collar. It flips it out suddenly, opens its mouth wide, and hisses to intimidate and drive off an attacker. It's all a bluff! Despite all the fanfare, the lizard has no real defenses.

■ Walk on water

The basilisk lives in the marshlands of Central America. It swims, dives, or holds perfectly still in the middle of the swamp to avoid a predator. But it is also able to run across the surface of the water, on two legs and with toes splayed, as adeptly as on land. It can run across the water at nearly 7 1/2 miles per hour, fast enough to keep it from sinking.



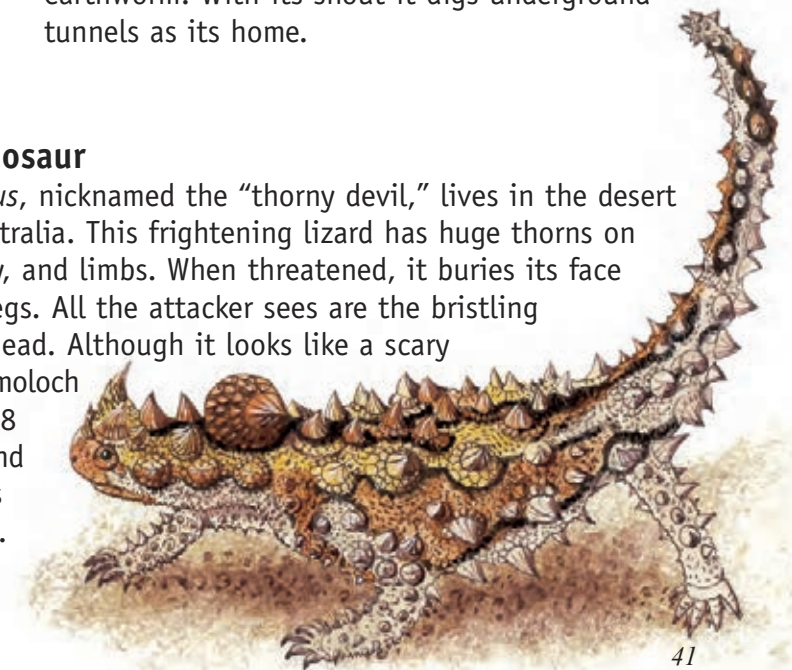
■ Which end is which??

The worm lizard looks like a blind snake. This odd reptile seems to have a head at both ends, but one is really a tail. A lizard without legs, it moves backward as easily as forward, like an earthworm. With its snout it digs underground tunnels as its home.



■ Little dinosaur

Moloch horridus, nicknamed the "thorny devil," lives in the desert of central Australia. This frightening lizard has huge thorns on its head, body, and limbs. When threatened, it buries its face between its legs. All the attacker sees are the bristling horns on its head. Although it looks like a scary dinosaur, the moloch is only about 8 inches long and eats only ants all year round.



■ It changes color

The skin of a chameleon can change color. Many scientists believe that for some types of chameleons, what they are feeling can affect the color of their skin. They become green if they are content, gray if they are in pain, or black if they are angry. When a chameleon's skin changes to brown, it can warm up better by taking in sun rays. Some of the colors, such as brown or green, can also help the chameleon blend into the colors of trees and help it hide from predators.



To move about, the chameleon clings tightly with its feet and moves them very carefully, one at a time. Its five toes act like pliers to grip a branch.

Its tail locks onto the branch and wraps around it to steady the lizard.



■ It makes a "big" impression

When an enemy appears, the chameleon puffs up its body. Its lungs and several inflatable sacs in its belly fill with air. Then it opens its mouth and rocks back and forth threateningly. When the danger has passed, it deflates.

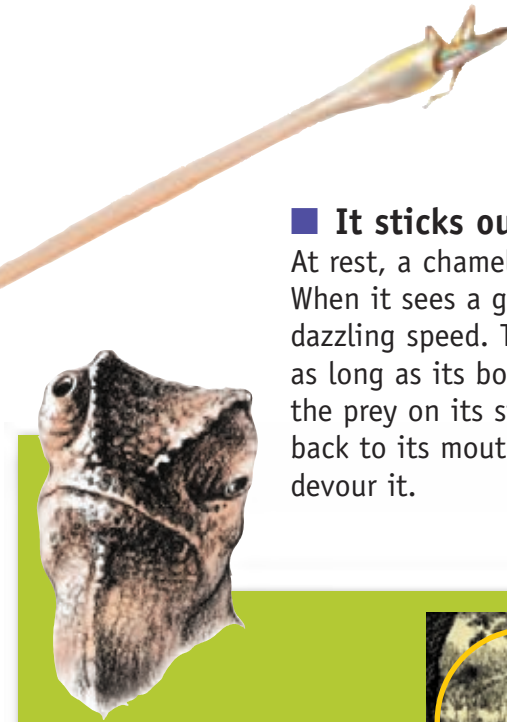


The Magic Chameleon

To survive in a hostile world, the chameleon has several ways to make up for its weaknesses.

■ It sticks out its tongue!

At rest, a chameleon's tongue folds up like an accordion. When it sees a grasshopper, its muscles activate with dazzling speed. The elastic tongue stretches to become as long as its body. With perfect accuracy, it captures the prey on its sticky tip. The lizard draws the insect back to its mouth, where its gummy lips grab and devour it.



■ It crosses its eyes!

The chameleon is a strange hunter. Very patient, it waits for hours to spot prey. Its eyes can move independently of each other and are ringed with a large protective eyelid.



1 With one eye, it explores the terrain and zeroes in on approaching insects.

2 With the other, it watches the spot where the insect will land. It attacks insects only when they are still.

3 The two eyes converge on its prey: its tongue darts out.

Tricky Maneuvers

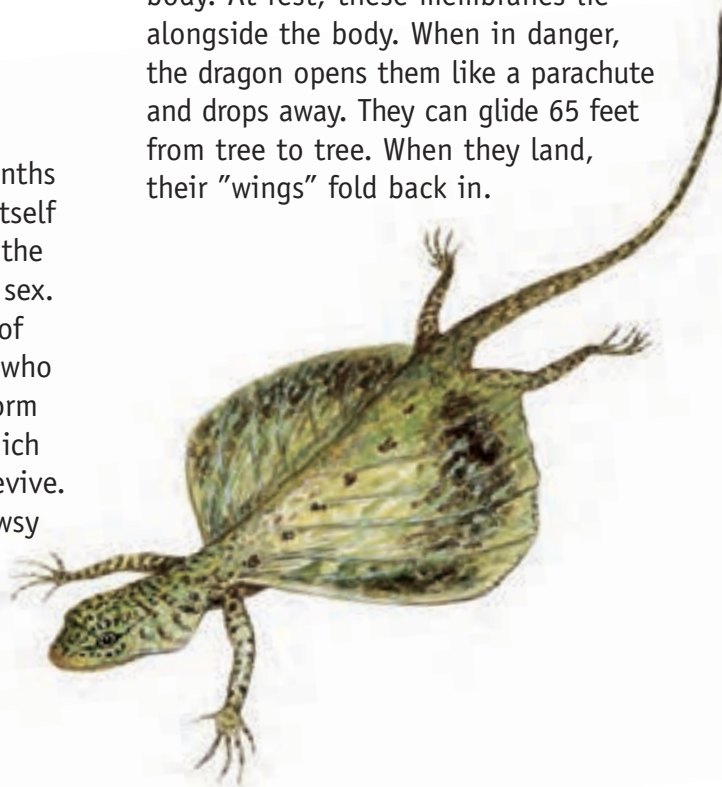
In every aspect of life, reptiles show their shrewdness. Some of the things they do . . .



■ Pretend to be female

When the male garter snake of Canada emerges from eight months of hibernation, it “disguises” itself as a female. How? It gives off the **pheromones*** of the opposite sex. The trickster attracts a swarm of other males (a hundred or so) who emerged before he did. They form a teeming ball around him, which warms him and helps him to revive. This also protects the still drowsy snake from predatory birds.

**Pheromone: (fer’ə mōn) Substance secreted by an animal that causes certain reactions in another animal of the same species.*



■ Fly like a dragon

Flying dragons (Draco volans) have “wings” formed by ribs and membranes that extend out from each side of their body. At rest, these membranes lie alongside the body. When in danger, the dragon opens them like a parachute and drops away. They can glide 65 feet from tree to tree. When they land, their “wings” fold back in.

Snakes that live in underbrush have intricate, interwoven designs.



Those that live in trees are often slim and willowy, with green or brown colors.

■ Use camouflage

To blend in with its surroundings, snakes wear camouflage.



Some harmless species escape from their enemies because they look like venomous snakes . . .



Those that live in sandy deserts are yellow, beige, or light brown.