

CREATURES OF THE SUN

A Natural History of the Painted Turtle

TURTLE FACTS:

The most remarkable feature of a turtle is its shell. The first turtles evolved during the Triassic period, developing bony or leathery shells — a skeleton-on-the-outside design — that would afford them enough protection to outlast the mighty dinosaurs.

A Painted Turtle's *carapace* (top shell) and its *plastron* (bottom shell) are made up of bones covered with *laminae*, a thin layer of horn-like material (*scutes*) that is similar to our fingernails in composition. The shell is actually a fusion of the ribs, backbone and bony plates. The carapace alone consists of roughly 50 fused bones.

As the shell evolved, so did the unusual position of the turtle's limbs. Unlike other four-footed animals, the turtle's shoulders are located inside its ribs. The limbs of turtles are adapted to suit the conditions of their habitat. Many land turtles (tortoises) have hind legs resembling those of elephants that help support their weight, while sea turtles use their flippers to "fly" through the water, and semi-aquatic turtles like the Painted Turtle have webbing between their toes.

Turtles have keen eyesight and a good sense of smell. Their hearing is not well-developed, but their bodies are sensitive to vibrations. Their jaws are toothless, sharp, shearing beaks.

Turtles have no vocal chords, but some of the larger species of sea turtles and tortoises can exhale air through their throats or grind their jaws together to create sounds. *This usually occurs during mating.*

Turtles are commonly thought to be cold-blooded. In fact, they are *ectotherms*, which means their body temperature is largely dependent on that of the surrounding environment. Turtles in temperate climates are active when it's warm and "shut down" when it's cold. *This adaptation allows the Painted Turtle to survive for up to six months of winter at the bottom of a pond without taking a breath.* A turtle's need for oxygen at near-freezing temperatures is greatly reduced, and it absorbs what little oxygen it needs directly from the water, through blood vessels in the throat lining and *cloaca* (anal opening).

Hatchling Painted Turtles in the northernmost regions are no less remarkable in their ability to survive long, cold winters. They emerge from their eggs in the fall, yet remain in the nest, where temperatures can fall well below freezing. Scientists are still researching the freeze tolerance and freeze avoidance capabilities of these tiny hatchlings.

Because turtles experience high juvenile mortality and are slow to mature, these ancient animals are vulnerable to the effects of humans. While their habitats are being destroyed, they are being overcollected for food and for the pet trade.

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*"For if you can begin to see another creature — really see it as worthy of respect, as a unique, successful being — your ways of treating it and the world around you must improve." — Richard Nicholls, from **Turtles****

Educators will find **Creatures of the Sun: A Natural History of the Painted Turtle** to be a valuable component of environmental studies, science, biology, geography and Canadian studies curricula. Here are some projects and questions that can be applied before or after screening the video.

1. There are four sub-species of the Painted Turtle: the Eastern, Midland, Western and Southern. They can be found in marshes, ponds and small lakes throughout much of North America. Find a book on reptiles and identify the different sub-species of the Painted Turtle. Compare them to other species of turtle. How have turtles adapted to different environments? A drawing exercise could be incorporated into this research, to show physical and behavioural variations. *Discuss the importance of observation and keeping records in scientific study.*
2. Discuss the importance of wetlands and of conserving the natural environments within your community. After viewing the video, raise questions such as: What are some of the ways that pond environments can be damaged by people? How are Painted Turtles and other pond creatures affected? *What can we do to protect them?*
3. Identify the pond life in the video and/or take a field trip to a pond to observe a natural ecosystem in action. Keep a "nature journal" to identify and record the plants and animals that you see. (Try to disturb the ecosystem you visit as little as possible). Create your own "pond" by making a collage of images of the plants and animals that live there.
4. The video shows how the Painted Turtle adapts to changes in the climate. Have your students investigate the adaptive strategies of other animals that help them survive changes in seasons.
5. Research turtle legends — there are many cultures that have myths and stories about turtles. For instance, some cultures believed that the world rested on the back of a giant turtle, and "Turtle Island" is the basis for the creation myths of several North American First Nations peoples. Do incarnations of the turtle appear in modern popular culture? Discuss images of turtles found on TV, in literature or as part of expressions such as "slow and steady wins the race."

SUGGESTED READING:

Caroll, David M. *The Year of the Turtle*. St. Martin's Press, New York, 1996.

Ernst and Barbour. *Turtles of the World*. Smithsonian Institute, 1989.

Behler and King. *Audubon Society Field Guide to North American Reptiles and Amphibians*. Alfred A. Knopf, 1989.

(*Published by Running Press, Philadelphia, 1977)

