



## Teacher's Guide

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## Teacher's Guide

### *Going Wild: Amazing Animal Adventures In the Desert*

#### The Book

*Going Wild: Amazing Animal Adventures In the Desert* offers children an exceptional and engaging view at some of the most interesting and extreme environments on this planet—deserts. Written by Brian Keating, one of Canada's foremost naturalists, this book teaches children about the extreme environment, weird wildlife, and conservation efforts in desert landscapes. Brian's own stunning photographs accompany his lively and entertaining stories, detailing some of his most exciting wildlife-watching escapades. In this book, Brian takes young readers on a journey as he discovers:

- Scorpions glowing green off the side of the road in Arizona
- Two bull muskox in the Canadian Arctic, butting heads with a loud "CRACK"
- As many as 50,000 elephants in Africa's Chobe National Park and the Savuti
- A strange lizard diving into the sand in Africa's Namib Desert—using its nose as a shovel!

#### The Author

Brian Keating is a keen naturalist, avid outdoorsman, world traveller, intrepid adventurer, and extraordinary spokesperson for the world's wild places and the creatures that inhabit them. His first job with the Calgary Zoo in 1981 was in their education program. Now Brian is head of the zoo's Conservation Outreach Department, and responsible for national and international conservation projects, such as the Wechiau Hippo Sanctuary in Ghana, West Africa, and the nature-based eco-tour program that he started in 1983.

Keating has been a weekly guest on local CBC Radio for nearly two decades and has been featured bi-weekly on the Discovery Channel for the past seven years. In addition to his fulltime job at the zoo, Keating is an Adjunct Assistant Professor of Anthropology at the University of Calgary, a pilot, a scuba diver, and mountaineer.

## The Teacher's Guide

The *Going Wild: Amazing Animal Adventures In the Desert Teacher's Guide* is an instructor resource that correlates to *Going Wild: Amazing Animal Adventures In the Desert*. The activities in this guide can be used individually or as a series of lessons, depending on the requirements of the teacher. Activities are drawn from the Science curricula of several provinces in Canada for grades five to eight, with particular emphasis on the units focusing on: Weather Systems (Grade 5), Diversity of Living Things (Grade 6), Interactions and Ecosystems (Grade 7), and Freshwater and Saltwater Ecosystems (Grade 8). Students will be encouraged to analyze and interpret, perform and record, initiate and plan, and practice communication and teamwork skills. They will create models; discuss; debate; research; plan; and execute presentations; and initiate, plan, and create examples of conservation organizations.

**Humanities connections:** While all activities draw from Science curricula, activities one and four also have strong Social Studies and Language Arts connections. Activity one draws on a variety of grade-six curricula standards, Meeting Human Needs—Local Government and grade seven curricula, Culture; activity four relates to the grade six curriculum, Meeting Human Needs—Local Government. The extended connections these activities have with Humanities curricula make the book an excellent cross-disciplinary tool in any classroom. At the beginning of each activity is a section outlining Skills, Science, and Humanities Focuses for the activity, which will help teachers to choose activities based on Humanities and Science curricula.



I remember photographing these blue-footed boobies in the Baja Desert of Mexico. I could see bits of feathers popping off and floating in the wind like the fluff from a dandelion when you blow it.

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## Activity 1

### Coming Together: A Conservation Summit

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**Skills focus:** communication and teamwork; initiating and planning; analyzing and interpreting; performing and recording

**Science focus:** human impacts on the environment; human wants and needs impacting the environment; personal and public decisions that impact the environment

**Humanities focus:** impact of environment on human communities and cultures; local governments

Brian Keating describes his early interest in wildlife conservation and the importance of conservation initiatives in his introduction (pp. 4-5). “Returning Nature’s Cattle” (pp. 40-45), which describes efforts taken to replenish lost wildlife due to cattle ranching in southern Zimbabwe, is a prime example of a successful conservation effort.



Part of what spurred Clive Stockil on to create the Savé Valley Conservancy was the threat against the black Rhinoceros. It was being poached into extinction! Now the conservancy is working to protect these massive creatures.

Ask students to read “Returning Nature’s Cattle” (pp. 40-45). Then, split the class into three groups: the first group will represent the Zimbabwean government, the second will represent the ranchers (with one student in the group to play the role of Clive Stockil), and the third group will be asked to represent village elders and leaders.

Have groups prepare to attend the conservation summit by leading a class discussion about the benefits and drawbacks of introducing domestic cattle to

southern Zimbabwe. Be sure to touch on long-term and short-term benefits/drawbacks. Next, have each group write a conservation report, which they will present at the summit. Each group's report will be written from the point-of-view of their assigned roles, detailing their agenda and the reasons why they either support or oppose introducing domestic cattle to southern Zimbabwe. Reports should highlight:

- The main people and agendas each group represents in their given roles (i.e. government represents the country's larger social and economic requirements; village elders and leaders represent the needs of the villagers; cattle ranchers represent their businesses)
- Their relationship to the environment
- Environmental concerns and/or suggested benefits from cattle ranching
- Short-term benefits/drawbacks
- Long-term benefits/drawbacks

Groups should select one member to deliver the report at the summit. After all three groups have presented, open the floor to questions, allowing time for discussion.

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## Activity 2

### Web Wise

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**Skills focus:** performing and recording; initiating and planning

**Science focus:** ecosystem connections; biodiversity; food chains and food webs; producers, consumers, decomposers

Ask students to select an ecosystem mentioned in any of the following stories: "The Okavango's Termite Islands" (pp. 10-13), "Coyote Laughter and Newspaper Rock" (pp. 26-31), and "Upside-Down Galahs Down Under" (36-39). Next, ask them to research and draw a food web illustrating their chosen ecosystem. Tell students to choose at least five species present in the ecosystem, naming each one as producers, consumers, or decomposers. After the food webs have been created, encourage students to look at their food webs and choose one of the species for further research (using Internet and other sources). Tell them to outline the main threats to their chosen species.

- What would happen if the species decreased in population?
- How would such a decrease in population affect the ecosystem?
- Suggest ways in which conservation efforts could help save the threatened species.

## Activity 3

### Desert Plant Adaptations

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**Skills focus:** analyzing and interpreting; communication and teamwork

**Science Focus:** adaptations necessary for interaction and interdependence; benefits of adaptations to species in specific environments; factors causing adaptations to specific environments; the impact of human wants and needs on the environment

Many desert plants, according to Brian Keating, have special adaptations that allow them to withstand, and even thrive, in the extreme desert climate. Even soil may have different adaptations in the desert. In order to survive in the desert, plants must develop special adaptations. For instance, most desert plants and animals must deal with lack of water. Instruct students that there are three main ways that plants adapt to desert environments: succulence, drought avoidance, and drought evasion. To prepare for the lesson and learn more about these survival adaptations, have students visit the following website:

<http://eebweb.arizona.edu/links/desert/adaptations.htm>



The barrel cactus flowers from July through to September. The beautiful orange, yellow, or red flowers make way for barrel-shaped fruit that deer and other animals eat. This cactus grows faster on its shady side. This causes it to tilt toward the south, which gives it the nickname “the compass cactus.”

Divide the class into two groups. Ask the first group to read “Like Toothpaste from the Sand,” and the second group to read “Coyote Laughter and Newspaper Rock.” Have the groups find all of the desert plant and soil adaptations Keating describes in the two stories. The groups should then present their list of adaptations to their classmates, focusing on the following question: How do a desert plant species’ specific adaptations allow it to fit into

its ecosystem? For specific examples of plant adaptations, see pages 20 (the welwitschia plant and its long, stringy leaves), 29 (cryptobiotic soil and its “matting” qualities), 29 (the ocotillo plant and its leaves), and 29–30 (the prairie silver willow and its “umbrella” leaves). Each group should be challenged to make a group choice for the most unusual adaptation.

When the presentations are complete, ask each student to choose a plant from the stories presented, or from any of the stories in the book, and create a poster with labels that describe the plant’s special adaptations to its environment. As a bonus activity, have students write a paragraph explaining what the consequences of desert adaptations are for their chosen plant. How is the plant affected by its adaptations to the desert environment?

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## Activity 4

### Australia’s Foreign Animals

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**Skills focus:** performing and recording; communication and teamwork; initiating and planning; analyzing and interpreting

**Science focus:** human impacts on the environment; human wants and needs impacting the environment; personal and public decisions that impact the environment; interdependence of species; environmental stability

**Humanities focus:** Impact of environment on human communities and cultures; local governments

In “Upside-Down Galahs Down Under” (pp. 36–39), Brian Keating tells us that Australia’s ecosystem has been affected by the introduction of foreign animals. To provide a background, tell students that not all species are native to a given area. These species can be introduced into an environment in several different ways. When people move to a new and unfamiliar area, many bring the plants and animals that were familiar in their previous home. Other times, foreign animals are brought for agricultural reasons, or even as pets. Still, foreign animals can hurt their new ecosystem. Because the native species of this area have not had the opportunity to evolve with the species, they have not developed a way to defend themselves against these new predators or competitors. Foreign animals may become predatory, hunting and diminishing the population of their prey. They may also compete with native species for food and other resources. For these and other reasons, the introduction of foreign animals, if successful in a new habitat, can cause many problems and can damage the ecosystem.

Ask students to read “Upside-Down Galahs Down Under” (pp. 36–39), paying particular attention to Keating’s reference to the wild horses (brumbies) and rabbits (p. 38)—these are both foreign animals that have been introduced into Australia’s ecosystem. In fact, both animals have had an impact on Australia’s ecosystem. Keating tells us about the rabbits:

Foreign animals introduced into Australia’s ecosystem hit the continent hard. Someone brought rabbits into the Australian deserts in the late 1800s, and since then these rabbits have increased in numbers into the billions in just 100 years. Now rabbits invade most of Australia’s ecosystems and have quite literally turned what used to be beautiful flowing grasslands into complete deserts (p. 38).

Next, divide students into two groups, teams of 4–5 students. Each group should choose a Canadian or Australian invasive species and find out how these foreign animals were brought to the country. The feral horses living near Suffield, Alberta, are a fine example. Each group should prepare a presentation that:

- explains where these foreign animals live in Australia or Canada today
- lists the ways in which these foreign animals damage the ecosystem
- explains the challenges associated with minimizing threats to the ecosystem
- provides reasons behind the population explosion.



Dee and I came across wild camels brought to the Simpson Desert from Arabia. Camels have many adaptations that allow them to survive in deserts—their noses close down, they recycle water and can go for long periods of time without water, and they store water in the fat of their humps.



## Activity 5

### Animal Adaptations

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**Skills focus:** analyzing and interpreting; performing and recording; communication and teamwork

**Science Focus:** adaptations necessary for interaction and interdependence; impacts of species actions on ecosystems; benefits of adaptations to species in specific environments; factors causing adaptations to specific environments; the impact of human wants and needs on the environment

Throughout the book, Brian Keating tells us about the special adaptations animals have made to fit into their ecosystems. In desert conditions, adaptations are necessary in order to withstand the extreme desert climate. For instance, most animals must deal with lack of water and have special adaptations to do so.

Ask students to read the following references to animal adaptations: In “Like Toothpaste From the Island” (pp. 18-21), Keating describes various animal adaptations in the Namib Desert (gemsbok, shovel-nosed lizard, darkling beetles, desert elephants). Later, in “A Snake Escape” (pp. 32-35) we learn about the different adaptations of animals in southern Saskatchewan and Alberta, Canada (prairie dogs, pronghorn antelope, and snakes). With these two different ecosystems in mind, how do a species’ adaptations help it to fit into its environment? Focusing on the animals mentioned in these passages, have students research (using the Internet and other sources) and describe the characteristics of at least three to learn how their adaptations ensure their survival in the harsh desert environment. There are many more examples of animal adaptations, so encourage students to find others in the book.



I've seen films showing a shovel-nosed lizard dashing across the desert sand and then picking up its legs when it stops because the sand is too hot. It looks like it's doing a strange jig. It's like the dance you would do if you stood on hot pavement in bare feet. You can almost hear the lizard saying, “Ouch, ouch” as it's picking up its feet. ☐ A split second after I released this shovel-nosed lizard, it disappeared into the sand, like a fish in water. I tried to find it again, but the escape artist had vanished leaving only imprints in the sand.

## Activity 6

### Different Desert Biomes

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**Skills Focus:** analyzing and interpreting; performing and recording; initiating and planning

**Science Focus:** ecosystem connections; biodiversity

Explain to the class that a biome is a regional ecosystem characterized by distinct types of vegetation, animals, and microbes that have developed under specific soil and climatic conditions. Ask students to visit the following website on desert biomes:

<http://www.ucmp.berkeley.edu/glossary/gloss5/biome/deserts.html>

Here, we learn that desert biomes can be classified according to several characteristics. There are four major types of deserts:

- hot and dry
- semiarid
- coastal
- cold

Next, instruct students to skim through the entire book, listing as many desert environments they can find [Arizona, Africa (Kalahari Desert, Namib Desert), Mexico, Arctic (Somerset Island), Utah, southern Saskatchewan and Alberta, Australia]. After they have created their lists, produce a colour biophysical map on a corkboard and have students put pins into each of the locations on the map. The locations into which they place their pins will likely all be brown! Encourage students to go back to the website provided above to research these areas and to classify their locations according to the four main desert biomes. What are some commonalities shared between all of the desert biomes? What are some of the differences?



The beautiful Sally Lightfoot crab lives in the intertidal zone between a coastal desert and the sea in Baja Mexico.