

## **Evolution And Adaptation For Young Scientists**

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## EVOLUTION AND ADAPTATION FOR YOUNG SCIENTISTS

**Adaptation.** Alvin Silverstein, Virginia Silverstein, and Laura Silverstein Nunn. Lerner (Twenty-First Century Books), Minneapolis, MN, 2007. 112 pp., illus. \$31.93 (ISBN 9780822534341 cloth).

**Finding Home.** Sandra Markle. Charlesbridge, Watertown, MA, 2008. 32 pp., illus. \$15.95 (ISBN 9781580891226 cloth).

**Great Extinctions of the Past.** Randi Mehling. Chelsea House, New York, 2007. 72 pp., illus. \$30.00 (ISBN 9780791090497 cloth).

**Hello, Bumblebee Bat.** Darrin Lunde. Charlesbridge, Watertown, MA, 2007. 32 pp., illus. \$15.95 (ISBN 9781570913747 cloth).

**Hide and Seek: Nature's Best Vanishing Acts.** Andrea Helman. Walker and Company, New York, 2008. 40 pp., illus. \$16.95 (ISBN 9780802796905 cloth).

**Please Don't Wake the Animals: A Book about Sleep.** Mary Batten. Peachtree, Atlanta, 2008. 32 pp., illus. \$16.95 (ISBN 9781561453931 cloth).

**Stones and Bones.** Char Matejovsky. Polebridge Press, Santa Rosa, CA, 2007. 32 pp., illus. \$19.00 (ISBN 9781598150049 cloth).

**Super Crocs and Monster Wings: Modern Animals' Ancient Past.** Claire Eamer. Annick Press, Toronto, Ontario, 2008. 96 pp., illus. \$19.95 (ISBN 9781554511303 cloth).

**Twilight Hunt.** Narelle Oliver. Star Bright Books, Long Island City, NY, 2007. 40 pp., illus. \$16.95 (ISBN 9781595721075 cloth).

**When Rain Falls.** Melissa Stewart. Peachtree, Atlanta, 2008. 32 pp., illus. \$16.95 (ISBN 9781561454389 cloth).

**Where in the Wild? Camouflaged Creatures Concealed...and Revealed.** David M. Schwartz and Yael Schy. Tricycle Press, Berkeley, 2007. 44 pp., illus. \$15.95 (ISBN 9781582462073 cloth).

From the scientist's standpoint, evolution and adaptation are the forces underlying all of biology. Understanding these basic processes is a critical part of the development of a young scientist's mind. Animal and plant physical and behavioral adaptation, ecological interactions, and evolutionary change are fascinating science topics that deserve exploration and demand explanation. To encourage the interests of young readers—and to get our earliest readers started—a selection of excellent titles are offered here, which focus both on process (e.g., evolution, geological change) and on product (i.e., physical and behavioral adaptations).

For the very youngest readers and listeners, three different picture books combine a focus on adaptation and behavior with the gentle cadence of a bedtime story. *When Rain Falls* (ages 3 to 6) opens with two children running from a rainstorm into their house, then turning to peer out the window and

wonder what happens to animals as the rain comes down. Author Melissa Stewart presents animal behavior from four different habitats: field, forest, wetlands, and desert. Animals include not just those foremost in a child's mind of what "wildlife" may be (squirrels, deer, chickadees, perhaps foxes) but also examples that may appear less noticeable



(beetles, spiders, ants, and bees, among others). The easy text, simple concepts, and focus on the diversity of the natural world all capture the attention of young

readers and listeners. Lovely watercolors by Constance Bergum illustrate the book. (Her picture of whirligig beetles circling on the surface of a green pond as the drops come down makes you feel as if you are standing at the pond's edge in the storm.)

The book's sole focus on the reaction of animals to the rainstorm, although an engaging premise, becomes the book's single flaw: it lacks any discussion of the role of rain in an ecosystem, the importance of water conditions in defining types of biomes, and the interdependence of water and plants within the four chosen habitats. (I waited in vain for a page on the famous desert bloom following a rainstorm.)

For the slightly older listener or reader, the book *Finding Home* (ages 4 to 7) is a beautifully illustrated tale of a koala bear and her baby, driven from their forest home by a brush fire. As they hunt for new eucalyptus trees for food and shelter, various dangers created

by humans threaten them at each turn, yet it is the care of humans that enables the koala and her joey to find their new home. Skillful watercolor illustrations by Alan Marks place the reader alongside the koalas as they flee the fire and shy away from barking dogs and glaring flashlights. The concept of animal adaptation to a particular environment is certainly emphasized by the mother koala's desperate search for a suitable home, checking the air constantly for the scent of her much-needed eucalyptus trees. Reading this book would provide an excellent opportunity for discussion of both the negative impacts humans have on the environment and the positive steps that individuals can take to protect it—even such a gentle, small action as standing back quietly to allow a koala and her baby to cross a road to safety.

The night world and sleep are the focus of *Hello, Bumblebee Bat* (ages 3 to 6), a perfect bedtime book for a very young reader. Written in a soothing question-and-answer chant, mammalogist Darrin Lunde describes the habits and adaptations of the smallest variety of bat. The book has a quiet, contemplative feel, with nighttime illustrations of bats as they soar over grasses and roost in caves. The charm of these watercolor and ink drawings by scientific illustrator Patricia J. Wynne will appeal to readers of any age. The book offers an excellent introduction to the natural history of this animal, including the threat of habitat destruction by humans.

Lunde and Wynne have deliberately kept the text and illustrations simple for their audience, perhaps at times to the detriment of clarity. For example, the page describing the bat's measurements cries out for the "actual size," and the illustration depicting echolocation lacks significant explanation. Overall, however, *Hello, Bumblebee Bat* offers a wondrous first glimpse at the concept of wild animal behavior and specific adaptation.

Another bedtime book for a broader age range is *Please Don't Wake the Animals: A Book about Sleep* (ages 3 to 8), written by Mary Batten and illustrated by Higgins Bond. Depending on the age

of the reader, the child can choose between the larger text accompanying each illustration or the short, informative paragraphs found on each page. The sleep habits of a multitude of animals are discussed, ranging from well-known ones (horses sleep very little, and do so standing up; bats sleep a lot, and do so upside-down) to those less familiar and quite amazing (swifts sleep while flying as high as 10,000 feet;



parrotfish build mucus cocoons in which to sleep; and the impressively large giant weta, a six-inch cricket-like insect from the mountains of New Zealand, freezes solid each night, thawing each morning to resume its normal activities). Beautiful and detailed illustrations fill each two-page spread. This handsome and informative book would be a valued addition, as well as a useful nonfiction resource, to any child's library.

The following three books take advantage of the parallels between a child's fondness for hide-and-seek games and the very real necessity for concealment and camouflage in the natural world. *Hide and Seek: Nature's Best Vanishing Acts* (ages 4 to 7), by Andrea Helman, is the most straightforward of these. Photographs are arranged by habitat ranging from grassland to ocean to the Arctic. The bottom of each page discusses the animal in its environment, and additional information about each animal can be found in the back of the book. Snakes, sea otters, owl butterflies, tigers, sloths, and praying mantids are a few of the animals shown. These beautiful photographs of animals in their habitats are captured by Gavriel Jecan, whose images appear regularly in publications like

*National Geographic*, *Outside*, and *International Wildlife*.

Two other hide-and-seek books capitalize on the game of trying to find what is well concealed. The award-winning book *Where in the Wild? Camouflaged Creatures Concealed...and Revealed* (ages 4 to 8) takes this theme to a new dimension. An "eye-tricking" photograph by Dwight Kuhn showcases each scene of a camouflaged animal, opposite an "ear-tickling" poem by David M. Schwartz and Yael Schy. The pictures then fold out to reveal the location of the hidden animal and information on each one (a wolf, a crab spider, deer fawns, pepper moths, and plover eggs, among others). Well-written factual comments keenly identify the characteristics of each animal and the relation to its habitat, emphasizing the importance of camouflage to survival in the natural world.

Also beautifully presented is Narelle Oliver's *Twilight Hunt* (ages 4 to 8). Readers follow a screech owl on her night hunt as skillful linocut illustrations depict hidden surprises in each picture. Insects, frogs, moths, and lizards are cleverly rendered, as is the owl herself, flying off one page and onto the next to hide with the other creatures in the ecosystem. Young readers will love the treasure hunt as they learn the importance of camouflage to surviving in the wild. They can also begin to get the idea of searching carefully, perhaps taking this developing skill of observation outside. Index pages provide keys to finding all the hidden animals and, for older readers, information on camouflage, disguise, and animal behavior. This is a picture book to be enjoyed repeatedly and at many levels—it is excellent science in tandem with excellent artistic presentation.

*Super Crocs and Monster Wings: Modern Animals' Ancient Past* (ages 9 to 12) and *Great Extinctions of the Past* (ages 10 to 14) are two highly informative, enjoyable books on evolution and evolutionary change for upper-elementary and middle-school readers. *Great Extinctions* is part of an eight-volume set produced with assistance from *Scientific American*, the oldest con-

tinuously published magazine in the United States (the entire set is written by authors affiliated with the magazine or approved by its editors). This book by Randi Mehling gives a clear presentation of fossils, extinctions (including a careful and detailed explanation of the evidence surrounding the Chixalub crater), survival of mass extinction, and Earth's current extinction crisis. The sophisticated yet readable text is accompanied by a glossary, a bibliography, a list of references for further exploration, and an index. *Great Extinctions* would be a useful addition to any middle-school library and interesting to any student learning about geologic history.

*Super Crocs*, by Claire Eamer, is a less conventional but equally good presentation of both adaptation and the scientific process. The book is so much fun that readers may not realize how much they are learning. Both ancient and modern creatures are depicted, as well as the connections between them. ("These animals didn't vanish altogether. Their distant relatives live among us today.") Jazzy layouts with varied fonts, colors, and images highlight several ancient animals (e.g., giant dragonflies, giant sloths, and giant armadillos, as well as the book's namesake) together with their modern relatives. Geological history, the process of fossilization, and many fascinating details about these individual creatures (including the amazing Devil's Corkscrew) are easily digested, and if a child wants more, the book suggests further reading. An index and a bibliography are also included. A particular strength of *Super Crocs* is its presentation of how paleontologists work: carefully observing modern animal anatomy and behavior, thoroughly comparing this with fossil evidence, and thoughtfully coming to conclusions.

*Adaptation* (ages 11 to 14), part of a 10-book series called Science Concepts, is an excellent, straightforward text that presents adaptations to a variety of conditions: extreme habitat, seasonal

change, predator-prey interactions, and nocturnal life. The solid writing and skillful presentation allow readers to absorb numerous and fascinating aspects of the topic. It is also pleasing to see plant adaptations discussed as well as the more "exciting" animal adaptations. This book by the Silversteins is another valuable reference for a child's science book collection.

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Children's books about evolution would not be complete without a title about dinosaurs. *Stones and Bones* (ages 4 to 8), by Char Matejovsky, is appealing to both the eyes and the ears of younger readers. Its text is geological history told in rhyme, and each page visually presents significant events in geologic history and evolution as items in Darwin's library. The reader finds a list of dinosaur names, a time line of evolution, and the scientific classification of man spelled out on lettered building blocks. These illustrations are charming, but without further information from a parent or a teacher, they can become an unexplained display of facts. To add to the appeal, the book is accompanied by a compact disc of the "Stones and Bones" song, performed by the Santa Rosa Children's Chorus. It is a gentle rendition of the book's text.

Evolution, adaptation, and the history of Earth are well represented in this collection of children books. There is much to choose from; all of these books are cleverly executed, reader-friendly, and beautiful in their visual presentations and their depth of focus. A common theme runs through these titles, one of encouraging children, as young scientists, to practice careful observation and to thoughtfully consider organisms both living and dead, each being an essential part of the evolutionary journey of the natural world.

I cannot end without mentioning 2003's *The Tree of Life* by Peter Sis, a beautifully illustrated biography of Charles Darwin that discusses his public life, his private life, and the development of his scientific ideas. This book would be a wonderful way for any child to start learning about this great figure of biology. (I use it as a reference with my 11th and 12th grade students in advanced placement biology.)



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