

The Field Museum
Education Department Presents

Evolving Planet Educator Guide First Edition: Spring 2006



Opening March 10, 2006

EXPLORE THE HISTORY OF LIFE

Travel back through time to learn how evolution
has created the mosaic of life on Earth.

PART TWO

Related Programs, Exhibitions, and Resources



Evolving Planet

Opening March 10

This educator guide is separated into four parts: content, teacher and student resources, fun facts, and a walking map. The content for *Evolving Planet* consists of 12 sections. Before you visit the exhibition, spend some time viewing the information on the Museum's Web site at www.fieldmuseum.org/evolving-planet to begin planning your visit. We recommend using some of our quick fun facts and pre-activities to introduce your students to the geologic timeline, which is a reference tool that is prominent throughout the exhibition. Each section of this guide has an introduction, guiding questions, pre-activities, field trip activities, post-activities, and answers to guiding questions to help guide your students' experience.



Illustrations by Karen Carr, © The Field Museum

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Teacher contributors: Michael Baker, Bernadette Barnett and Nicholas Guerrero

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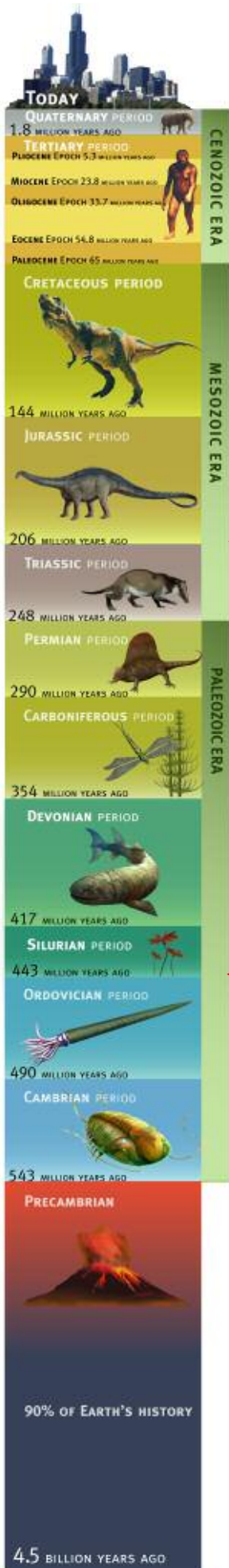
In accordance with Title IX of the Education Amendments Act of 1972, we do not discriminate on the basis of sex in our programs or activities. Please call 312.665.7271 to contact our Title IX Coordinator should you have questions or concerns.

Citigroup Foundation provides lead corporate support for professional development programs for teachers at The Field Museum.

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THE GEOLOGIC TIME SCALE



Sixth Mass Extinction

Fifth Mass Extinction

Fourth Mass Extinction

Third Mass Extinction

Second Mass Extinction

First Mass Extinction

Sections:

Part One:

Introduction to *Evolving Planet*

Section 1

Orientation to *Evolving Planet*

Section 2

The Precambrian: Life Emerges

Section 3

The Cambrian and Ordovician:
World of Water

Section 4

The Silurian and Devonian:
From Fins to Limbs

Section 5

The Carboniferous: Age of Coal Forests

Section 6

The Permian: Patchwork of Pangaea

Section 7

The Triassic: Dawn of a New Era

Section 8

The Jurassic and Cretaceous:
Age of the Dinosaurs

Section 9

The Tertiary: Age of the Mammals

Section 10

The Hominids: Dawn of Humankind

Section 11

The Quaternary: Age of Ice

Part Two:

Related Programs, Exhibitions,
and Resources

Part Three:

Walking Map

PART TWO: Teacher and Student Resources



Planning a field trip to the Museum? Download and print our field trip registration form (www.fieldmuseum.org/education/registration.htm). And be sure to register your students for one of these exciting opportunities during your visit.

Just for Students!

Engage your students with these hands-on classes that include a guided tour of the exhibition as well as laboratory activities. Call 312.665.7500 or go to www.fieldmuseum.org/education for more information, schedules, and prices.

Footprints of the Past (Grades 1–4)

Explore the fascinating creatures that inhabited the Earth at the dawn of time, and compare them to today's animal kingdom.

Free with field trip registration

The Life of Earth (Grades 5–7)

Travel back through the history of our amazing planet and understand how it has evolved into the planet we inhabit today.

Free with field trip registration

The Great Fossil Hunt (Grades 3–8)

Find out what it takes to be a paleontologist! Learn about the process of fossilization as you unearth and prepare dinosaur bones for display, and discover what fossils can tell us about the past.

Free with field trip registration

Inherit the Wind (Grades 8–12)

Witness a live performance of this famous play by Jerome Lawrence and Robert E. Lee, produced by Bernie Sahlins. *Inherit the Wind* is a fascinating interpretation of the famous 1925 trial that outlawed teaching of evolution in Tennessee public schools.

Friday, March 17, 2006, 11am-noon

\$3 per Chicago student, \$4 per student outside of Chicago

Just for Teachers !

Earn CPDUs, Lane and Graduate Credit with our *Evolving Planet* teacher workshops. Check our Web site at www.fieldmuseum.org/evolvingplanet for dates, times, and details. Register by calling 312.665.7500.

Evolving Planet: Educator Preview

Be the one of the first to explore the new exhibition, and see how it reflects new discoveries in our understanding of evolution. You'll see ancient fossils, early hominids, and an expanded hall of dinosaurs as you discover ways to link to the Illinois Learning Standards and develop field trip and classroom activities.

Saturday, March 25, 2006, 9am-noon

\$40, members \$35

Evolution, Biodiversity, and Adaptations

Visit the new *Evolving Planet* exhibition and explore linkages to Illinois Learning Standards while developing focused field trip activities. You'll discuss concepts of evolution, biodiversity, and adaptations that explore the scientific method using Field Museum research and Harris Educational Loan resources. Earn 3 CPDUs.

Wednesday, April 4, 5–8pm

\$40, members \$35

Teacher and Student Resources (*continued...*)



Exploring Ancient Life: Fossils in the Classroom

Learn about best practices in teaching evolution during this three-day expedition. You'll get a guided of *Evolving Planet*, a behind-the-scenes collections tour, then get to practice your own fossil collecting at Mazon Creek! Earn 15 CPDUs. 1 Lane Credit and 1 Aurora Graduate Credit are also available for those who attend the March 25 Educator Preview.

Thursday, April 27, 5–8pm

Saturday, April 29, 9am–4pm (at Mazon Creek)

Tuesday, May 2, 5–8pm

\$225, members \$200

Breakfast and/or Boxed Dinners and field trip transportation provided.

Related Museum Exhibitions

Temporary Exhibitions

Dinosaur Dynasty: Discoveries from China (May 27, 2005 – April 23, 2006)

Jungles (May 27, 2005 – March 5, 2006)

Pompeii: Stories from an Eruption (October 22, 2005 – March 26, 2006)

Gregor Mendel: Planting the Seeds of Genetics (September 15, 2006 – April 1, 2007)

Dinosaurs: Ancient Fossils, New Discoveries (March 30 – September 3, 2007)

Darwin (June 15, 2007 – January 1, 2008)

Permanent Exhibitions

Africa

Bird Habitats

Lions of Tsavo

Mammals of Asia

Messages from the Wilderness

Plants of the World

Sea Mammals

What is an Animal?

World of Mammals

Grainger Gallery

Hall of Jades

Moving Earth

Animal Biology

Bushman

Mammals of Africa

Man-eater of Mfuwe

Nature Walk

Reptiles and Amphibians

Underground Adventure

World of Birds

Earth Sciences

Grainger Hall of Gems

McDonald's Fossil Preparation Laboratory

Traveling the Pacific



Relevant Harris Loan Education Center Materials

Reserve these materials for use in your classroom by visiting www.fieldmuseum.org/harrisloan or call 312.665.7555 for schedules, and prices.

Exhibit Cases

General Geology

- Interior of the Earth
- Pebbles: How Shaped by Erosion
- Igneous Rocks

Paleontology

- Fossil Plants of Illinois
- Fossils from Rocks near Chicago
- Dinosaur Eggs
- Great Horned Dinosaur, *Triceratops*
- SUE Skull and Stand (traveling exhibit skull)

Experience Boxes

General Geology

- Mineral Match
- Shake, Rumble and Roll
- Rocks and Minerals
- Geology of Illinois
- Africa: The Land

Paleontology

- 300 Million Years Ago in Illinois
- Fossils from Fossil Lake
- The *T. rex* Named Sue
- Dinosaurs and Other Mesozoic Creatures
- Dinosaurs and Their Times: Jurassic
- Dinosaurs and Their Times: Cretaceous
- Dinosaur Dinners
- Ice Age Mammals of Chicago
- Hominid Evolution



Online Resources

Evolution

1. <http://evolution.berkeley.edu/> (Understanding Evolution)
2. www.pbs.org/wgbh/evolution/ (PBS Evolution)
3. www.evotutor.org/ (Evotutor; evolution animations)
4. www.ncseweb.org/default.asp (National Center for Science Education)
5. <http://evonet.sdsc.edu/evoscisociety/short/biologys1.htm> (Evolution, Science and Society)
6. www.aaas.org/spp/dser/evolution/ (American Association for the Advancement of Science)
7. www.actionbioscience.org/evolution/index.html (American Institute of Biological Sciences)
8. <http://bob.nap.edu/html/evolution98/contents.html> (Teaching about Evolution and the Nature of Science publication)
9. www.bbc.co.uk/education/darwin/index.shtml (BBC Evolution Web site)
10. www.origins.tv/darwin/eyes.htm (Darwinians and Evolution; Linnaean Society)
11. www.agiweb.org/news/evolution/ (AGI Evolution and the Fossil Record)
12. www.talkorigins.org/ (The Talk Origins Archive)
13. www.talkdesign.org/ (Talkdesigns.org)
14. <http://library.thinkquest.org/C004367/ef3.shtml?tqskip1=1> (Evolution, Religion and Creationism)
15. www.indiana.edu/~ensiweb/home.html (Evolution and the Nature of Science Institutes)
16. <http://nsm1.nsm.iup.edu/rgendron/EvolutionOnTheWeb.shtml> (Evolution on the Web for Biology Students)
17. <http://tolweb.org/tree/phylogeny.html> (Tree of Life)
18. www.all-species.org/ (All Species Foundation)
19. www.becominghuman.org/ (Institute of Human Origins)
20. <http://aleph0.clarku.edu/~djoyce/java/Phyltree/cover.html> (Phylogeny and Reconstructing Phylogenetic Trees)
21. www.literature.org/authors/darwin-charles/ (Darwin books downloads)
22. <http://evol.allenpress.com/evolonline/?request=index-html> (Evolution; International Journal of Organic Evolution)
23. www.ucmp.berkeley.edu/clad/clad4.html (UCMP Berkeley's Phylogenetics site)
24. www.law.umkc.edu/faculty/projects/ftrials/scopes/scopes.htm (Scopes trial)
25. <http://pubs.usgs.gov/gip/geotime/radiometric.html> (USGS time scale and dating)
26. www.accessexcellence.org/WN/NM/miller.html (interview with Dr. Stanley Miller)



Online Resources

Paleontology – Museums

Notes:

1.	www.mnh.si.edu/ (National Museum of Natural History)	
2.	www.amnh.org/ (American Museum of Natural History)	
3.	www.ucmp.berkeley.edu/ (University of California Museum of Paleontology)	
4.	www.dmns.org/main/en/ (Denver Museum of Nature and Science)	
5.	www.carnegiemnh.org/ (Carnegie Museum of Natural History)	
6.	www.mcz.harvard.edu/ (Museum of Comparative Zoology, Harvard)	
7.	www.peabody.yale.edu/ (Peabody Museum of Natural History, Yale)	
8.	www.acnatsci.org/ (The Academy of Natural Sciences)	
9.	www.tarpits.org/ (The Page Museum)	
10..	www.lacma.org/ (Los Angeles County Museum of Art)	
11.	www.childrensmuseum.org/ (The Children’s Museum of Indianapolis)	
12.	www.burpee.org/ (Burpee Museum of Natural History)	
13.	www.priweb.org/museumoftheearth/ (Museum of the Earth)	
14.	www.uwyo.edu/geomuseum/ (University of Wyoming Geological Museum)	
15.	http://museum.ceu.edu/ (College of Eastern Utah Prehistoric Museum)	
16.	www.wmnh.com/wmhome.htm (The Worldwide Museum of Natural History)	
17.	www.cc.whecn.edu/tate/main.htm (Tate Geological Museum)	
18.	www.alfmuseum.org/ (Raymond M. Alf Museum of Paleontology)	
19.	www.snomnh.ou.edu/ (The Sam Noble Museum of Natural History)	
20.	www.montana.edu/wwwmor/ (The Museum of the Rockies)	
21.	www.washington.edu/burkemuseum/ (The Burke Museum of Natural History and Culture)	
22.	hwww.nature.ca/nature_e.cfm (Canadian Museum of Nature)	
23.	www.tyrrellmuseum.com/ (The Royal Tyrrell Museum)	
24.	www.rom.on.ca/ (Royal Ontario Museum)	
25.	www.manitobamuseum.mb.ca/home.html (The Manitoba Museum)	
26.	www.museum.vic.gov.au/ (Museum Victoria)	
27.	http://museum.gov.ns.ca/fgm/ (Fundy Geological Museum, Nova Scotia)	
28.	www.nhm.ac.uk/ (Natural History Museum, UK)	
29.	www.hunterian.gla.ac.uk/index.html (The Hunterian Museum)	
30.	www.nhmmaastricht.nl/engels/enquete.htm (Natuurhistorisch Museum Maastricht)	



Books for Teachers

- Alters, Brian J., and Sandra M. Alters. 2003.
Defending Evolution: A Guide to the Creation/Evolution Controversy.
Jones and Bartlett, Boston, MA.
- Bowler, Peter J. 2003.
Evolution: The History of an Idea.
University of California Press, Berkeley, CA.
- Futuyma, Douglas J. 1995.
Science on Trial: The Case for Evolution. 2nd edition.
Sinauer Associates, Sunderland, MA.
- Kelley, Patricia H., Jonathan R. Bryan, and Thor A. Hansen, editors. 1999.
The Evolution Creation Controversy II: Perspectives on Science, Religion, and Geological Education.
The Paleontological Society Papers, volume 5, The Paleontological Society.
- Lawson, Kristan. 2003.
Darwin and Evolution for Kids: Life and Ideas with 21 Activities.
Chicago Review Press, Chicago, IL.
- Park, Robert L. 2000.
Voodoo Science: The Road from Foolishness to Fraud.
Oxford University Press, New York, NY.
- Marks, Jonathan. 2002.
What it Means to be 98% Chimpanzee: Apes, People, and Their Genes.
University of California Press, Berkeley, CA.
- Mayer, Ernst.
What Evolution Is. 2001.
Basic Books, New York, NY.
- National Academy of Sciences. 1999.
Science and Creationism. A View from the National Academy of Sciences. Second Edition.
National Academy Press, Washington, DC.
- National Academy of Sciences. 1998.
Teaching about Evolution and the Nature of Science.
National Academy Press, Washington, DC.
- Pennock, Robert T. 1999.
Tower of Babel: The Evidence Against the New Creationism.
MIT Press, Cambridge, MA.
- Pojeta, John, Jr., and Dale Springer. 2001.
Evolution and the Fossil Record.
American Geological Institute, Alexandria, VA.
- Sagan, Carl. 1996.
The Demon-Haunted World: Science as a Candle in the Dark.
Ballantine Books, New York, NY.
- Scotchmoor, J., Breithaupt, B., Springer, D. and A. Fiorillo. 2002.
Dinosaurs: The Science behind the Stories.
American Geological Institute, Alexandria, VA.
- Scott, Eugenie C. 2004.
Evolution vs. Creationism: An Introduction.
University of California Press, Berkeley, CA.



Books for Students

- DK Eyewitness Books. 2004.
Dinosaur.
Dorling Kindersley. New York, NY.
- Gamlin, Linda. 2000.
Eyewitness Evolution.
Dorling Kindersley. New York, NY.
- Jackson, Ellen. 1993.
The Tree of Life: The Wonders of Evolution.
Prometheus Books. Ages 9-12
- Jenkins, Steve. 2002.
Life on Earth: The Story of Evolution.
Houghton Mifflin Co., New York, NY.
- Lawson, Kristan. 2003.
Darwin and Evolution for Kids: Life and Ideas with 21 Activities.
Chicago Review Press, Chicago, IL.
- Lindsay, William. 2000.
Eyewitness Prehistoric Life.
Dorling Kindersley. New York, NY.
- McNulty, Faith. 1999.
How Whales Walked into the Sea.
Scholastic Press. New York, NY.
- Osborne, Mary Pope, and Natalie Pope Boyce.
Sabertooths and the Ice Age.
Stepping Stone Book: New York, NY.
- Parsons, Jayne.
Dinosaur Encyclopedia. 2001.
National Academy Press, Washington, DC.
- Peters, Lisa Westberg and Lauren Stringer. 2003.
Our Family Tree: An Evolution Story.
Harcourt Inc., Orlando, FL.
- Sloan, Christopher, Leakey, Meave and Louise Leakey. 2004.
The Human Story: Our Evolution from Prehistoric Ancestors to Today.
National Geographic Society.
- Stein, Sara.
The Evolution Book. 1986.
Houghton Mifflin Co., New York, NY.
- Zihlman, Adreinne. 2000.
The Human Evolution Coloring Book.
Harper Collins Publishers Inc., New York, NY.
- Zimmerman, Howard. 2001.
Beyond the Dinosaurs: Sky Dragons, Sea Monsters, Mega-mammals and Other Prehistoric Beasts.
Antheneum Press. New York, NY.
- Zimmerman, Howard. 2000.
Dinosaurs: The Biggest, Baddest, Strangest and Fastest.
Antheneum Press. New York, NY.