Cambridge Core Science Series: GeoBasics

OCEANS AND SEAS

Cambridge Educational

Introduction

This Teacher's Guide provides information to help you get the most out of *Oceans and Seas,* Part 4 of the *GeoBasics* series. The contents in this guide will allow you to prepare your students before they use the program, assist them as they navigate through the program, and present follow-up activities to reinforce the program's key learning points.

The *GeoBasics* series is intended to excite young people about science and teach them concepts that meet national educational standards for science literacy. Science, in its multiple disciplines, is inherently fascinating and helps explain the world around us. In addition to fulfilling our natural curiosity, studying science and learning critical thinking skills provides numerous practical benefits, including helping us make informed and reasoned decisions, solve problems, think creatively, and continue to learn.

This 20-minute video provides students in grades 7 through 12 with an overview of our oceans, from the bottom-most seafloor to the surface waves, and discusses the impact of the oceans on our lives and our land. Because science literacy is important for all people, the information presented in *Oceans and Seas* could also be presented to vocational / technical schools or in adult education courses that focus on science and health.

Learning Objectives

After watching *Oceans and Seas*, students will understand how to:

- Demonstrate an understanding of the importance of oceans to humans, the marine food chain, and the planet Earth.
- Explain the various kinds of ocean currents and the forces that influence them.
- Describe the features of the seafloor, from landforms to animal life.
- Demonstrate an understanding of tides and waves—what they are, what causes them, and how they are classified.
- Provide examples of how coasts bear the marks of the sea, and explain how coasts are formed and how they change over time.
- Provide a basic explanation of how oceans have been affected by human activity.

Educational Standards

The *Oceans and Seas* video program correlates with the following Standards: the National Standards of the National Academy of Sciences National Science Education, International Society for Technology in Education (ISTE), National Educational Technology Standards (NETS), and National Council of Teachers of English; and the State Standards of Florida, Ohio, and Texas for Earth and Space Sciences; Biology; Processes that Shape the Earth; How Living Things Interact with their Environment; and Listening, Viewing, and Speaking.

- Develops an understanding of energy in the earth system, geochemical cycles, origin and evolution of the earth system, and origin and evolution of the universe. *(National Academy of Sciences National Science Education Standards, Earth and Space Science Standards: Grades 9-12)*

- Conducts research on issues and interests by generating ideas and questions, and by posing problems; gathers, evaluates, and synthesizes data from a variety of sources (e.g., print and non-print texts, artifacts, people) to communicate their discoveries in ways that suit their purpose and audience; uses a variety of technological and information resources (e.g., libraries, databases, computer networks, video) to gather and synthesize information and to create and communicate knowledge. *(International Society for Technology in Education [ISTE] National Educational Technology Standards [NETS])*

- Uses spoken, written, and visual language to accomplish their own purposes (e.g., for learning, enjoyment, persuasion, and the exchange of information). *(National Council of Teachers of English Standards for the English Language Arts)*

- Recognizes that processes in the lithosphere, atmosphere, hydrosphere, and biosphere interact to shape the Earth; understands the need for protection of the natural systems on Earth; understands the competitive, interdependent, cyclic nature of living things in the environment; and understands the consequences of using limited natural resources; uses listening strategies effectively; and uses viewing strategies effectively. *(Florida State Standards: Processes that Shape the Earth; How Living Things Interact with their Environment; Listening, Viewing, and Speaking)*

- Earth-based and space-based astronomy reveal the structure, scale, and changes in stars, galaxies, and the universe over time. Plate tectonics operating over geologic time has changed the patterns of land, sea, and mountains on Earth's surface. Energy enters the Earth system primarily as solar radiation and eventually escapes as heat. Heating of Earth's surface and atmosphere by the sun drives convection within the atmosphere and oceans, producing winds and ocean currents. Climate is the long-term average of a region's weather and depends on many factors. *(California State Earth Sciences Standards)*

- Demonstrates an understanding about how earth systems and processes interact in the geosphere resulting in the habitability of Earth. This includes demonstrating an understanding of the composition of the universe, the solar system, and Earth. In addition, it includes understanding the properties and the interconnected nature of Earth's systems, process that shape Earth and Earth's history. *(Ohio State Earth and Space Science Standards)*

- Demonstrates an understanding of how concepts and principles of energy, matter, motion, and forces explain Earth systems, the solar system, and the universe. *(Ohio State Earth and Space Science Standards)*

- Defines and investigates self-selected or assigned issues, topics and problems; locates, selects and makes use of relevant information from a variety of media, reference and technological sources; uses an appropriate form to communicate their findings. *(Ohio State Earth and Space Science Standards)*

- Knows that interdependence and interactions occur within an ecosystem; knows the significance of plants in the environment; understands and interprets visual representations; analyzes and critiques the significance of visual representations; listens attentively for a variety of purposes; recognizes/interprets visual representations as they apply to visual media. *(Texas State Biology and English I, II, III, and IV Standards)*

- Understands and applies scientific concepts, principles, and theories pertaining to the physical setting and living environment and recognizes the historical development of ideas in science. *(New York State Earth Science, Language for Information and Understanding, and Language for Social Interaction Standards)*

- Understands the fundamental concepts, principles, and interconnections of the life physical, and earth/space sciences; listens and speaks effectively in a variety of situations. *(Illinois State Concepts and Principles, Listening and Speaking Standards)*

Program Overview

The *Cambridge Core Science* series is a 40-part series composed of subsets of programs addressing Life Science, Earth Science, Physical Science, Human Body Systems, and Space Science. The series is designed as a whole to give high school and some college students a basic scientific understanding of themselves and the world around them.

The *GeoBasics* video program series consists of eight titles:

- Our Planet Earth
- Plate Tectonics
- Rocks and Minerals
- Oceans and Seas
- Geocycles
- Atmosphere, Climate, and Weather
- Energy and Resources
- Environmental Issues and Human Impact

The fourth title in the series, *Oceans and Seas,* provides an overview of our oceans from the bottom-most seafloor to the surface waves, and discusses the impact of the oceans on our lives and our land.

Main Topics

Topic 1: Introduction
The program begins by introducing Earth, the "Water Planet," and how water, in its many forms of lakes, rivers, oceans, and seas, makes life possible.

Topic 2: Earth's Water
The program continues by taking a look at theories on the origins of water on Earth and the major oceans that have changed over geologic time. Experts explain the water cycle and the importance of oceanography and the marine sciences in investigating oceans and the geology of the ocean floor.

Topic 3: Oceans
In this section, students are presented with an in-depth exploration of our great oceans, with focus on ocean basins, oceanic crust, plate tectonics, the continental shelf, slope and rise, the abyssal plains, mid-ocean ridges, and coastlines.

Topic 4: Waves, Tides, and Currents
The section begins with waves, explaining what waves are, how tsunamis are created, the parts of a wave, and how waves are described. Next, the various types of tides are explored. Finally, surface and return currents, deep currents, determining factors affecting currents, and the causes of El Niño and La Niña are presented in vivid detail.

Topic 5: Conclusion
From pollution and overfishing, to rising temperatures linked to increased CO_2 emissions and global warming, the planet's oceans are greatly affected by human activity. The program concludes with information on our negative impact on the oceans, but also details the positive impact we can have through understanding biology, ecology, urban planning, and oceanography, and the interdependencies between life, the oceans, and Earth's atmosphere.

Fast Facts

- Approximately two-thirds of the Earth's surface is covered with water. Earth is the only planet on which water can exist in liquid form on the surface (although there may be liquid ethane or methane on Titan's surface and liquid water beneath the surface of Europa).

- The Somali current off Africa's eastern coast is unusual because it reverses direction twice a year. From May to September it runs north; from November to March it runs south. As it flows northward, upwelling supports productive marine life, but productivity falls when the current begins to move southward.

- There are two high tides and two low tides each day. Because of the angle of the moon with respect to the Earth, the two high tides each day do not have to be of equal height, nor do the two low tides each day. Tides also differ in height on a daily basis, due to the changing distance between the Earth and the moon.

- Waves can be described by their height, length, and wave period. During storms, wave heights increase and can exceed 33 feet, but the wave length during storms tends to decrease to as small as 50 feet.

- Glaciers are smaller and the climate is warmer now than 10,000 years ago. Much of the coastline formerly emergent is now submerged. If Earth's average temperature keeps going up, the oceans will continue to rise.

- There are many sources of pollution in our waters. In addition to point sources such as sewage and industrial waste, a great deal of water pollution comes from non-point sources such as agricultural runoff and stormwater drainage. Common water pollutants include pesticides, lead, arsenic, and polychlorinated biphenyls (PCBs).

- States have identified farm runoff as a source of pollution of more than 100,000 river miles (1/3 of those sampled), half of the country's lakes, and 40% of America's estuaries. In some states, polluted runoff from farms accounts for more than 90% of river pollution. Overall, the percentage of rivers that cannot fully support aquatic life or are unsafe for fishing and swimming grew from 26% in 1984 to 36% in 1996.

- New England's economically valuable fish populations teeter on the brink of commercial extinction. And in Canada, local culture and traditions are vanishing as the country is forced to close down fisheries and leave fishing villages abandoned.

Vocabulary Terms

abyssal plains: Flat or very gently sloping areas of the deep ocean basin floor. They are among the Earth's flattest and smoothest regions, and the least explored. Abyssal plains cover approximately 40% of the ocean floor and reach depths of between 7,200 and 18,000 feet. They generally lie between the foot of a continental rise and a mid-ocean ridge.

atmosphere: The gaseous mass or envelope surrounding the Earth and retained by the Earth's gravitational field.

biosphere: The part of the Earth and its atmosphere in which living organisms exist or which is capable of supporting life.

climate: The meteorological conditions, including temperature, precipitation, and wind, that characteristically prevail in a particular region.

continental drift: The movement, formation, or re-formation of continents described by the theory of plate tectonics.

continental margin: The offshore zone, consisting of the continental rise, shelf, and slope that separates the land of a continent from the deep ocean floor; the ocean floor from the continental slope to the abyssal plain.

continental rise: A gentle slope with a generally smooth surface, rising from the deep ocean floor toward the foot of the continental slope.

continental shelf: The extended perimeter of each continent, which is covered during interglacial periods such as the current epoch by relatively shallow seas (known as shelf seas) and gulfs. The shelf usually ends at a point of increasing slope (called the shelf break).

continental slope: The sea floor below the shelf break.

convection: The process that transmits heat by transporting groups of molecules from place to place within a substance such as water or air.

convergent (destructive) boundary: The boundary where a dense oceanic plate collides with a less-dense continental plate, causing the oceanic plate typically to be thrust underneath, forming a subduction zone.

crest: The top part of a wave. A ridge or swell moving through or along the surface of a large body of water.

current: A steady flow of water.

deep currents: A series of currents in the deep ocean.

diurnal tide: A tide that rises and falls twice each tidal day (24 hours, 50 minutes). It has one high tide and one low tide.

divergent (constructive) boundary: Where two plates move apart from each other. The space that this creates is filled with new crustal material sourced from molten magma that forms below.

earthquake: A sudden movement of the Earth's crust caused by the release of stress accumulated along geologic faults or by volcanic activity.

El Niño: Warming of the ocean surface off the western coast of South America that occurs every 4 to 12 years when upwelling of cold, nutrient-rich water does not occur. It causes die-offs of plankton and fish and affects Pacific jet stream winds, altering storm tracks and creating unusual weather patterns in various parts of the world.

flood: An overflowing of water onto land that is normally dry.

geocycle: Processes on Earth that move and recycle matter.

geology: The scientific study of the origin, history, and structure of the Earth.

geothermal energy: A form of energy obtained from within the Earth, originating in its core; also, energy produced by extracting the Earth's internal heat.

glacier: A large, long-lasting river of ice that is formed on land and moves in response to gravity. A glacier is formed by multi-year ice accretion in sloping terrain.

global warming: An increase in the average temperature of the Earth's atmosphere, especially a sustained increase sufficient to cause climatic change.

gyre: A circular or spiral motion, especially a circular ocean current.

hydrologic cycle (a.k.a., the water cycle): The cycle of evaporation and condensation that controls the distribution of the Earth's water as it evaporates from bodies of water, condenses, precipitates, and returns to those bodies of water.

hydrosphere: The watery layer of the Earth's surface; includes water vapor.

La Niña: A cooling of the ocean surface off the western coast of South America, occurring periodically every 4 to 12 years and affecting Pacific and other weather patterns.

magma: The molten rock material under the Earth's crust, from which igneous rock is formed by cooling.

mid-ocean ridge: A series of mountain ranges on the ocean floor, more than 52,000 miles in length, extending through the North and South Atlantic, the Indian Ocean, and the South Pacific. According to the plate tectonics theory, volcanic rock is added to the seafloor as the mid-ocean ridge spreads apart.

mixed tides: Two high tides and two low tides per day that are of unequal height.

neap tides: Especially weak high tides occurring twice a month during the quarter moon, when the sun and moon are pulling at right angles to one another.

ocean (oceanic) basin: Anywhere on Earth that is covered by seawater. The oceanic basins are the complement to the continents; erosion dominates the latter, and the sediments so derived end up in the ocean basin.

oceanic crust: The part of Earth's lithosphere which underlies the ocean basins. It is thinner but more dense than continental crust, and is composed of mafic basaltic rocks. Most of the present-day oceanic crust is less than 200 million years old because it is continuously being created at oceanic ridges and destroyed by being pulled back into the mantle by the processes of plate tectonics.

plate tectonics: A theory that explains the global distribution of geological phenomena such as seismicity, volcanism, continental drift, and mountain building in terms of the formation, destruction, movement, and interaction of the Earth's lithospheric plates.

semi-diurnal tides: A tide that rises and falls four times each tidal day (24 hours, 50 minutes). It has two high tides and two low tides of equal height.

Southern Ocean: The body of water encircling the continent of Antarctica, according to some geographic and most hydrographic sources. It is the world's fourth-largest ocean and the latest defined, having been accepted by a decision of the International Hydrographic Organization (IHO) in 2000, though the term has long been traditional among mariners.

spring tides: Extreme high and low tides created when the sun are moon are aligned twice a month, during the full and new moons.

subduction: A geologic process in which the edge of one crustal plate is forced below the edge of another.

surface currents: Currents on the ocean’s surface that are generally wind-driven and develop their typical clockwise spirals in the northern hemisphere and counter-clockwise rotation in the southern hemisphere due to the imposed wind stresses.

tectonic plate: A piece of the Earth's crust and uppermost mantle that moves, floats, and sometimes fractures and whose interaction with other plates causes earthquakes, volcanoes, mountains, and oceanic trenches.

topography: Surface features of a place or region, including their relative positions and elevations.

transform (conservative) boundary: Where tectonic plates slide and grind against each other along a transform fault in a horizontal motion.

trough: The bottom of a wave.

tsunami: A very large ocean wave caused by an underwater earthquake or volcanic eruption.

volcano: An opening in the Earth's crust through which molten lava, ash, and gases are ejected or a mountain formed by the materials ejected from a volcano.

water table: The level below which the ground is completely saturated with water. Also called *water level.*

wave: The progression of energy from one point to another.

wave height: The vertical distance from the crest to the trough.

wave length: The horizontal length between the crest of one wave and the crest of the successive wave.

wave period: The time it takes for two successive waves to pass a fixed point.

wave velocity: The speed at which the waves are moving.

Pre-Program Discussion Questions

1. How much do you know about the planet's oceans? Identify them in relation to the world's continents.

2. How did the world's oceans form?

3. Have you ever been to the beach? Describe what you think causes tides, currents, and waves.

4. Discuss the December 26, 2004 Asian Tsunami, what caused it, and the resulting damaging effects.

5. Can you identify what El Niño and La Niña are, what causes them, and how they differ?

Post-Program Discussion Questions

1. Describe the water cycle in relation to the Earth's oceans and seas.

2. Draw a few waves on the whiteboard or chalkboard and identify the various elements that describe the waves.

3. Identify and discuss the various types of tides that exist.

4. What are the determining factors that affect currents?

5. Even if you live in the desert, you can see evidence of the impact of humans on Earth's oceans and seas. In what ways do you see the effects?

Internet Activities

- Using the Internet, locate one community on the east coast and another on the west coast that provide daily or weekly data regarding tides. Create a chart of the past month's tides and write about both the similarities and differences in the tides, as well as the underlying causes for the differences.

- What sciences are involved with exploring or researching our planet's waters? Write a paper of 5-7 pages in length detailing the various sciences, and describe some innovations or discoveries that have been made in recent years. What explorations are left to be made in the future?

Group Activities

- Divide the class into groups and assign each group a type of tide: spring, neap, diurnal, semi-diurnal, or mixed. Ask each group to research and then present an explanation of the tide, its causes, and its effects.

- Divide the class into three groups and have each group discuss one type of current: surface, deep, or return. Using the whiteboard or chalkboard, have each group explain and draw the current's movement. If possible, try to locate 3D graphic animations from the Internet to better depict the movement and causes.

Individual Student Projects

- Ask each student to create a project that details how a wave works, how it is described, and how it is affected by wind, underwater earthquakes, etc. The student should feel free to express these findings through any of the following: a research paper; a large, detailed and labeled poster; or a PowerPoint or interactive multimedia presentation.

- Have students research and write a paper on the 2004 Asian Tsunami. What caused it (include information on tectonic plates), and what were its effects? How have the affected regions changed as a result?

Assessment Questions

Q1: What do some scientists call the waters around Antarctica?
A: The Southern Ocean.

Q2: What do oceanographers and marine scientists study?
A: Among other things, they study marine life, waves, currents and tides, the effects of oceans on the climate, and the geology of the ocean floor.

Q3: The type of tide that has two high tides and two low tides per day of unequal height is called _____.
a) neap
b) diurnal
c) semi-diurnal
d) mixed
A: d.

Q4: What are the main subdivisions of continental margins?
A: The continental shelf, the continental slope, and the continental rise.

Q5: What are the abyssal plains?
A: Flat or very gently sloping areas of the deep ocean basin floor. They are among the Earth's flattest and smoothest regions, and the least explored. Abyssal plains cover approximately 40% of the ocean floor and generally lie between the foot of a continental rise and a mid-ocean ridge.

Q6: The type of tide that has two high tides and two low tides per day of the same height is called _____.

a) neap
b) diurnal
c) semi-diurnal
d) mixed

A: c.

Q7: When do spring tides occur?

a) In the spring.
b) Twice a month, regardless of the state of the moon.
c) Twice a month during the full and new moons.
d) Twice a month during the quarter moons when the sun and moon are perpendicular to each other.

A: c.

Q8: What determining factors affect ocean currents?
A: Heating, cooling, the amount of salt, the amount of wind, and the motions of the Earth's atmosphere all drive ocean currents.

Q9: What controlling factors cause coastlines to change over time?
A: Coastlines change over time depending on controlling factors such as what rivers are depositing what kinds of material, the orientation of the coast in relation to wave systems, whether the coast is tectonically active, and what kinds of rock are present at the coastline.

Additional Resources

USGS Education: Science for a Changing World
www.usgs.gov/education

Educypedia: The Educational Encyclopedia
http://users.pandora.be/educypedia/education/geology.htm

NASA's Science Mission Directorate Website
http://science.hq.nasa.gov

The Center for International Earth Science Information Network (CIESIN)
www.ciesin.org

The Earth Institute at Columbia University
www.earthinstitute.columbia.edu

The WWW Virtual Library: Earth Science
http://vlib.org/EarthScience

Earth Science Week
www.earthsciweek.org

National Earth Science Teachers Association
www.nestanet.org

Additional Resources at www.filmsmediagroup.com

Available from Films Media Group • www.filmsmediagroup.com • 1-800-257-5126

Earth Science I Video Library

- **VHS #30977**
- **VHS #30992—in Spanish**
- **DVD #30962**
- **Closed captioned**
- **Correlates to National Science Education Standards**
- **Includes a User's Guide**

Contains 18 video clips on the history of the Earth, fossils, paleontology, and mapping the Earth. Clips include *Introduction to Earth History, Thermal Features, Blue Hole, Extinction, Glaciers, Fossil Hunter, Fossil Voyage, Amber, Mammoth, Rhino Fossils, Fossil Tunnels, Early Maps, Remote Sensing, Global Positioning System, Mountains, Seafloor Maps, Measuring Latitude, Measuring Longitude*. A User's Guide is included, containing an overview; a numbered index of clips, with brief descriptions and lengths; time codes (VHS only); suggested instructional strategies; and a list of additional resources. A Discovery Channel/FFH&S Production. © 2003.

Earth Science II Video Library

- **VHS #30978**
- **VHS #30993—in Spanish**
- **DVD #30963**
- **Closed captioned**
- **Correlates to National Science Education Standards**
- **Includes a User's Guide**

The *Earth Science II Video Library* contains 24 video clips on volcanoes, earthquakes, oceans, seasons, weather, and climate. Clips include *Introduction to Volcanoes, Birth of a Volcano, Death and Destruction, Types of Volcanoes, Volcanology, Plate Tectonics, Earth in Motion, San Andreas Fault, Seismology, Earthquake-Proof, Earthquake Zone, Introduction to Oceans, Coral Reefs, Waves and Tides, Fish Harvesting, Currents, Introduction to Weather, Polar Weather, Man-Made Weather, Rain, Violent Weather, Heat and Weather, Weather Systems, Water Cycle*. A User's Guide is included, containing an overview; a numbered index of clips, with brief descriptions and lengths; time codes (VHS only); suggested instructional strategies; and a list of additional resources. A Discovery Channel/FFH&S Production. © 2003.

Earth Story

- **8-part series**
- **VHS/DVD-R #8503**
- **"Extremely well done!" —*Booklist***

Beginning with the first land formations that emerged from the ocean 4 billion years ago, this series explores how all geologic phenomena, from volcanoes to earthquakes, are intertwined. Journeying from the sea bottom to the highest peak in the Andes, the series presents theories on plate tectonics, earthquakes, volcanoes, land formations, and continental drift. An indispensable

resource for teaching earth science and geology. A BBC Production. (50 minutes each)

The series includes *Dating the Earth, Journey to the Ocean Floor, Continental Drift: Legacy of Fire, Death of the Dinosaurs, Winds of Change, Noah's Children, Oxygen: The Poison Gas, The Earth and the Moon.*

Landforms

- **CD-ROM #6978 (Windows only)**

What causes volcanoes and earthquakes? Why do tsunamis and floods occur? How do river beds and coastlines change? And what challenges do the forces that shape the Earth pose for people? Using this highly interactive CD-ROM, students can freely explore the Geodome, a virtual laboratory of geologic landforms. Learning stations provide targeted opportunities to manipulate 3-D topographical models, conduct simulations of natural disasters, examine hundreds of slides, and watch video clips. Plus, info/quiz features offer additional background and test comprehension. Headline-making catastrophes and issues of geologic concern drive home the present-day relevance of earth science, geology, and physical geography. Plate tectonics and seismology, eruptions and erosion, landslides and sedimentation—this disc has it all.

The Life and Times of El Niño

- **VHS/DVD-R #34956**
- **Closed captioned**

It has been linked to famines, epidemics, even the fall of empires. This program follows El Niño's deadly path through human history and the progress science has made in understanding the once-mysterious phenomenon. The effects of El Niño are presented in detail, including an 1878 outbreak of yellow fever in Tennessee, a concurrent drought that ravaged much of China, and more recent calamities that have brought the true nature of this climatic occurrence to light. Focusing on high-tech advances in meteorology, the video outlines El Niño's significance in the global warming debate and illustrates the use of computer models that can predict its next appearance. A BBCW Production. (50 minutes) © 2005.

Man and the Biosphere

- **12-part series**
- **VHS/DVD-R #2333**
- ***Recommended by Science Books & Films***

Using an integrated interdisciplinary approach combining the natural and the social sciences, these videos look at the relationships between living beings and their environments. The work of botanists, biologists, geologists, and demographers is used to examine the realities of ecological concerns in the framework of political realities. From the tops of the Himalayas to the bottom of the sea, from empty deserts to overcrowded cities, these videos show life where it thrives and where it has died out. Based on UNESCO's ground-breaking Man and the Biosphere Program, they illustrate the problems and concerns of preserving life, including human life, on Earth, and demonstrate numerous environmental projects that have successfully met the needs of both humankind and nature. (28 minutes each)

The series includes *Life in Arid and Semi-Arid Lands; The Desert as Laboratory; Life at the Top*; *Equilibrium in a Mountain Habitat; The Tropical Rain Forest; Preserving the Rain Forest; Coastlines; Ecology of the Coral Reef; Lagoons; Wetlands and Pinelands; Urban Ecology; Toward a Livable City.*

BioBasics

- **8-part series**
- **VHS/DVD-R #33833**
- **Preview clip online at www.films.com (Search on 33833)**
- **Includes viewable/printable Teacher's Guide**
- **Correlates to National Academy of Sciences National Science Education Standards and the American Association for the Advancement of Science Benchmarks for Science Literacy**
- **"A welcome replacement for outdated life science programs."—*School Library Journal***

Use the comprehensive 8-part *BioBasics* series to excite your students about life science as you present the fundamental concepts they'll need for a firm foundation in biology. An engaging blend of computer graphics, interviews with scientists, and animations will hold their attention as they open their minds to a wide range of essential life science topics.

The series includes *Introduction to Life Science; Cells: The Building Blocks of Life;Genetics and Evolution; Organization and Diversity; Life Processes of Animals; Life Processes of Plants; Microorganisms; Interdependence of Life.* A Cambridge Educational Production. Viewable/printable teacher's guides are available at www.cambridgeeducational.com. (25 minutes each) © 2005.

For information on other programs

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www.cambridgeeducational.com

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