

University of California, Riverside
College of Natural and Agricultural Sciences

STUDY GUIDE for the video

EARTH 101: WHAT HOLLYWOOD CAN TEACH US ABOUT OUR PLANET

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In March through May 2012, the College of Natural and Agricultural Sciences (CNAS) and the community support group Science Circle presented the fifth in their annual series of science lectures. The four lectures in the series, named “Earth 101: What You Need to Know about Life on Our Planet,” were delivered to standing-room-only audiences in the University of California, Riverside, Extension Center. The lectures were delivered a second time, and videotaped, in the campus’s television studio to small audiences of middle- and high school students. The teachers of these students had partnered with the faculty lecturers during development of the lectures, and subsequently the pairs wrote these study guides to be used in conjunction with the videos, to help educate young people about important issues facing our planet.

For more information about the Science Lecture Series, email sciencedean@ucr.edu or visit cnas.ucr.edu/sciencelectures/.

The other three lecture videos are:

Earth 101: Too Many People?

Earth 101: What’s Your Carbon Footprint?

Earth 101: Where Does Your Water Come From?

These 58-minute videos and their study guides are available for download at <http://cnas.ucr.edu/sciencelectures/slsvideos.html>.

Objective

Students will improve their awareness of the role of plants in their daily lives.

California State Standards

K — Kindergarten, G — Grade (followed by the numerical grade)

- a. K — Students know how to observe and describe similarities and differences in the appearance and behavior of plants and animals.
- b. K — Students know how to identify major structures of common plants.
- c. G1 — Students know different plants and animals inhabit different kinds of environments and have external features that help them thrive in different kinds of places.
- d. G1 — Students know roots are associated with the intake of water and soil nutrients and green leaves are associated with making food from sunlight.
- e. G2 — Students know flowers and fruits are associated with reproduction in plants.
- f. G3 — Adaptations in physical structure or behavior may improve an organism's chance for survival. As a basis for understanding this concept:
 - a. Students know plants and animals have structures that serve different functions in growth, survival, and reproduction.
 - b. Students know examples of diverse life forms in different environments, such as oceans, deserts, tundra, forests, grasslands, and wetlands.
- g. G3 — Students know when the environment changes, some plants and animals survive and reproduce; others die or move to new locations.
 - a. Students know that some kinds of organisms that once lived on Earth have completely disappeared and that some of those resembled others that are alive today.
- h. G4 — All organisms need energy and matter to live and grow.
- i. G4 — Living organisms depend on one another and on their environment for survival.
- j. G5 — Students know plants use carbon dioxide (CO₂) and energy from sunlight to build molecules of sugar and release oxygen.
- k. G6 — Organisms in ecosystems exchange energy and nutrients among themselves and with the environment.
- l. G6 — Students know energy entering ecosystems as sunlight is transferred by producers into chemical energy through photosynthesis and then from organism to organism through food webs.
- m. G7 — The anatomy and physiology of plants and animals illustrate the complementary nature of structure and function.
- n. G7 — Students know the structures and processes by which flowering plants generate pollen, ovules, seeds, and fruit.
- o. Ecology 9 – 12: Stability in an ecosystem is a balance between competing effects. As a basis for understanding this concept:
 - a. Students know biodiversity is the sum total of different kinds of organisms and is affected by alterations of habitats.

Prior Activities

Choose one of the following:

- a. Give students 1 minute to write down all the things they saw that day on way to school or class. Circle all plants or green items mentioned.
- b. Pair/Share: Give students 1 minute to write down what they can remember about the movie *Avatar* (Pair Up students who have not seen movie with those that have, or use *Fern Gully*).
- c. Ask students to brainstorm in pairs or groups of three or four: What is the purpose of the Save the Planet, Save the Earth, Save the _____(animal), and Recycle programs?

Listen to the Lecture

Choose one of the following:

- a. Write down things they did not know. Pair/Share notes with others (1 or 2 min.)
- b. Create a four square using plants, scientific vocabulary, and careers to take notes on lecture and summarize information written down.
- c. Cornell notes

Closure Activities

Choose one of the following:

- a. Create an advertisement that reflects the voice of nature.
- b. Research one or two careers related to plants and write a short description of each which includes college classes of math and science needed and create a career action figure.
- c. What are some of the characteristics of plants that were mentioned in the lecture? Find two real plants that have one particular trait.

Extension or enrichment activity:

- a. Philosophical Chairs or Socratic Seminar or Parliamentary debate: “Whether schools or society are obligated to educate and participate in the reduction of human impact on the environment.”
- b. Assignment that Dr. Holt uses in her introductory course, “Foundations of Plant Biology,” that you can modify for your age group (on next page).

Course: “Foundations of Plant Biology,” UC Riverside

Laboratory Exercise 10

Special Projects: Uses of plants

Objective: The purpose of this lab is to demonstrate the abundant and extraordinary ways in which plants affect your daily lives. You will also gain experience in finding and using various sources of botanical information.

I. INTRODUCTION

Now that you have spent several weeks of this quarter learning the fundamentals of plant biology, you will turn your attention to the practical applications of this knowledge. Plants have played a role in human affairs for millennia and today are vitally important as food, fiber, fuel, building materials, cosmetics, medicines, ornamentals, lawns, landscapes, and in recreation (e.g., soccer fields and parks).

II. THE ASSIGNMENT

Your assignment is to sharpen your powers of observation about uses of plants in your daily life. Take some time to look around your house, apartment, or dorm room. Make a list of at least 10 items you see around you that are made of plants or contain plants or plant products. Also list the plant ingredient in each item. Be astute—do not list the obvious things, like fruits and vegetables in your refrigerator or things named for the plant they come from (e.g., corn oil). The most obvious things you will notice, besides plants as food, are some articles of furniture and clothing. By now you should know what part of the plant constitutes wood. But do you know what part of the cotton plant is used to make your tee shirts? What about things that are a few steps away from plants, such as processed food, condiments, or medicines? Do you know what plant provides most of the sugar you eat? Are there plant products in your root beer, analgesics (e.g., aspirin), chewing gum, shampoo, or lip balm? After you have listed at least 10 things in or around your home that are made of plants or contain plant products and have accurately indicated the source plant, mark one item on your list to research in depth and give your list and selection to your teaching assistant. (The deadline for turning in your list and selection to your TA will be announced in class). Your TA may ask you to choose an alternate topic from your list to avoid duplication within a lab section. After your choice is approved, use information sources such as your textbook, library books, journals, the internet, newspapers, etc., to research your chosen item. Find out as much as you can about this item, including at least the Latin (family, genus, and species) and common names of the plant from which your item comes, where this plant species is found naturally or where it is cultivated, and how your chosen item is produced or derived from this plant. Be sure that botanical and other information you cite is accurate. Material from Wikipedia and other unsigned internet sources should be verified by other signed sources.

III. THE REPORT

You must prepare a short written report (not less than one, not more than two, single-spaced pages) that includes everything you found out about your chosen item. List your sources in proper scientific format at the end of your report. A minimum of three sources is required, at least one of which must be a book or published article (refereed electronic journals are okay). Prior to the Laboratory 10 session, you must submit your written report At the Laboratory 10 session you will give a short (3 minutes maximum) oral report about your chosen item and what you have learned about it. No visual aids are required except to bring your item, or if it is too large or unavailable, a photograph or drawing of it, to pass around. Grading for this exercise will be as shown on the grading sheet below.

LABORATORY EXERCISE 10 GRADING SHEET

Name _____

Laboratory Section/TA _____

Criterion	Comments and points (0-5 for each)
1. Did the student turn in a list of 10 things containing plants or plant products?	_____
2. Did the student turn in a paper on one thing that he/she researched?	_____
3. Does the paper contain legitimate information about this item, such as its source, where it is found, how it is produced, etc.?	_____
4. Does the paper include the sources of information for the report?	_____
5. Did the student give an oral report that was understandable and informative?	_____
Total points	_____



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Using the Internet for Research

Of incoming freshmen surveyed this past summer, over 75% strongly agreed or agreed with the statement, "Everything is on the web." Many students are turning to Internet search engines to find research material on-line. While the Internet can be a useful resource for research, it is important that material found on-line be evaluated carefully.

Differentiating Among Sources

Many faculty make a great effort to differentiate between scholarly and popular print sources when directing students to research materials. But when students are told "no Internet sources," many assume this rules out valid electronic sources like the on-line periodical databases (indexes), electronic journals, and the netLibrary collection of e-books that the University Libraries provides to students and faculty. Students should be reminded that these valuable sources are legitimate sources for research.

On-line databases <<http://databases.lib.vt.edu/dbs.cfm>>

Electronic Journals <<http://www.lib.vt.edu/research/ejournals/prelude.html>>

netLibrary <<http://www.lib.vt.edu/research/netlibrary.html>>

Evaluating Web Pages

Search Engine Watch estimates that there are over one billion Internet sites available (June, 2000) and unlike most traditional information media (books, journals, newspapers), no one has to approve the content before it is made public. Since web pages can be created by anyone, the researcher must determine the suitability of the information presented. The checklist presented on the right is a starting point for evaluating information found on the Internet. A more complete explanation can be found at <<http://www.lib.vt.edu/research/libinst/idle/idleeval.html>> along with examples and exercises.

Citing Sources

As with print sources, internet sources of information should be properly cited in research papers. While citation styles used differ across disciplines, a common characteristic of citing information found on the Internet is to include the date the information was accessed. This allows for the ephemeral nature of web pages that can change or disappear over time. The University Libraries maintains a web page with links to many citation and style manuals at <<http://www.lib.vt.edu/research/resources/eref/citation.html>>.

Evaluating Web Pages Checklist

AUTHORITY

- ✓ Is the page signed?
- ✓ Are the author's qualifications available?
- ✓ Does s/he have expertise in this subject?
- ✓ Is the author associated with an educational institution or other reputable organization?
- ✓ Does the publisher or publication have a reputation for reliability?
- ✓ Is contact information for the author or group available on the site?

COVERAGE

- ✓ Do you think it is useful to you?
- ✓ What does this page have that is not found elsewhere?
- ✓ What is its intrinsic value?
- ✓ How in-depth is the material?

OBJECTIVITY

- ✓ Does the information show a minimum of bias?
- ✓ Is the page designed to sway opinion?
- ✓ Is there any advertising on the page?

ACCURACY

- ✓ Is the information reliable and error-free?
- ✓ Is there an editor or someone who verifies/checks the information?

CURRENCY

- ✓ Is the page dated?
- ✓ If so, when was the last update?
- ✓ How current are the links?
- ✓ Have some expired or moved?

