



**CONTRASTS IN BLUE:**  
Life on the Caribbean Coral Reef and the Rocky Coast of Maine

Smithsonian Institution  
November/December 1996

- [Cover](#)
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**CONTRASTS IN BLUE**

A travel poster for the Bahamas features the clear azure water of the coral reef, where a diver encounters an electric blue and yellow angelfish. A Maine vacation brochure depicts gleeful children gathering mussels among the boulders, as powerful waves crash upon the rocky shore. These distinctive scenes describe two very different marine ecosystems: the coral reef of the Caribbean and the rocky coast of Maine.

The striking contrasts between these two dynamic ecosystems are the theme of this issue of *Art to Zoo* and are among the many topics visitors can ponder in *Exploring Marine Ecosystems*, a permanent exhibition at the Smithsonian's [National Museum of Natural History](#). The activities that follow encourage students to consider the role of temperature, sunlight, waves, and tides in the creation of unique marine environments.

[Download the November/December 1996 issue \(785K\).](#)

The [Adobe Acrobat Reader](#) is available for MacOS and Windows.

Please e-mail us with any comments or suggestions.

## Inside

Understanding the Internet  
Getting Connected

## Grades

4-9

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THE INTERNET AND YOU



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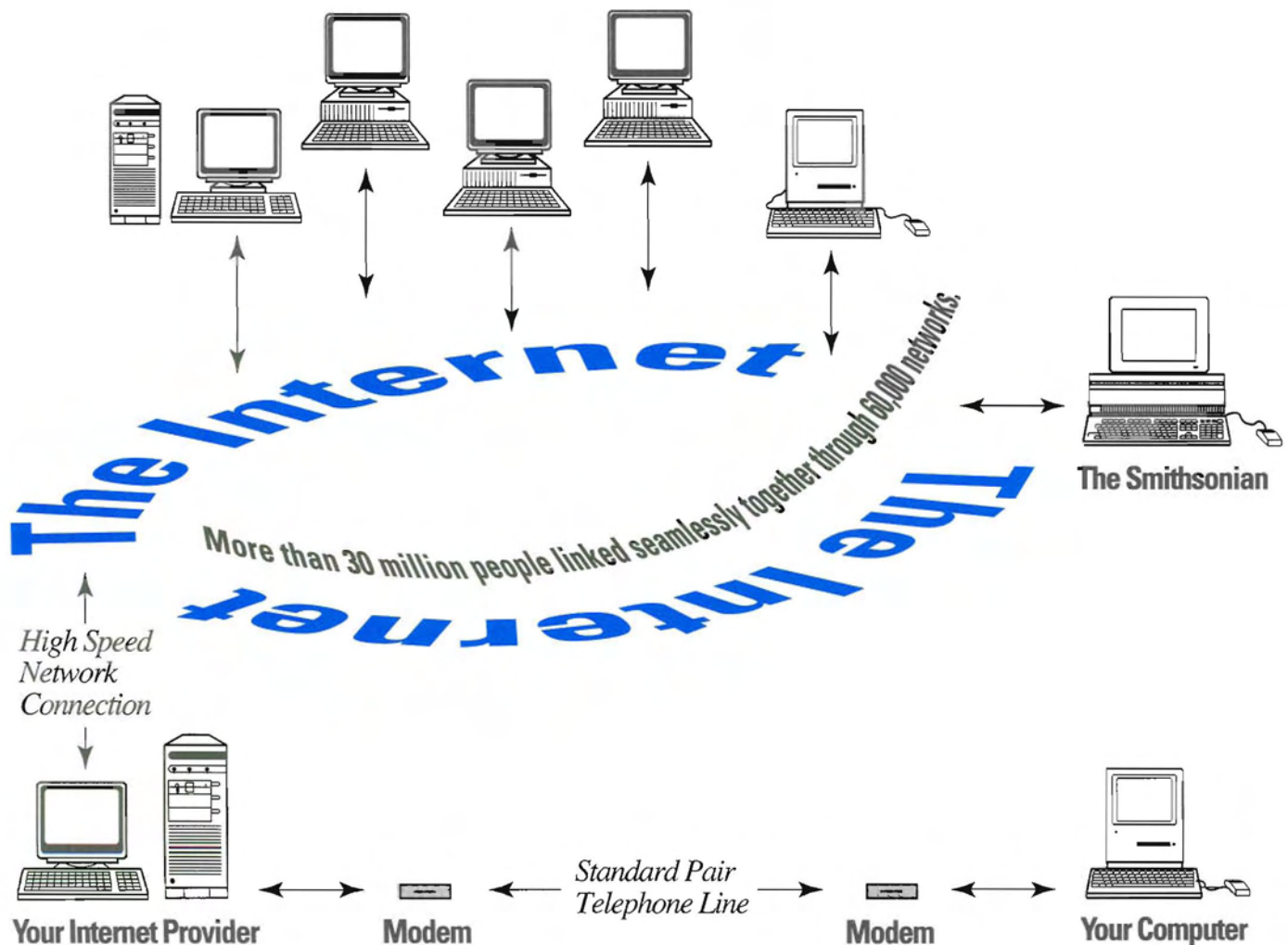
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*Art to Zoo*'s purpose is to help teachers bring into their classrooms the educational power of museums and other community resources. *Art to Zoo* draws on the Smithsonian's hundreds of exhibitions and programs—from art, history, and science to aviation and folklife—to create classroom-ready materials for grades four through nine. Each of the four annual issues explores a single topic through an interdisciplinary, multicultural approach. The Smithsonian invites teachers to duplicate *Art to Zoo* materials for educational use.

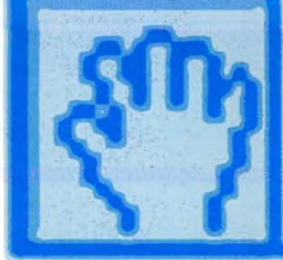
You may request a large-print, Braille, audiotape, or computer disk version of *Art to Zoo* by writing to the address listed on the back cover or by faxing your name, school name, and address to (202) 357-2116.

**T**hese and a host of other new buzz words fill the newspapers, news broadcasts, and informal conversations we hear every day. We know that the Information Age is here and wonder what it has in store for us. Will the online world help me find background materials and lesson plans for my classes? Does it really offer all of the text, sound, and movies that would appeal to students' various learning styles? Will it help me to develop new ways of teaching old subjects, reenergizing these disciplines for a new and technically savvy generation? Can I learn how to use these online resources? The answers to these questions are yes, yes, yes, and a definite YES! ►►

# ONLINE *Interactive* The Internet THE WORLD WIDE WEB







## INTERNET TERMS

**Server**—A computer or software package that allows network users to “download,” or transfer to their computers, files or programs. Client software (such as an Internet browser) allows you to retrieve these files. Once they reach your computer, the browser interprets and displays the files as hypertext, images, sound, or movies, depending on their format.

**File Transfer Protocol (FTP)**—A special way of connecting to an Internet site to retrieve or send files. Many Internet sites have materials on their servers that anyone can download using the account name *anonymous*. Such sites are called *anonymous FTP servers*.

**Gopher**—Another way of connecting to an Internet site through special client and server software. Gopher software allows a user to find materials through a user-friendly system of menus.

**Uniform Resource Locator (URL)**—A World Wide Web address. Every file on the Web has its own unique URL, which browsers such as Netscape Navigator and Microsoft Internet Explorer use to call up and display the contents of that particular file.

A World Wide Web URL looks like this **http://www.si.edu** (the Smithsonian home page—your gateway to the Institution!)

and an FTP URL looks like this **ftp://photo1.si.edu/images** (the Smithsonian Office of Imaging, Printing, and Photographic Services—lots of great images!)

*(Note: Due to the dynamic nature of the Internet, some or all of the URLs listed in this issue may have changed since publication.)*

**Electronic mail (e-mail)**—A way of exchanging messages through the Internet. It’s faster, cheaper, and often more convenient than regular postal mail. See Figure 2 for information on how to read an e-mail address.

This issue of *Art to Zoo* attempts to dispel the mysteries surrounding the Internet. Although claims that the ‘Net is transforming research, teaching, and business may seem daunting, connecting to and using it is easy if you follow the few simple pointers on these pages. You will also find that many of the traditional forms of teacher support—like *Art to Zoo* and the Smithsonian’s other teaching materials—have online versions, too, making these publications available at your fingertips twenty-four hours a day. The customizable and interactive age of the Internet has arrived, and it is here for you!

## WHAT IS THE INTERNET?

Today’s Internet, in a physical sense, is a collection of sixty thousand linked computer networks that connect more than thirty million people. This system provides a platform for people worldwide to share information. When you connect to the Internet, you become part of a diverse electronic community rich in educational resources.

On the Internet, you can exchange mail with friends and colleagues around the world, participate in discussion groups with

leading experts, search libraries and archives for a particular book or magazine, tour online versions of museum exhibitions, and gather software, pictures, sound, video, and text that can help you plan your lessons and expand your students’ understanding.

## CONNECTING TO THE INTERNET

You can connect to the Internet in many ways. Your school may already have one or several computers with links to the Internet. Be sure to check with your school’s computer specialist or media specialist for details. Another resource is your local library system, which often has computers set aside for people who want to use the Internet for research purposes.

From your home you may reach the Internet through commercial or nonprofit (“freenet”) Internet service providers. Check the business or classified section of your local newspaper for a sampling of these services in your area.

To connect to the Internet from your home, you’ll need an account with a service provider as well as a computer, modem, telephone connection, and the network software appropriate for your computer’s operating system (e.g., Macintosh, Windows, UNIX). Check with individual providers for details on your setup requirements; many offer Internet software free when you begin using their services.

## INTERNET SHOPPING LIST

- ✓ Computer
- ✓ Modem
- ✓ Telephone connection
- ✓ Internet software



## A BRIEF HISTORY OF THE INTERNET

The Internet was developed to meet the particular conditions of the Cold War era. The U. S. military needed a decentralized communications network that could survive global nuclear conflict. So, in 1969, the Pentagon launched a network of four computers, known as ARPANET, to experiment with decentralized communications. Researchers at universities and defense corporations soon saw the collaborative potential of ARPANET and connected thousands of their own computers to the network during the 1970s. In the 1980s, the National Science Foundation greatly improved upon the original ARPANET design by adding many more high-speed links to what was now a huge network of networks.

By the 1990s, the Internet had become far more than a military communications system. Commercial and educational use skyrocketed as people began connecting to the Internet through desktop computers and interacting with the user-friendly and graphically rich World Wide Web.

## THE WORLD WIDE WEB

When people talk of the Internet today, they're often referring to the World Wide Web, the newest, fastest growing, and arguably most popular method of accessing the Internet. On the Web, hypertext (highlighted text that contains "links" to other documents), graphics, sound, and video files are mixed together seamlessly, enabling easy access to a wide variety of information sources.

Many corporations, government agencies, and educational institutions (including the Smithsonian) have realized the tremendous communication power of the Web and have built extensive World Wide Web sites. The information in this issue of *Art to Zoo* will help you to use the online version of this publication and explore the many exciting Smithsonian resources on the World Wide Web.

## Ocean Planet: Interdisciplinary Marine Science ...

### Ocean Planet Interdisciplinary Marine Science Activities

Sea Secrets

Sea Connections

Ocean Market

Pollution Solution

Stranded Along  
the Coast

Reflections on  
the Sea

### brother

This publication was  
made possible by a  
generous grant from  
Brother International  
Corporation.



After centuries of seafaring, we're only now beginning to plumb the workings of our watery planet. The deeper we go, the clearer it becomes that no matter who we are or where we live, we all have a hand--and a stake--in what happens in the seas.

The Smithsonian Institution created the exhibition *Ocean Planet* to share with the public what recent research has revealed about the oceans and to encourage ocean conservation. This online booklet of lessons and activities adapts several themes of the exhibition for use in the middle and high school classroom.

*Ocean Planet* has six lesson plans. "Sea Secrets" explores ocean geography; "Sea Connections" looks at the plants and animals that live in different marine ecosystems; "Ocean Market" identifies and values many products of the seas; "Pollution Solution" examines the effects of an environmental crisis; "Stranded Along the Coast" explores both natural and human causes of animal strandings; Finally, "Reflections on the Sea" explores the influence of oceans on language and literature.

Each of the six lesson plans has the same elements: background information; statement of learning objectives; list of required materials; step-by-step procedures; student handouts (in Adobe Acrobat format); and a list of additional resources, including connections to the online version of the *Ocean Planet* exhibition.

The instructional approaches in *Ocean Planet* are interdisciplinary. Lesson plans will work in different classes, from biology and mathematics to geography and social studies. Many activities employ students' writing skills.

We hope that the lessons in this online booklet may guide students to better understand the diversity and importance of the seas.



[Return to Curriculum Materials](#)

## ANATOMY OF AN E-MAIL ADDRESS

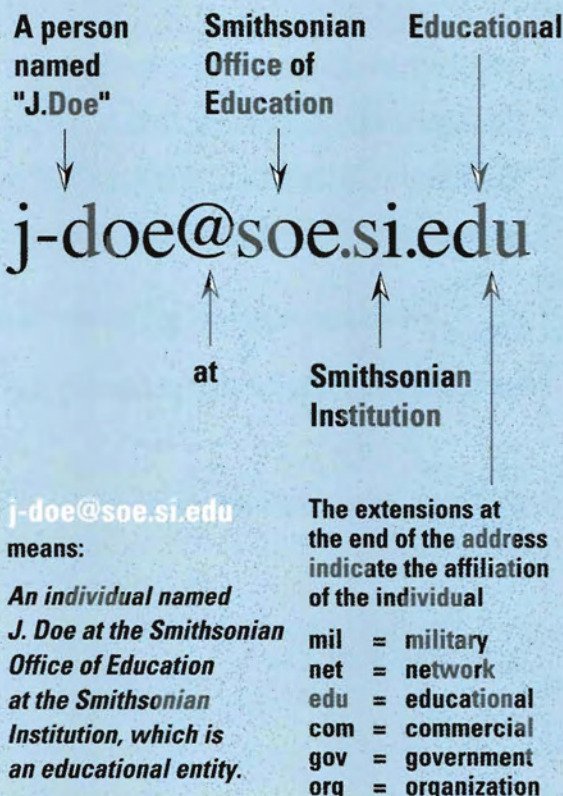


Figure 2. Reading an e-mail address.

Figure 1. The *Ocean Planet* curriculum kit online.





# How Do I Use Art to Zoo on the World Wide Web?

To use *Art to Zoo* on the Web, you'll first need to get access to the Internet (see "Connecting to the Internet," page 4) and a graphical Web browser. You will also need another piece of software, the free Adobe Acrobat Reader, as explained below. Although many graphical Web browsers are available, we recommend that you use either Navigator (version 2 or higher) or Internet Explorer (version 3) to properly display the magazine's online design. If you do not have one of these software programs, you can request them from your



Figure 3. The *Art to Zoo* index page online.

provider or download them at the following URLs:  
<http://home.netscape.com> for Navigator,  
<http://www.microsoft.com> for Internet Explorer. If you do not already have a Web browser, call either Netscape at 415-937-3777 or Microsoft at 800-426-9400 or visit your local computer supply store. (Note: Neither the Smithsonian Institution nor SOE endorses any of these products over any others. We merely suggest them because they support the format of our online publications.)

Once you have the Web browser software, follow the installation instructions for your computer platform. Web browser software often comes in a compressed format, which shrinks large files and allows for faster download times. Make sure to follow the instructions for decompressing the software on your computer platform.

With the Web browser installed, you are ready to explore the Web. Open, or "launch," the browser and type the address below in the text field labeled "Location" in

Contrasts in Blue

  
Teaching With the Power of Objects


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## The Dynamic Coral Reef



*Corals, sponges, sea fans and fish flourish on a reef.*

Within the reef exists a complex food web in which nothing goes to waste. Animals such as conch, sea urchins, and surgeonfish graze on algae, thereby preventing it from overtaking and killing the coral. Huge eyed squirrelfish feed along the reef at night and help keep the grazers in check. Sea fans and sea anemones wave back and forth in the water column, using their tentacles to catch particulates and tiny organisms floating in the water. Other reef animals eat the coral or the mucus that coats it.

The coral reef ecosystem displays a complex interdependency of organisms. Some depend more on each other than others and develop symbiotic relations. The corals and zooxanthellae are one example of a mutually beneficial relationship. Another example is the cleaners and their hosts. Organisms such as the scarlet banded shrimp and neon goby "clean" other organisms by removing parasites and food particles from their gills and mouths. The cleaners get food while the host organisms stay free of potentially harmful parasites.



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[eseem010@si.edu](mailto:eseem010@si.edu)

Figure 4. An Art to Zoo background essay online.



Navigator or "Address" in Internet Explorer:

<http://educate.si.edu/lessons/art-to-zoo/azindex.html>.

Press the "Return" or "Enter" button on your keyboard. After a few seconds (depending on the speed of your connection) you will see the *Art to Zoo* index page. From there, place your cursor on top of one of the *Art to Zoo* titles shown in hypertext and click to view that issue.

Each *Art to Zoo* has a consistent look and is easy to navigate (see figure 4). The sidebar on the left side of the

screen contains the magazine's table of contents. To view any of these sections, click on the desired lesson plan, background essay, or resource page.

The power of *Art to Zoo* online lies in its ability to link you to the vast resources of the Internet. If you're reading an *Art to Zoo* background essay, you can click on any number of hypertext links that take you to other sites with even more information on your subject of choice!

The screenshot shows a web browser window titled "Contrasts in Blue". The main content area features a large graphic with the text "OCEAN PLANET SMITHSONIAN" and "A Smithsonian Institution Traveling Exhibition". Below this, it states "will be on view at The Bishop Museum Honolulu Hawai'i May 17, 1997 to October 5, 1997". A link "ENTER THE EXHIBITION HERE" is provided. A list of bullet points describes the exhibition's history and resources. At the bottom, contact information for Gene Carl Feldman and Judith Gradwohl is listed, along with a link to the Smithsonian homepage. A sidebar on the left lists the contents of the "CONTRASTS IN BLUE" issue, including the cover, background essay, lesson plans, and resources. The browser's status bar at the bottom shows the URL: [http://seawifs.gsfc.nasa.gov/OCEAN\\_PLANET/HTML/ocean\\_planet\\_overview.html](http://seawifs.gsfc.nasa.gov/OCEAN_PLANET/HTML/ocean_planet_overview.html).

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**OCEAN PLANET**  
SMITHSONIAN  
A Smithsonian Institution Traveling Exhibition

will be on view at  
The Bishop Museum  
Honolulu Hawai'i  
May 17, 1997 to October 5, 1997

[ENTER THE EXHIBITION HERE](#)

- *Ocean Planet*, premiered at the Smithsonian Institution's [National Museum of Natural History](#) from April 1995 to April 1996, where it attracted nearly two million visitors. This electronic online companion exhibition contains all of the text and most of the panel designs and images found in the [traveling exhibition](#).
- Find out more about the plans for *Ocean Planet* at the [Bishop Museum](#).
- Learn more about the project by reading an [overview](#) of the exhibition, a [message from the curator](#), or a copy of the [final report](#) which presents information about visitation, educational programming and materials, publicity, and the results of the visitor studies.

[gene carl feldman \(gene@seawifs.gsfc.nasa.gov\) \(301\) 286-9428](#)  
[Judith Gradwohl, Smithsonian Institution \(Curator Ocean Planet\)](#)

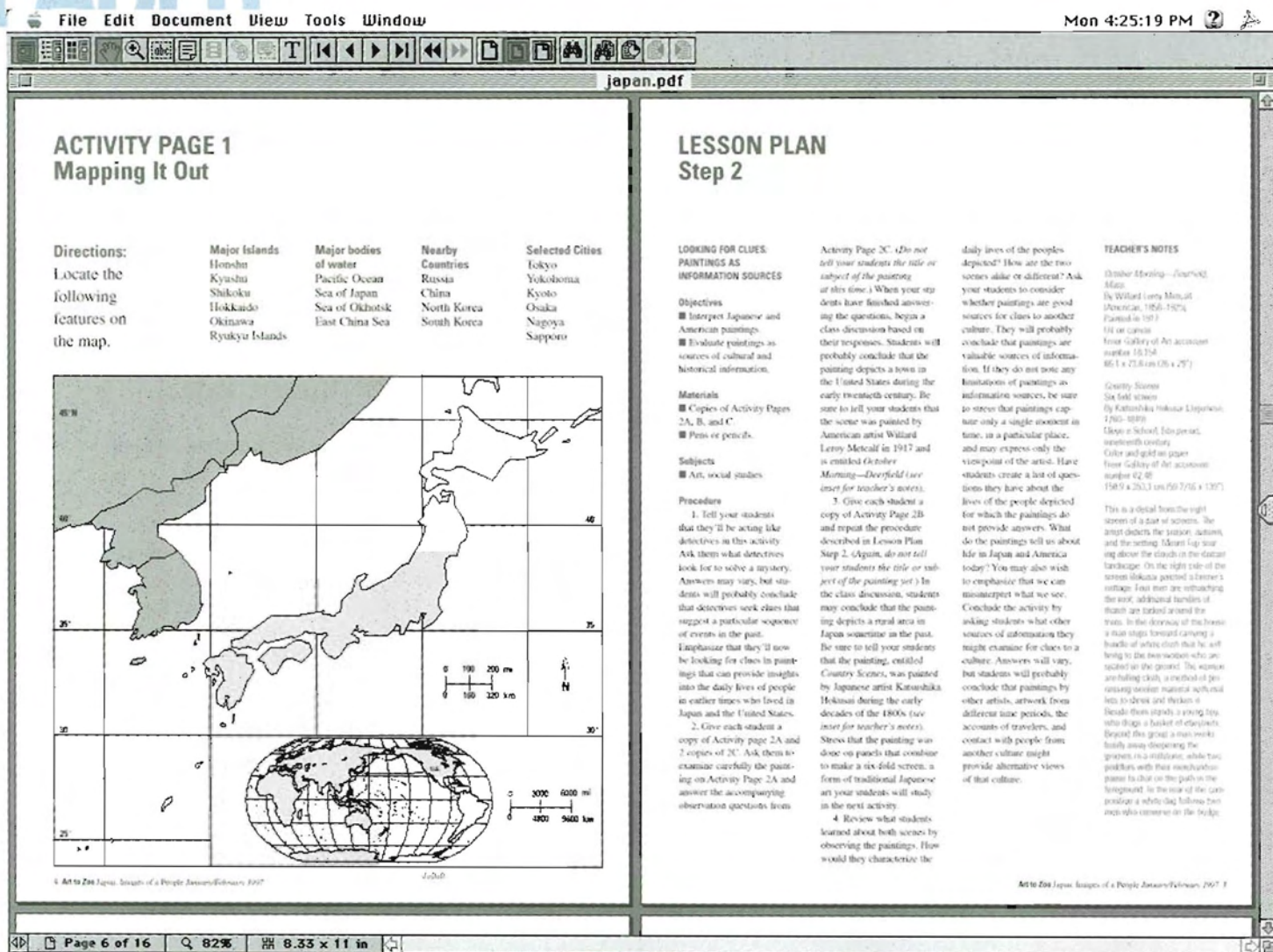
[Visit the Smithsonian Homepage](#)

Link: [http://seawifs.gsfc.nasa.gov/OCEAN\\_PLANET/HTML/ocean\\_planet\\_overview.html](http://seawifs.gsfc.nasa.gov/OCEAN_PLANET/HTML/ocean_planet_overview.html)

**Figure 5.** The *Ocean Planet* exhibition, as viewed in an *Art to Zoo* window.



The online *Art to Zoo* can also deliver the printed issue directly into your classroom through the Adobe Acrobat Reader. This application allows you to view the publication on screen exactly as it appears in the printed version, including authentic fonts and graphics, no matter what type of computer platform you have. You can even print the entire publication or individual student activity pages to any printer for use in your classroom! (Note: To view and print colors, you must have a color monitor and printer, respectively.)



**Figure 6.** An *Art to Zoo* student activity page and lesson plan, as viewed in the Adobe Acrobat Reader.



All you need to make use of this innovative technology is the free Acrobat Reader.

You can obtain this software in two ways: on CD-ROM or by downloading from the Internet. The disks on which many operating systems and software applications come often include other related software such as the Acrobat Reader. If none of your CD-ROMs contain this software or if you do not have a CD-ROM drive, you can get the Reader by downloading it from one of the following URLs:

<http://www.adobe.com/acrobat/readstep.html> or  
<ftp://ftp.adobe.com/pub/adobe/applications/Acrobat>.

These sites and the CD-ROMs include important instructions on how to install the software.

Once you have installed the Acrobat Reader, you may find it helpful to configure your Web browser to launch the Reader whenever you download a file in Acrobat format. Check your browser's documentation for specific configuration instructions.

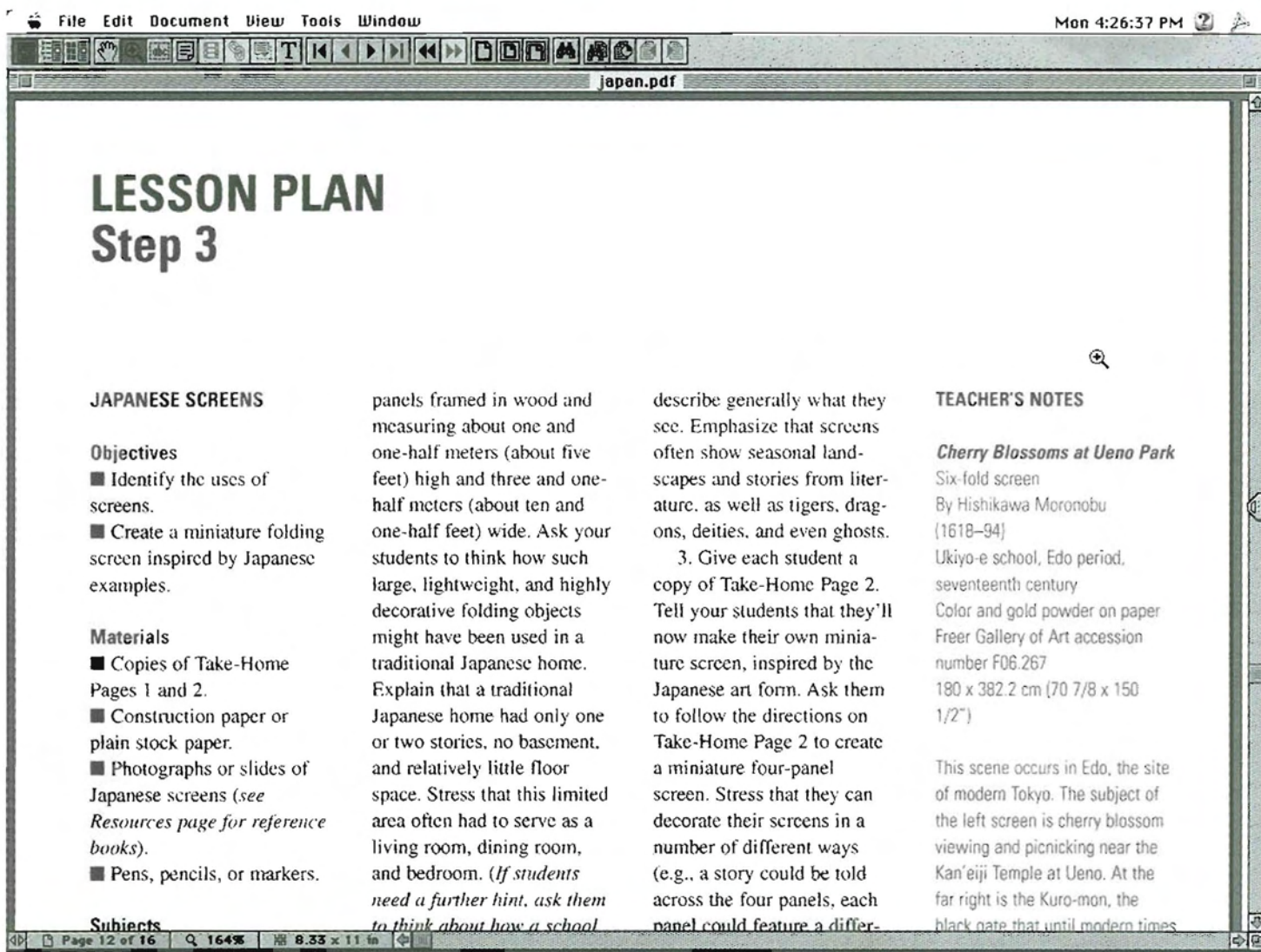
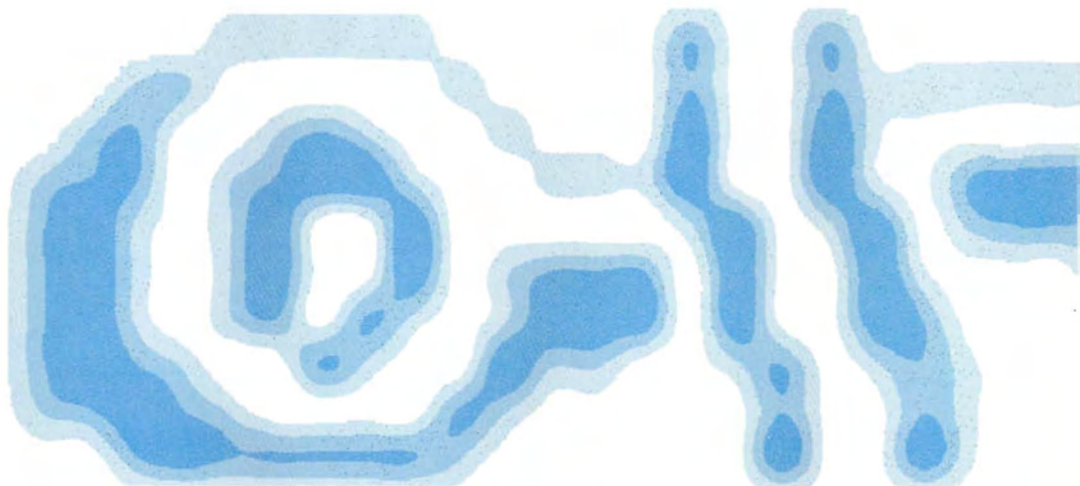


Figure 7. A click of your mouse enlarges your view of *Art to Zoo* within the Adobe Acrobat Reader.

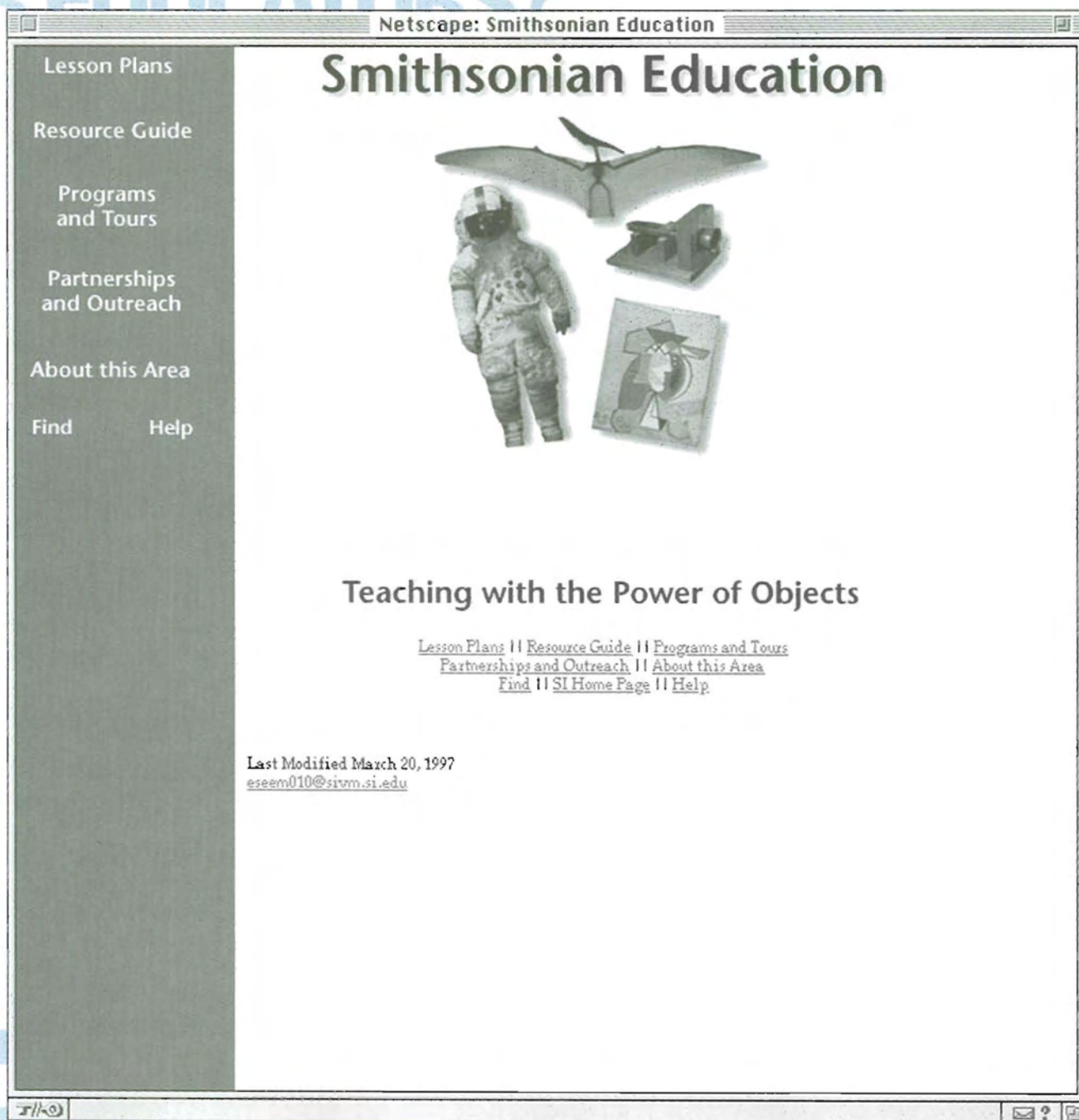




## What Does the Smithsonian Web Site Have for Educators?

A lot! By the time you receive this issue, the Institution will have launched an area specifically for educators that will enable easy access to online curriculum materials, program information, and publications.

To reach this special education area, go to the Smithsonian Home Page, <http://www.si.edu>, and click on the "Resources/Tours" icon. From the "Perspectives of the Smithsonian" list, click first on "Education at the Smithsonian" and then on the "Go to" button.



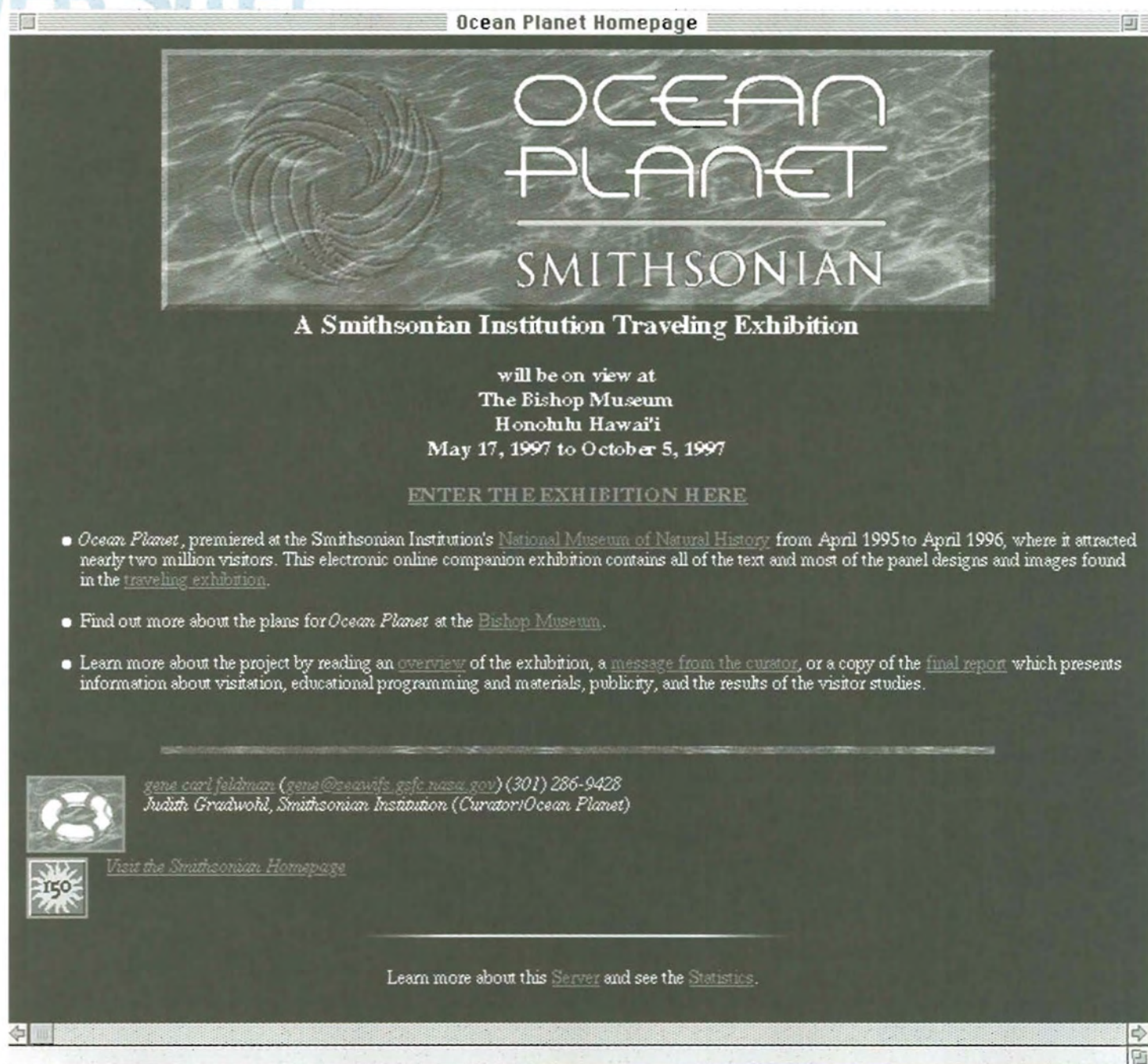
**Figure 8.** The Smithsonian Institution Education Area Home Page.

Be sure to mark the Smithsonian's education area so that you can easily return to it in the future. In Navigator, go to the "Bookmarks" menu and select "Add Bookmark." In Internet Explorer, go to the "Favorites" menu and select "Add Page to Favorites."



## What Else Can I Find on the Smithsonian Web Site?

The Smithsonian is as rich an educational resource online as it is on the National Mall in Washington, D.C. From the home page, you can link to all of the Smithsonian museums. Search through the many sites to find a dazzling array of online exhibitions, museum information, research data, graphics, sounds, and video that bring the Smithsonian to your desktop. Here are just a few of the exciting areas you can visit on the Smithsonian Web site:



**Figure 9.** The online *Ocean Planet* exhibition offers a wealth of information for educators.

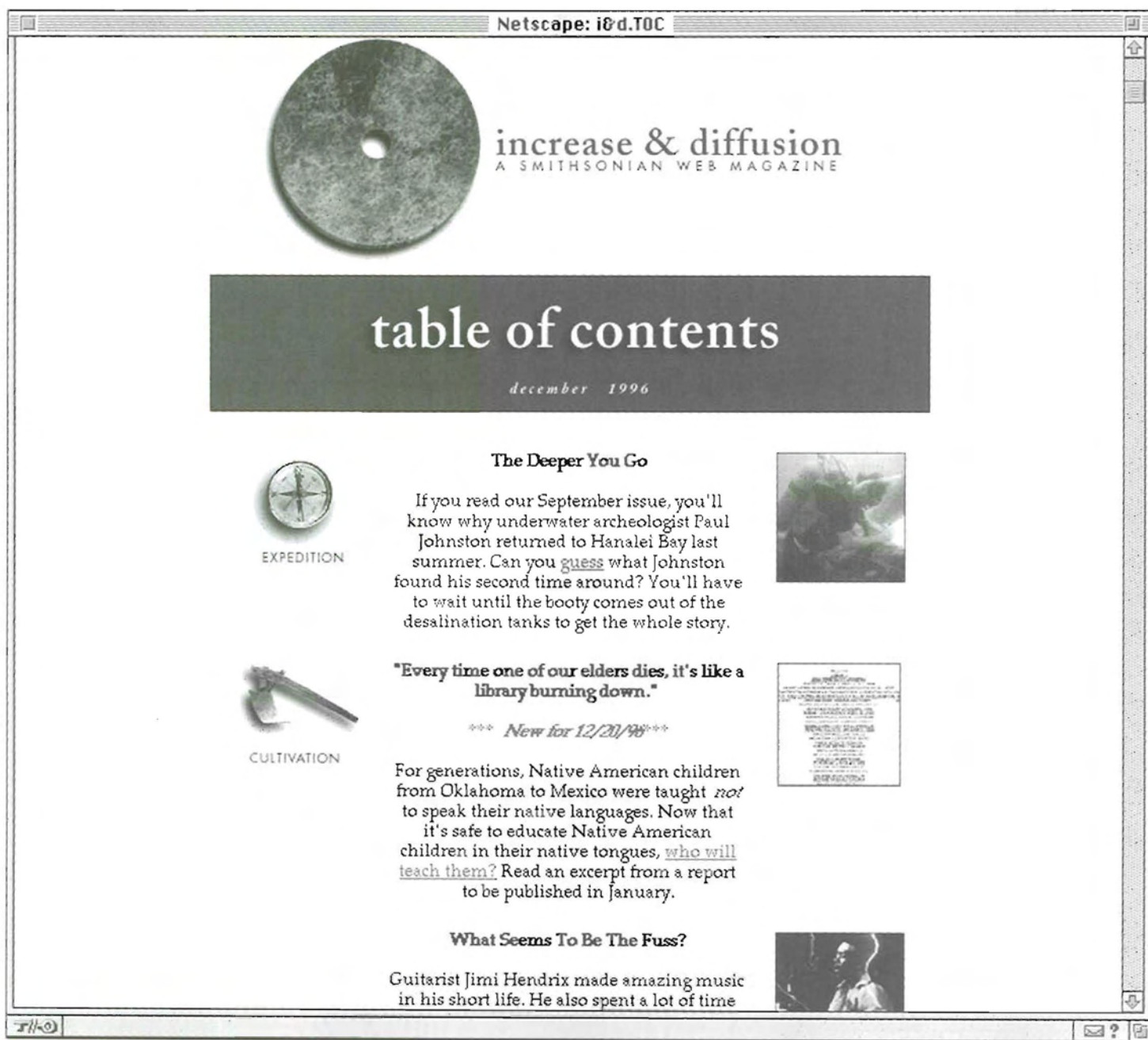


### Ocean Planet online

[http://seawifs.gsfc.nasa.gov/ocean\\_planet.html](http://seawifs.gsfc.nasa.gov/ocean_planet.html)

*Ocean Planet* online (see figure 9) is a virtual exhibition organized around an interactive floor plan. It incorporates all panel designs, text, graphics, video, and audio from the traveling, three-dimensional exhibition on which it is based. The exhibition text and electronic "Resource Room" provide

links to other sources of oceanographic and marine science information, including educational materials, brochures, and other publications developed for the *Ocean Planet* exhibition (including the September/October 1995 issue of *Art to Zoo* and the booklet *Ocean Planet: Interdisciplinary Marine Science Activities*).



**Figure 10.** The Smithsonian "e-zine" *Increase and Diffusion* explores many diverse topics in lively and engaging articles.





### Increase and Diffusion

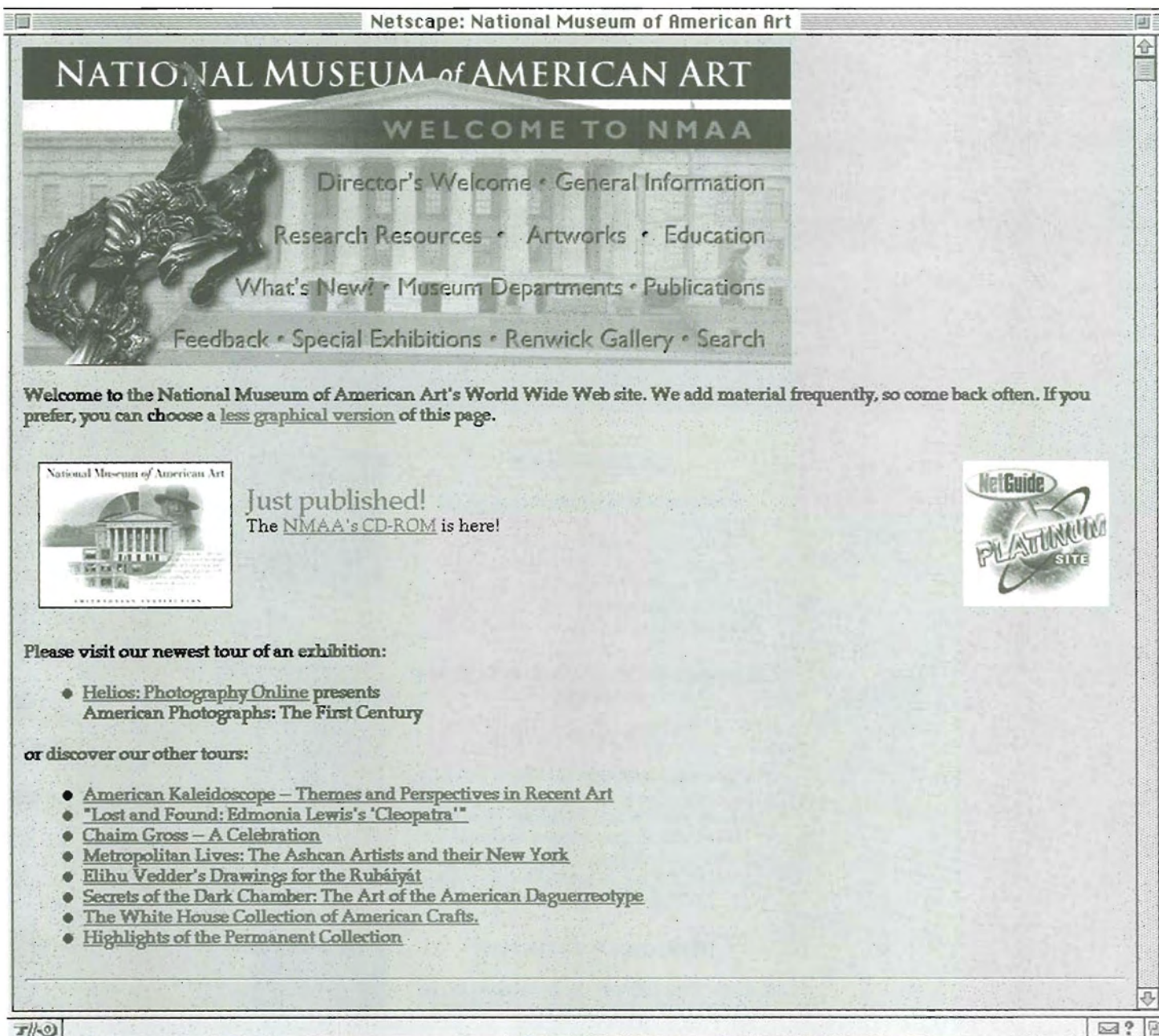
<http://www.si.edu/i+d/index.html>

*Increase and Diffusion* is a free, electronic Web magazine ("e-zine") aimed at capturing the breadth of activity at the Smithsonian Institution (see figure 10). Recent articles explore efforts to revive Native American languages, Jimi Hendrix's musical legacy, the 1960 Nixon-Kennedy debates, and a piece of civil rights history that recently arrived at the Smithsonian.

### National Museum of American Art Online Exhibitions

<http://www.nmaa.si.edu/>

Interactive, online exhibitions abound at the National Museum of American Art (see figure 11). Among the virtual exhibitions that the museum has recently developed are *American Kaleidoscope—Themes and Perspectives in Recent Art*; *Lost and Found: Edmonia Lewis' Cleopatra*; *The White House Collection of American Crafts*; and *Highlights of the Permanent Collection*.



**Figure 11.** Educators will find many intriguing online exhibitions at the Smithsonian's National Museum of American Art.



# RESOURCES

Hoffman, Paul E. *The Internet Instant Reference*. San Francisco: Sybex, 1995. For ordering information, go to <http://www.sybex.com/books.html>.

Irvine, Martin. *Web Works*. New York: Norton, 1996. For an exhaustive and user-friendly overview of the Internet; its historical, technical, and cultural origins; and how to use it to your best advantage in the classroom, visit the *Web Works* site, <http://www.wwnorton.com/webworks>.

Levine, John R., Carol Baroudi, and Margaret Levine Young. *The Internet for Dummies*. 3d ed. Foster City, California: IDG Books Worldwide, 1995.

Levine, John R., and Margaret Levine Young. *More Internet for Dummies*. San Mateo, California: IDG Books Worldwide, 1996. You can order both *Dummies* books at the following URL: <http://www.dummies.com>.

Kehoe, Brendan P. *Zen and the Art of the Internet*. 4th ed. Upper Saddle River, New Jersey: Prentice-Hall, 1996. The original version of this guide is also available online at [http://www.cs.indiana.edu/docproject/zen/zen-1.0\\_toc.html](http://www.cs.indiana.edu/docproject/zen/zen-1.0_toc.html).



## HELP US BUILD!

Join the Smithsonian Office of Education in building a new education area on the Smithsonian Institution World Wide Web site. We are seeking motivated educators who would like to test educational materials online as they are developed. Your involvement may include one or more of the following activities:

- ☐ commenting on proposed features in, or organization of, the Smithsonian education area
- ☐ testing lessons in your classroom
- ☐ commenting on student use and understanding of the Internet
- ☐ telling us how you use the Smithsonian Web site and its education area

To participate as a "beta tester," you need a computer capable of displaying at least 256 colors, a 14.4-Kbps (or faster) modem, an Internet connection, and a Web browser capable of displaying frames and tables (e.g., Navigator version 2 or higher or Internet Explorer version 3 or higher). For more information, contact Michelle Smith, SOE publications and electronic media director, at [smithmk@soe.si.edu](mailto:smithmk@soe.si.edu).

## ART TO ZOO

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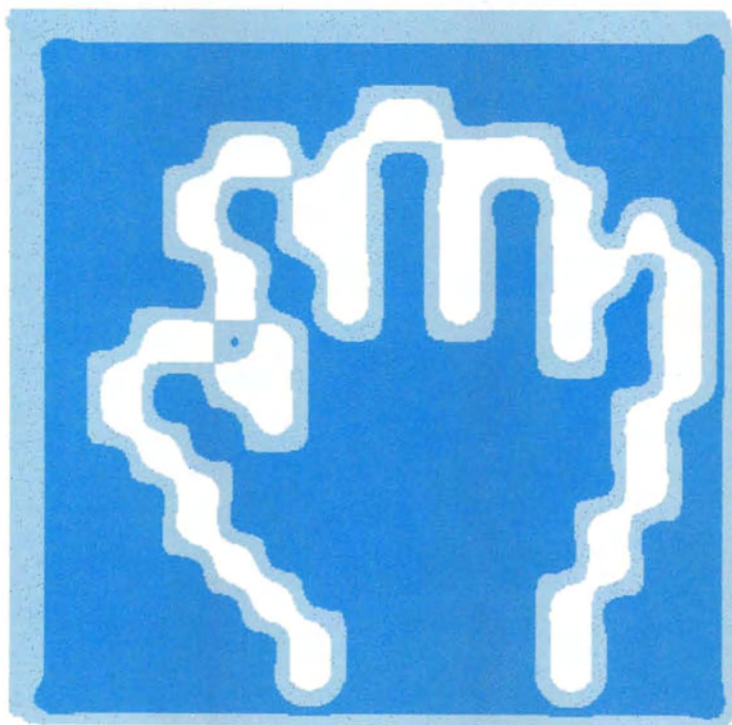
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☐ This is my home address.

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