



Digital Cave Exploration

Carlsbad Caverns

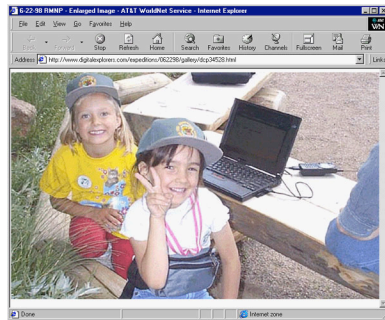
DEXpedition
March 1, 1999

Digital Cave Exploration – a DEXpedition

Carlsbad Caverns 1999

About the Digital Exploration Society - www.digitalexplorers.com

The Digital Exploration Society (DEX) was founded early in 1998 to foster greater awareness and understanding of the interdependence between people, the planet we inhabit and the technologies we create.



The DEX mission is to explore the potential of advanced mobile digital technology **1)** to advance our appreciation of the natural world and our place within it, **2)** to promote a more fulfilling and sustainable human lifestyle, and **3)** to accelerate the usability and deployment of digital technology for creative, life-enhancing activities.

DEX launches, sanctions and supports interactive Digital Expeditions in all parts of the world. These expeditions serve as test-beds for new technologies and new uses for existing technologies. Digital Explorers share their discoveries with a global audience via the World Wide Web on the DEX Web site.

Carlsbad Caverns Digital Expedition - Overview

On March 1, 1999, a team of Digital Explorers will descend 754 vertical feet into the Carlsbad Caverns in New Mexico to participate in the first DEX *Digital Spelunk*.

The Digital Cave DEXpeditions will use modern Internet, digital imaging, computing and digital projection technology to allow elementary school students to “paint” the caverns with their own “primitive” drawings.

Carlsbad Caverns is one of the major cave systems in the US with pictographs (paintings on rock surfaces using pigments) created by native people hundreds of years ago. In this unique event--part field trip, part science education, and part performance art--contemporary human children will express themselves with “digital pictographs” on ancient cavern walls without blemishing the fragile cave surface. The digital paintings will appear only briefly in the caves, but the images will live forever on the World Wide Web.

While on-site in the caverns, the images will be called up on laptop computers and then projected onto the cave formations. Standard view and 360-degree digital cameras will capture the scene. The images will be formatted and uploaded to the Carlsbad DEXpedition Website. In near real time, classmates in the home classrooms (as well as students worldwide) will be able to browse the Web and see their paintings as they appear projected on the cavern's features.

Carlsbad Caverns – www.nps.gov/cave/

Children have assisted in the discovery of Carlsbad Caverns since the beginning; the first recorded exploration of Carlsbad Cavern was orchestrated by Ben Sublette in 1883. Instead of going in himself, Ben lowered his 12-year old son Rolth on a rope into the darkness below. Yet in the present day, little more than a century later, more than 600,000 people a year venture through areas of Carlsbad Cavern.

Caves are fragile environments that are affected by human activities and natural processes both underground and on the surface. Although caves are a delicate non-renewable resource, they are a continual source of exploration, wonder and discovery.



Carlsbad Caverns National Park was established to preserve Carlsbad Cavern and numerous other caves within a Permian-age fossil reef. The park contains more than 83 separate caves, including the nation's deepest limestone cave -- 1,597 feet (486.8 m) -- and third longest. Established first as a National Monument on October 25, 1923, it was made a National Park on May 14, 1930.

Curriculum Development and Pre-planning

Prior to the event, a representative of DEX will visit the class of each participating school and meet with the teachers in preparation for the Digital Expedition. Once a curriculum complementary to the school goals is established, class work will be developed for a one-hour teaching and discussion of the DEXpedition. Students will be invited to participate at their school; a select few will go with the Caverns Team.

The DEX leaders will teach a scheduled class session, either during art, science or natural history segments, to familiarize the students with the objectives, and to encourage them to participate. Each student will be asked to create a "cave painting", on paper or the computer, which will be intended for projection onto the cavern walls.

The leaders will discuss the special qualities and the research going on at Carlsbad Caverns, such as the bat research, to encourage inspiration and

connection to the special environments at Carlsbad and the surrounding Guadalupe Mountains.

During the class pre-session, the leaders will discuss the history and scientific importance of Carlsbad Caverns to engage the children in their cyber adventure. Expedition leaders will explain to the children that cave paintings have been found not only at Carlsbad, but also on the walls of caves in many parts of the world. These early expressions were often the sites of prehistoric artistic and religious communication.

- Why did those people paint in caves?
- What do the strange drawings mean?
- What messages or feelings were they trying to communicate?
- What messages do modern day kids have to communicate?
- What modern day tools do we use in present day communication?
- If they were down in those caves, what would they like to see digitally projected onto the walls?

Finally, the leaders will introduce the relay technician(s), who will be in the classroom while the DEXpedition members are in the Cavern. On the day of the expedition, this liaison from DEX will be on hand to operate the technology at the school, help the kids and teachers relay messages to the team in the caves, and help them view the Web site as the children's own images are posted to the Internet.

Prior to departure, the leaders will collect the art and digitize it for projection onto the cavern walls and for display in a virtual gallery. The digital art will be saved to a laptop computer for the trip to New Mexico.

The DEXpedition members will travel to New Mexico from Denver and Boulder Colorado in four-wheel drive Discovery II vehicles provided by Land Rover of North America. Students from the Los Angeles area will cover their farther distance by air, although technical people and journalists will bring additional Discovery II trucks from the West Coast.

Host children from the Pate Elementary School, Carlsbad, New Mexico will join their out-of-state compadres to share knowledge of the Caverns, communication techniques, and other jointly developed lessons.

The groups will meet in White's City, New Mexico for an evening briefing and assignment of projects. Equipment and uplinks will be tested at that time.

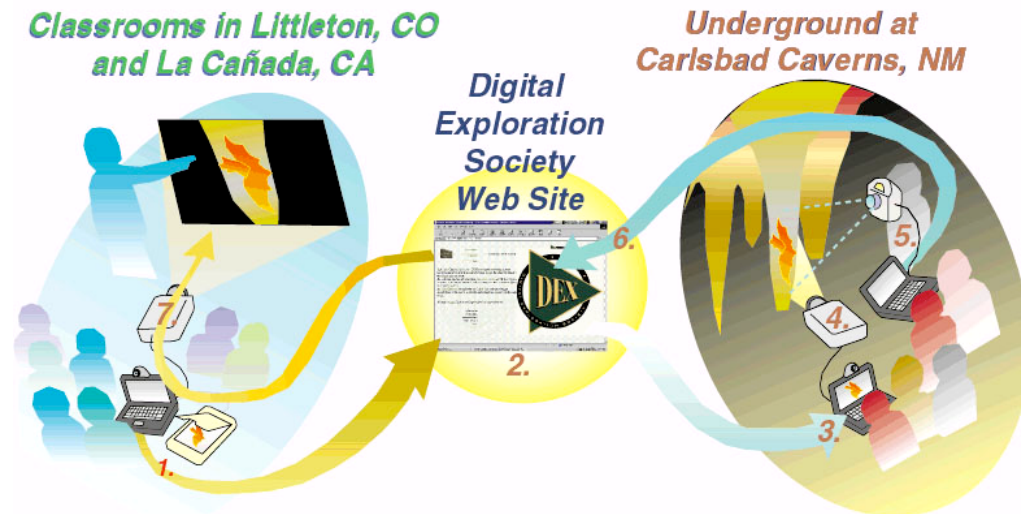
The morning of the event, the Cavern Teams will descend with National Park Service Guides to the cavern floor, set up and begin to project the digital cave paintings. Small teams will take tours and participate in digital explorations with specific assignments.

Telephone connection is available on the floor of the cave. Additional bandwidth may be available from GTE. If possible, television conferencing between laptops in the caves, or above the caves may allow students to communicate their impressions and questions in virtual "face-to-face" discussions from hundreds of miles apart.

During the DEXpedition, each student group will be given an assignment. Maps and diagrams of the area will be created and transmitted, and the DEX team students will be asked to record and comment on the activity, discoveries and observations below the surface.

At the end of the day, the team will emerge from the cave to witness and record the original pictographs at the natural cavern mouth. Images of the rock art as well as the student's interpretations will be uploaded to the DEX Website.

Production Plan



1.) While in the Caverns a live link will be established to send and receive e-mail and to reload finished images to the DEX web site (2.) between the classrooms in Colorado, New Mexico, California, the on-site team and the World.

3.) The images will be fed to a laptop computer that is attached to the projectors.

4.) The digital cave paintings created by the school children will be projected onto the cave walls.

5.) A digital camera will capture the image of each design. These pictures will be loaded onto another laptop and sent to the DEX Website via the local link.

6.) Images and information will be posted onto the DEX Carlsbad Caverns Website, as they become available. Some digital video clips will also be captured, but streaming video in real time will only be possible if enough bandwidth can be arranged.

7.) Back in classrooms in Littleton, CO (a suburb of Denver), La Cañada, CA (north of Los Angeles) and Carlsbad, NM, students will be able to see their work as projected on the cavern walls.

Using LivePicture and digital cameras, the team also will create Virtual Reality views of the DEX team in action and interesting formations. A guide from the National Parks Service will be on hand to answer student queries, and to add important information to the Web site.

The Cavern Team will consist of 33 children and at least 32 adults, not including journalists. The DEX adults will include ten teachers, eleven leaders/technical people, and thirteen parents, including writers, geologists, educators and technologists.

While the core team is projecting and recapturing the projected cave pictographs, small groups of four to six children and at least three adults will accompany a National Parks Service Guide on excursions to other parts of the cave. These teams will be given special assignments to capture impressions to share on the web.

The Colorado School Team will include several adults and students from The Hope Center and the Mackintosh Academy.

Classmates in Colorado will participate during special class sessions from the new gym at The Mackintosh Academy. Hope Center children will join their sister school in Littleton to see their art projected and sent across the Internet.

The California School Team will include several adults and students from La Cañada Elementary School. South Pointe Middle School students will assist with the Web development, disbursement of information from the explorers, and research material.

Other classmates at South Pointe will assist the students with web technologies, and broadcast the results on the extensive Ethernet LAN system throughout the school.

The Carlsbad School Host Team will consist of students, some who have studied and toured the Caverns, and participate in special technical programs at Pate Elementary, joining their guests from out-of-state to enhance learning, friendship and sharing.

The Support Team will include several DEX members in Colorado and California who will do pre-design, site building, Internet data base building and implement technologies which will allow the remote teams to function efficiently.

DEXpedition Schools

A mix of schools and levels will participate from Colorado, New Mexico and California. Some young artists will be family members of DEX members. The schools have been selected for innovative programs, enthusiastic support and emphasis on creative teaching methods.

Colorado: The Mackintosh Academy (Mackintosh) is a school for gifted and talented children, grades PK to 8. **The Hope Center** is an inner city school affiliated with Mackintosh and noted for its excellent curriculum.

Although the gifted/talented program has just begun at the Hope Center, students are thriving with the new opportunities offered.

California: La Cañada Elementary School (LCE) is a public school in the Los Angeles area, noted for accelerated programs. Twelve students from LCE will travel to Carlsbad, and their classmates will communicate with them from California. **South Pointe Middle School (SPM)** located in Walnut, California, is an advanced school of science and technology, equipped with up-to-date computers in each classroom, connected by a school-wide Ethernet to each other, servers and the World Wide Web.

New Mexico: Pate Elementary School (PES) is a 3rd, 4th and 5th grade school who will join as local hosts and hostesses.

**The Mackintosh Academy
Littleton, Colorado**

<http://home.earthlink.net/~macacad>

The teachers marked in bold face will accompany the group. Children have been selected for their exceptional skills in science, art and computer technology, and will represent their class as ambassadors. Although not all teachers will accompany the group to the Caverns, all will assist in curriculum development and presentation.

Division II (1st & 2nd grade) Teachers: Ms. Cathy L., **Ms. Rachel D.**
Division II students: **Rachel F., Jenna B.**

Division III (2nd & 3rd grade) Teachers: Mr. Dave Kelley, **Mr. Joe P.**
Division III students: **Joshua K., Cameron M.**

Division IV (4th & 5th grade) Teacher: **Ms. Peggy S.**
Division IV students: **Trevor F., Mallory M., Jered C.**

Division V (Middle School) Teachers: Ms. Sharon M., Dr. Bill H.
Division V students: **Ian M. and one other to be named**

Division VI (Middle School) Teacher: Mr. David C.
Division VI students: **Kelsey C., Katie S.**

Art Teacher: Ms. Raquel C.
Science Teacher: **Mr. David C.**
Mackintosh Curriculum Director: Whitney M.

Parents: **Doug Filter and Dale B.**, DEX charter members,
Jim C., Robbie M., David and Cindy S., parents

**The Hope Center
Denver, Colorado**
Principal: George B.
Two parents to be named
Four students to be named

DEX member **Don M.**, National Center for Atmospheric Research
Wes M., Louisville Elementary student, Colorado

La Cañada Elementary School
La Cañada, California

Teacher: **Ms. Barbara L.**

6th grade student **Whitman L.**

6th grade student **David F.**

6th grade student **Daniel C.**

9 additional 6th grade students

Parents: **Rob Lindstrom**, DEX co-founder, **Aaron F.**, parent

3 additional parents

DEX member **Richard A.**

6th grade student Lily A.

South Pointe Middle School
Walnut, California

Instructor: Dave F.

DEX Member: **Dan F.**

Four students to assist with Web site construction

Eighth grade science students will assist on a rotating basis

All science students will observe from individual classrooms.

Pate Elementary School
Carlsbad, New Mexico

Instructor: **Kris B.**

Six to Eight host children

DEX Team Members

Robert Lindstrom, DEX executive director, author, journalist and lecturer.
Rob will serve as the Carlsbad Caverns DEXpedition co-leader (California)

Doug Filter, DEX co-founder, author, multimedia producer.
Doug will act as co-leader (Colorado), Caverns contact and the educational programs coordinator

Dan Filter, Web designer and education coordinator, DEX Charter member.
Dan will teach and support in the Los Angeles schools. He will create a program for students to provide some simple Web page creation, to be included on the site. Dan will also supervise middle school students who will assist in design and implementation of the LA-based digital photo servers.

Rob Sklenar, DEX co-founder, Web designer and programmer.
Rob will coordinate the online and computer technology

Dale Boller, Writer and teacher, DEX Charter member.
Dale will write lessons and design teaching tools for the classrooms. He will

also design project assignments and lead cave excursions for small teams of children to explore digital tools and the fragile cave environment.

Todd Iorio, Multimedia technician, DEX Charter member.

Todd will oversee the operation of the cave technology and the transmission of the digital images.

Phil Merrill, DEX co-founder, online marketing specialist.

Phil will serve as project scribe, writer's liaison and product loan coordinator

Andy Hadel, Internet and multimedia designer, DEX Charter member.

Andy will co-design for the master Carlsbad Web site

Trip Mackintosh, headmaster of Mackintosh Academy.

Trip will be the Educational press liaison, and will host international educators from France.

Tim Harrod, computer guru and former instructor at Mackintosh Academy.

Tim will operate the computer links from Denver, and explain the technology to the students and the press.

Sponsors – *not finalized*

Land Rover North America

Ten Discovery II four-wheel-drive vehicles for safe transport from CO and CA

Casio

4 QV-5000SX digital cameras

Proxima

5 1500 ANSI lumens projector for caverns and classrooms

Hitachi

M2 still/video MPEG camera

GTE Southwest

Internet access to the cave floor

Regular POT phone service

Best Western Caverns Inn, White's City, NM and **Best Western Santa Fe, NM**, Lodging

LivePicture

Virtual Reality software for the PC

RealNetworks

Streaming video transmission

National Park Service

Cave history education & tours, supervision, electricity and lighting

Cavern Supply Company (concessionaire)

Onsite meals and refreshments.

Press

A complete, up-to-date list of participating journalists is available from Doug Filter, DEXpedition co-leader. A television network has expressed interest in sending a crew along on the Digital Expeditions, with additional coverage in each classroom. Radio commentators have also indicated interest. Some National Publications will send writer/photographers. Some Internet news services have been notified, and are expected to follow the story. Local newspaper and broadcast journalists have been invited to attend. Journalists will also be invited to visit the classrooms in Los Angeles and Denver.

After the expedition is completed, the images and story will be submitted to a variety of consumer and business publications for consideration.

Schedule

Sat/Sun, Feb 27-28 - The DEXpedition team travels to Carlsbad, NM

Monday, March 1 – Digital Cave Painting in the caves, 9am-4pm.

Tuesday, March 2 - The DEXpedition team returns home

Budget

To be determined

Contacts

Doug Filter, Expedition co-leader, Denver

Rob Lindstrom, Expedition co-leader, La Canada, CA

Trip Mackintosh, Headmaster, Mackintosh Academy

George Brantley, Headmaster, The Hope Center

Aleta Knight, Carlsbad Caverns special events coordinator
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3225 National Parks Highway
Carlsbad NM 88220