Maps are indispensable classroom tools for investigating and learning about the past. Historic maps, in particular, allow students to step back in time and see the world through the eyes of those who lived in other eras. The Lewis and Clark Expedition is an ideal topic for classroom inquiry using historic maps. Through the investigation and analysis of historic maps, your students can gain valuable insights into the objectives and impact of this legendary journey. The David Rumsey Map Collection web site provides extraordinary resources to engage your students in just such an investigation. The site includes both historic and contemporary maps of the expedition route as well as specific expedition data such as campsite locations and dates.

**David Rumsey maps online**

Rumsey is a map collector who has made his vast collection available for online research. On the Rumsey site, your students can begin their investigation by examining a map of North America that predates Lewis and Clark. Figure 1 shows a map of western North America at the time of the Lewis and Clark expedition. Questions that might arise from this map include:

What does this map tell us about the extent of knowledge about western North America at the time of the Lewis and Clark expedition?

Which parts of the map are most detailed? Which are least detailed? Why is this so? What geographic misconceptions are revealed by this 1802 map?

By exploring this map, your students will begin to appreciate and understand the gaps in geographic knowledge that provide the true historic context of the Lewis and Clark expedition.

When they examine the maps that Lewis and Clark actually published upon their return, your students will develop new insights and, undoubtedly, ask challenging questions. What were some of the landforms and bodies of water that Lewis and Clark discovered as they traveled? How did this journey change people’s perception of the American West? The Rumsey site provides many resources to address such questions. Maps from different sources and periods can be overlaid, for example. When your students want to know how accurate Lewis and Clark’s maps actually were, they can overlay those maps with a 21st century satellite image to make a direct comparison. How great are the discrepancies? Challenge your students to explain how a region with no established landmarks (from the point of view of the Expedition) could have been mapped so well.

**Maps reveal what was known**

The site includes a range of 19th century maps of the North American west. By comparing these maps and their dates, students can draw significant inferences about growing knowledge about this area, about the changes in political status as various regions proceed from territory to statehood, and about the gradual transfor-

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**Figure 1**
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mation of the wilderness as towns, railroads, and highways make their appearance. The set of maps available for exploration on this site offers a unique overview of two hundred years of American history. The potential for student inquiry is infinite.

Smart maps for students

The David Rumsey site is especially valuable and unique as a classroom tool because it also includes an interactive geographic information system (GIS) with which to view it. Geographic information systems are “smart maps.” Simply put, these systems link the geographic (G) data on maps with additional information (I) about features seen on those maps, using the power of computers to create responsive, adaptable systems (S). A geographic information system is more than just a computerized mapping program. In a GIS, for example, a map of the United States displaying the boundaries of states, major cities, rivers, and lakes can provide further information about each of those features. A student might click on a state to find its physical area, its capital, or its population density. One could use the GIS query function to identify all the cities that have a population greater than 1,000,000. And these are very simple applications of GIS technology.

Now imagine that you are looking at a map showing the route of the Lewis and Clark Expedition and all its campsites. GIS enables your students to click on any campsite or expedition segment to find pertinent information such as dates the campsite was occupied or whether the segment was part of the westbound or the eastbound journey. Using the query function, students can readily identify not only the westbound and eastbound routes, but the segments that Lewis and Clark traveled individually. Ask your students to identify the segments of the expedition by year to discover which parts of the journey took the longest, which the shortest amount of time.

Different browsers, simple to complex

The site also enables students to display the actual expedition route on any historic or contemporary map in the collection. Using this capability, students can investigate the Native American tribes that Lewis and Clark encountered. By overlaying the expedition route over a modern satellite image, students can speculate about the kinds of difficulties the physical environment presented to Lewis and Clark in the course of their journey.

There are actually three different levels of GIS available to users at the David Rumsey Map collection web site. The first is called a GIS Basic Browser and the second is called a GIS Professional Browser. The availability of these two versions means that the site can accommodate learners at a range of developmental and educational levels. The site even offers a third, 3D GIS browser, which allows users to experience a virtual fly-through of the map collections. What a way to study history! Best of all, the only thing that students need to begin their GIS investigations is a computer with access to the Internet. The Help menus in both the Basic and Professional browsers provide clear and simple directions for utilizing all the functions available.

Both the Basic and Professional browsers include two fascinating features: the QuadViewer and the ImageViewer. The QuadViewer allows users to focus on a particular area of the map and then observe that area as it is represented on three other maps. For example, Figure 2 displays four views of one trail segment: an 1802 map (prior to the expedition), the 1814 Lewis and Clark map of their expedition, an 1856 map of Northwest America, and a modern satellite image. The maps provide a fascinating view of the changing extent of geographic knowledge over two centuries and provide remarkable opportunities for your students.

The ImageViewer allows students to blend and overlap images in a variety of ways. Figure 3 shows a “blend” of the 1802 map and the contemporary color shaded relief satellite image. Using this
image, students can begin to answer some of the questions raised earlier, such as, “How much was known about western North America at the time of the Lewis and Clark expedition?” Or, “Can you find any geographic misconceptions revealed by this 1802 map?”

The final GIS browser allows users to experience the maps in 3D. It takes a little practice to learn how to fly through a segment of the trail or to hover above a particular location, but the process is fascinating. If you want to try the 3D browser, read the detailed help section linked to the 3D page.

There are many ways to utilize the David Rumsey site in the classroom. You can develop your own set of questions for your students to answer, you can let students develop and answer their own questions about the Expedition, or you might let students use the site to develop questions to exchange with each other. Whatever approach you choose, your students have the opportunity to investigate and draw their own conclusions, both of which are central to national science and technology standards.

Using the site’s integration of GIS and historic maps, your students can become active investigators: observing patterns, asking questions, and drawing inferences about the Lewis and Clark Expedition. Their learning results from an inquiry process, not from being provided with the right answer.

A technical note

The first time a user goes to the David Rumsey Historical Map Collection site, it is necessary to download a Java applet that is required to run the GIS browser. Depending on the configuration of your computers and your students’ computer skills, you may want to do this step on your own ahead of time. The very simple procedure is outlined below.

On the David Rumsey Historical Map Collection home page (http://www.davidrumsey.com), select GIS Browser

On the GIS and historical maps page, select View GIS Basic Browser or View GIS Professional Browser

The first time you do this, you will be asked if you want to download the Java applet required to run the GIS browser. Say yes to download the Java applet. After the script is downloaded, the GIS browser opens. Thereafter, the GIS browser will open when you click View GIS Basic Browser or View GIS Professional Browser.