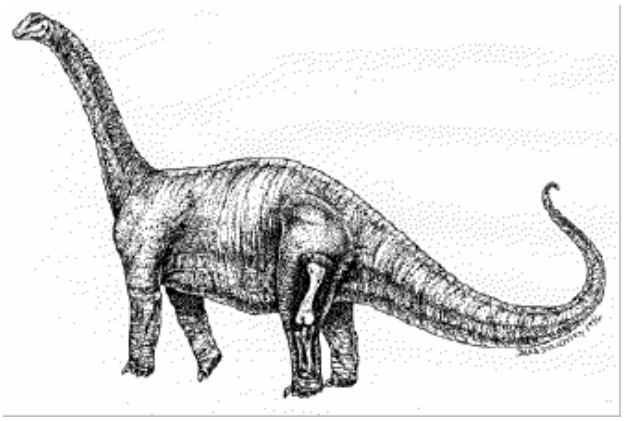
Rebekah K. Nix

A Day in the Desert Digging Dinosaurs

A Virtual Field Trip



A Day in the Desert Digging Dinosaurs

Introduction

The purpose of a "Virtual Field Trip" is to present studied concepts and facts in a "real-world" environment. This allows students to practice understanding by applying logic and reasoning in a unique, hopefully memorable, format.

A Day in the Desert Digging Dinosaurs describes a college student's experience in the field with dinosaur researchers. It consists of a brief PowerPoint presentation, supplemented with presentation notes. (This lesson may also be displayed using 35mm slides or color overhead transparencies.)

Other Activities

Additional class activities that complement this Virtual Field Trip include:

- Stage your own in-class "mini-dig" with plastic sweater boxes full of sand with bleached chicken bones, other artifacts and tools (trowels, sieves, brushes, etc.)
- Have teams research the diverse groups of dinosaurs by filling out a worksheet of characteristics, present findings, and compile a grid of dinosaur attributes
- Discuss the current "myths" about dinosaurs (commercialism, etc.)
- Take a field trip to the Dallas Museum of Natural History to see the exhibit and watch paleontologists preparing actual dinosaur bones
- Visit the UT-Dallas Dinosaur Web Site for updates on the dig! (www.utdallas.edu/dept/geoscience/dinosaur)

References

The following references have been used with respect to this presentation:

- Field notes: Rebekah K. Nix, June 1997, Big Bend Field Trip, UT-Dallas
- www.utdallas.edu/dept/geoscience/dinosaur
- http://advlearn.ldrc.pitt.edu/belvedere/materials/Mass-Extinctions-NF
- www.telson.net/whatsgps.html
- www.nmnh.si.edu
- www.dallasdino.org

Comments

This presentation was developed by Rebekah K. Nix to fulfill course requirements at the University of Texas at Dallas, under the direction of Dr. Homer Montgomery.

The trip to Big Bend National Park was taken June 08-13, 1997.

Image Quality. The original image output is 35mm color slides. Unfortunately, due to time and production constraints, the images used for this version of the presentation are third-generation conversions that have lost a great amount of color and resolution. Subsequent versions will have improved images.

A lot was learned about producing electronic presentations for general use through this exercise!

A Day in the Desert Digging Dinosaurs

Lesson Plan

This Virtual Field Trip emphasizes the scientific method and builds on a general familiarity with the desert environment, mapping, geologic time, sedimentary processes, and the 'art' of paleontology.

Class Outline

05 min Class Business
20 min Presentation: *A Day in the Desert Digging Dinosaurs*
15 min Activity: *Dinosaurs in a Haystack*
05 min Assignment: *Essay Exercise – Why is Dinosaur Research important to Me?*
05 min Class Summary

Materials

1. Windows PC or Macintosh (with projection capability)
2. PowerPoint Presentation: Dino Dig
3. Several bags of dried beans (black/pinto) or small candies (M&Ms) of contrasting colors
4. Large bowl
5. Measuring spoon or small scoop
6. White board or overhead and pens to record results

Objectives

The students will be able to:

- Apply mapping skills and geologic interpretations
- Recognize a diversity of life forms and geologic structures in a desert environment
- Formulate a hypothesis and predict outcomes based on local observations
- Experience (virtually) the process of collecting/organizing scientific specimens and data
- Compare the chances of finding rare and common fossils in an excavation

Expectations

The class will help students:

- Compare geologic time and events and relate them to their own time and space
- Develop an appreciation for the scientific process, the value of non-renewable resources, and the effects of earth science processes
- Gain an understanding of the application of science in daily life; evaluate the career implications of earth science principles and the findings of research

Activity

This is basically used as “food for thought” to emphasize the importance of scientific discoveries, like this Alamosaurus site. It can be accomplished quickly as a fun exploration.

Source: http://advlearn.ldrc.pitt.edu/belvedere/materials/Mass-Extinctions-NF

Dinosaurs in the Haystack

Purpose
To compare the chances of finding rare and common fossils in an excavation

Procedure

- Choose one color to represent your “rare” fossil (dinosaur)
- Count 10 of that color and remove all of the rest from the “population” (Don’t eat any yet! You’ll need to keep at least 60 of the “rare” kind for later.)
- Create a grid on the board or overhead to record data. Rotate students as “recorders”, “samplers” and “counters” for each step of the series.

Series 1:

1. Put your “population” in the bowl, including the 10 target items and all contrasting ones.
2. Mix them well.
3. Now you are ready to take a “sample”. Close your eyes and scoop out a level measure. (It should contain 30-40 items.)
4. Count the number of “target” items. Record this value.
   The 10 “Target” items represent organisms that might or might not have left fossils. The scoop represents a paleontological “dig” or drill core looking for fossils.
5. Count or estimate the number of nontarget items in the population and in the sample as well as the target ones. *(If you do this, you may be qualified to be a paleontologist. Paleontologists are patient! They look for needles in a haystack. Some paleontologists who examine microfossils look at the hay, too.)*
6. Put the sample (scoopful) back into the population (bowl). This is important!
7. Now repeat. Before you do, *predict what you think will happen*.
8. Repeat the process several times. For each trial, write down the number of the trial and the number of rare "fossils" you found.
9. Record the results of each in a column, with each trial on a separate line.

Series 2:

1. Now increase the number of target items in the population. Either add some of the selected color candies the reserved beans. Make this at least double the original number.
2. Record how many of the target items there are for this series. *Hypothesize: What difference will this make?*
3. Repeat the same procedure as in Series 1. Remember to put the scoopful back each time. *Why? Hypothesize: What would happen if you didn't.*
4. Continue with a MUCH larger number of target items. Make a table or graph of your findings. Predict what will happen when there are as many target items as non-target items.

In the hands-on model, you know that there are the same number of items in the bowl each time. You may have noticed that sometimes you found a "rare fossil" and sometimes you didn't. What happened there were more of your target fossils in the "population"?

Signor and Lipps (1983) explained that a rare type of fossil might not appear in a particular time period just by chance even though the animal or plant was living in that period. A more abundant kind of fossil would be more likely to be represented.

Look at your record. Think of each time when you took a scoop as one geological period. Although the same number of rare "organisms" was "alive" through all ten periods, it may appear as if their numbers got larger and smaller.

Was the rare fossil in every group every time? If it was absent in scoop 3, but present in scoops 2 and 4, you would assume it survived through period 3. But if it was absent in period 10, you might think it became extinct in period 9.

This is the Signor-Lipps effect: if a number of kinds of organisms all became extinct at one time, they might disappear from the fossil record at different times. Rare ones are less likely to be found in the latest deposits even if the animals or plants survived as long as common ones.

Assessment

Students will be asked to write a half-page essay, using standard form, describing the relevance of dinosaur (and other scientific) research to them personally.

Essay Exercise: Why is Dinosaur Research important to Me?
Based on what you've experienced in class today, please write an essay describing why dinosaur research, or any other scientific research for that matter, is important to you personally. The essay should be at least half a page long and follow standard form. Be ready to hand in your essay at the beginning of our next class for a daily grade.

The essay is due at the beginning of the next class period and will be graded as Pass/Fail, based on how well instructions were followed.

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Presentation Notes

The presentation notes provide a printed reference of the PowerPoint presentation slides, along with a suggested script. Select slides may be copied and distributed as class notes or the entire set may be provided to students for make-up and/or review.

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Presentation Disks

This Virtual Field Trip is provided on a Zip Disk that includes the PowerPoint Show, PowerPoint Viewer, original PowerPoint presentation archive, and other related files.

To conserve hard disk space, it is recommended that the presentation be installed on a central server if it is to be accessed by several users.

Installing the Presentation

The PowerPoint Pack and Go Wizard has been used to package the presentation to run a slide show on another computer. The wizard packages together, on a disk, all the files and fonts used in the presentation.

To unpack a presentation to run on another computer:

1. Insert *Presentation Disk 1*.
2. In Windows Explorer, go to the appropriate disk and double-click *Pngsetup*.
3. Enter the destination to which you want to copy the presentation. You will be prompted to insert additional disk(s) as necessary.
4. To run the slide show, double-click the PowerPoint Viewer (*Ppview32*) and then click the presentation you want to run.

The PowerPoint Viewer

The PowerPoint Viewer is a program used to run slide shows on computers that don't have PowerPoint installed. You can add the Viewer to the same disk as a presentation by using the Pack and Go Wizard. Then you can unpack the Viewer and presentation together and run the slide show on another computer. You can also create a play list to use with the Viewer so you can run multiple presentations, one after another.

The Viewer that comes with PowerPoint 97 supports all PowerPoint 95 features and can be used with both PowerPoint for Windows and the Macintosh.

Zip Disk Label: