Microzine ®

The Learning Library on Disk

40

The Great Pawnee Buffalo Hunt • Reading/Social Studies

Exploring Animal Adaptations • Science

Math Mall • Weights/Measures

The Case of the Destroyed Dunker • Problem Solving/Visual Discrimination

Apple® II family; 128K;
5.25-inch disk drive;
printer optional

Ages 9 and up

Microzine

Student Handbook and Teacher's Guide

40

The Great Pawnee Buffalo Hunt • Reading/Social Studies

Exploring Animal Adaptations • Science

Math Mall • Weights/Measures

The Case of the Destroyed Dunker • Problem Solving/Visual Discrimination

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Getting Started

Equipment You Need

APPLE COMPUTERS

1. Monitor or TV
2. 128K Apple ® IIe, IIc, IIc Plus, or IIGS
3. Disk drive

MS-DOS COMPUTERS

1. Monitor or TV
2. 256K IBM® with a color graphics adapter (CGA), Tandy® 1000, or any true compatible
3. Disk drive
4. Disk Operating System (DOS), version 2.0 or higher

Making Legal Copies of *Microzine*

The disks in this package are fully protected by copyright law. It is against the law to copy or in any way duplicate these disks or any portion of the program except under the terms expressly stated in these instructions and in Scholastic's Software License and Limited Warranty Agreement.

The disks included in the *Microzine* package are Archival disks. Follow the instructions for using the Archival disks to make Legal Copies. For a complete description of your rights and responsibilities in copying disks and using the program, see the Scholastic Software License and Limited Warranty Agreement included in your *Microzine* package.

You must make a Legal Copy of each Archival disk. You may not use the Archival disks for running the program. Use the Legal Copies instead.

To make Legal Copies of the Archival disks, follow these instructions:

1. Use any standard copy program or function to copy the entire contents of each Archival disk onto one blank formatted disk. If you are copying the Apple version of the program, use the Copy a Disk function of your ProDOS ® System Disk or a commercial disk copying program. If you are copying the MS-DOS® version of the program, use the DOS DISKCOPY command or a commercial disk copying program.

NOTE: Be sure to copy the complete contents of each disk. If the label on the Archival disk indicates that it is double-sided, be sure to copy both sides. Do not change any directory or file names.

2. Your package includes Legal Copy disk labels. Use a soft-tipped marker to write the serial number from the enclosed Software License and Limited Warranty Agreement in the space provided on each disk label.

3. Affix the appropriate Legal Copy disk label to each of the copies that you created in Step 1.

4. Store the Archival disks in a safe place with a copy of the Software License and Warranty Agreement.

If a Legal Copy becomes damaged or defective, first try recopying the program from the Archival disk to the Legal Copy disk. If the program still does not work, the Legal Copy disk medium itself may be defective. In this case, copy the program from the Archival disk to another disk as a temporary Legal Copy. Then send the defective Legal Copy disk to Scholastic at the following address for a free replacement. When you receive the replacement, erase the temporary Legal Copy that you made.

If an Archival disk is damaged or defective, send it to Scholastic at the following address for a free replacement:

Scholastic Software	**In Canada:**	**In Australia:**
Scholastic Inc.	Software from	Ashton Scholastic
P.O. Box 7502	Scholastic	Software
2391 E. McCarty St.	123 Newkirk Rd.	P.O. Box 579
Jefferson City, MO	Richmond Hill,	Gosford, N.S.W. 2250
65102	Ontario	Australia
	Canada L4C 3G5	

Loading the Apple Version of *Microzine*

1. Open the disk drive door.

2. Hold the disk with the label end facing you.

3. If you have a 3.5-inch disk, insert the disk slowly with the label facing up. If you have a 5.25-inch disk and the program you want is on Side 1 of the disk, insert the disk slowly with the label facing up. If the program you want is on Side 2 of the disk, insert the disk slowly with the label facing down.

4. Close the drive door.

5. Turn on the computer and monitor (or TV).

NOTE: Never remove or insert a disk while the disk drive's red light is on.

Loading the MS-DOS Version of *Microzine*
You must load DOS into your computer before you can load *Microzine*.

1. If you have a hard drive, turn on the computer.

   If you have DOS on a 5.25-inch disk or on a 3.5-inch disk, open the drive door and insert the disk. Turn on the computer.

2. You will see a DOS prompt. The prompt will be a letter followed by a greater-than sign (A>, for example). The letter of the prompt corresponds with the disk drive.

3. If you want to load *Microzine* in the drive that corresponds with the letter of the prompt (for example, if the DOS prompt is A> and you want to load *Microzine* into drive A), put the *Microzine* disk in that drive.

If you want to load *Microzine* in a drive that is different from the drive indicated by the DOS prompt (for example, the prompt is A> and you want to load *Microzine* in drive B), type the letter of the drive and a colon, then press Enter (for example, B:, then Enter). You will see a new DOS prompt (for example, B>). Put the *Microzine* disk in the drive.

Loading the Programs

Choose a program you want to load. Find the disk with that program's name on the label, and put the disk into the disk drive. Type these commands to load the *Microzine* programs:

Microzine **Guide:** Type **MZ** and then press Enter.

The Great Pawnee Buffalo Hunt: Type **TGPBH** and then press Enter.

Exploring Animal Adaptations: Type **EAA** and then press Enter.

Math Mall: Type **MM** and then press Enter.

The Case of the Destroyed Dunker: Type **TCOTDD** and then press Enter.

If the *Microzine* program you want does not appear on the screen, read the instructions once more, and try again.

NOTE: In both the Apple and MS-DOS versions of Microzine, *you may load the* Microzine *programs from within the* Microzine *Guide. Choose PROGRAMS and then choose the* Microzine *program you want to load. Choose the option Start the Program and then press Enter.*

The *Microzine* Guide

There are six features in the *Microzine* Guide. They are Programs, Computer Stuff, Credits, Letters, Hand, and Exit. The features are listed in a collection of boxes on the screen. Each box is labeled.

Use the Hand icon to point to the box that describes what you want to do. For example, to read the Credits, use the Hand to point to the box labeled Credits, and then press Return or Enter.

PROGRAMS
Use the Hand to point to Programs on the *Microzine* Guide, and then press Return or Enter to read a description of the programs in this issue of *Microzine* or to load a program from this issue of *Microzine*.

COMPUTER STUFF
Use the Hand to point to Computer Stuff on the *Microzine* Guide, and then press Return or Enter to see list of the functions in Computer Stuff. (See Computer Stuff, page 25.)

CREDITS
Use the Hand to point to Credits on the *Microzine* Guide, and then press Return or Enter to see the credits for this issue of *Microzine*.

LETTERS
Use the Hand to point to Letters on the *Microzine* Guide, and then press Return or Enter to read letters from the *Microzine* Editor and *Microzine* readers.

HAND TUTORIAL
Use the Hand to point to Hand Tutorial on the *Microzine* Guide, (or press ?), and then press Return or Enter to learn how to use the *Microzine* Hand.

EXIT
Use the Hand to point to Exit on the *Microzine* Guide, and then press Return or Enter to quit using *Microzine*.

Troubleshooter

We have included this section in the *Microzine* handbook to help you if you run into problems using *Microzine*. Each *Microzine* program is documented in the handbook, and specific hints for using the program are included there; however, we occasionally receive calls about more general problems:

LOADING *MICROZINE*

If *Microzine* does not appear on the screen, turn off the computer. Then turn it back on and try again. Make sure the disk drive door is closed, and check to see that the disk drive is hooked up correctly.

APPLE IIc PLUS

Microzine programs run most effectively when the Apple IIc Plus is running in slow mode, rather than fast mode. Put the *Microzine* disk in the drive. Hold down the Open Apple key, the Control key, the Reset key, and the Esc key simultaneously, then release all four keys. The computer will reboot the *Microzine* program in slow mode.

THE GREAT PAWNEE BUFFALO HUNT

A Twistaplot™ Adventure

You're a member of a Pawnee Native American tribe, living on the Great Plains in the 18th century. Today's the day of your first buffalo hunt.

You and your best friend, Tiny Dog, set off on the hunt with the rest of your tribe's hunting party. When you realize that you've left your tepee behind, the two of you race back to the village. When you finally get back on the trail, you've lost the hunting party. You'll have to search the Great Plains far and wide to find the hunting party . . . and the buffalo.

What You Will Find
You will meet different Native American tribes. You will also have to defend yourself against the elements of nature. Each time you meet a new tribe, you will have to identify the tribe before you can visit with its members. You will need to make wise decisions when dealing with members of other tribes. You will be rewarded for making the right decisions. The wrong decisions may prevent you from continuing on the hunt.

Once you prove your ability to survive the dangers of the Great Plains, and if you are properly prepared, you will have the honor of shooting the first buffalo for your tribe.

Riding Your Horse Through the Great Plains

Use the arrow keys to ride from one place to another. Ride to any place marked with an "X," then press Return or Enter to enter a village or camp.

PRESS   TO

↑	Walk up, or north.
↓	Walk down, or south.
→	Walk right, or east.
←	Walk left, or west.

The Pawnee Creed

The Pawnee Creed is the set of rules by which your tribe lives. The Creed will help you to make the right decisions.

To use the Creed, type **CREED**, then press Return or Enter.

Notes

Your Notes contain information about the tribes you will meet on your way to the buffalo hunting grounds. Use them when you need to identify a tribe.

To use your Notes, type **NOTES**, then press Return or Enter.

The program will ask you if you want to READ about a specific tribe or SEARCH the categories of information. Type **READ** or **SEARCH**, then press Return or Enter.

READ: Choose this option to read about a tribe. The program will display a list of tribes about which you may read. Use the ↑ and ↓ arrow keys to highlight your choice, then press Return or Enter to read about the tribe you chose. Press Esc to back up.

SEARCH: Choose this option to search through eight categories of information. You may choose to search for information about Type of Settlement, Language Group, Location, Food Sources, Transportation, Lodging Type, Tribe Size, or Characteristics. Use the ↑ and ↓ arrow keys to select a category, then press Return or Enter.

```
                         NOTES
    Which categories do you want to search?

                               ▐ Entries: 7 ▌

    ▐TYPE OF SETTLEMENT:▌
    LANGUAGE GROUP:
    LOCATION:
    FOOD SOURCES:
    TRANSPORTATION:
    LODGING TYPE:
    TRIBE SIZE:
    CHARACTERISTICS:


    VIEW ENTRIES



    Use the arrows to highlight a category,
              then press RETURN.
     Choose VIEW ENTRIES when you are done
              choosing categories.
```

When you select a category, the program will display a list of subcategories. (For example, under Food Sources you will find the subcategories Farming, Gathering, and Hunting.) Use the ↑ and ↓ arrow keys to select a subcategory, then press Return or Enter. The program will then return you to the Search the Categories screen, where it will tell you how many tribes fall into the subcategory you selected.

NOTE: If you choose to search the Characteristics category, the program will ask you to type in a word or phrase you would like to find. Enter the text you would like to find, then press Return or Enter. The program will then return to the Search the Categories screen.

You may choose to search as many of the eight categories as you wish. When you have finished choosing categories and subcategories, choose View Entries. The program will display a list of the tribes which fall into the subcategories you selected. Use the ↑ and ↓ arrow keys to select the tribe about which you would like to read, then press Return or Enter.

Supplies

Before you set off on the hunt, you will choose six items to bring with you. As you choose your supplies, you may press **D** to see a description of each item. Choose your supplies carefully so that you will be well prepared for any situation you may encounter.

While on the hunt, you may type **SUPPLIES** to see a list of the supplies you are carrying. On the Supplies screen you may press **D** to see a description of each item.

Press C for Commands

Press **C** to use a command on a screen where you don't see an input bar. The program will then ask you to type the command you want. You may type **CREED, NOTES, SUPPLIES,** or **?.**

Press ? for Help

Press **?** to see a list of the commands you may use.

Helpful Hints

Here are a few hints to help you play *The Great Pawnee Buffalo Hunt:*

• Pay attention to what Spotted Wolf tells you before you leave for the hunt. His suggestions will help you throughout your journey.

• Refer to the Creed often. You'll gain wisdom from it that will help you when you encounter a difficult situation.

• You will not be able to find your tribe's hunting party—and the buffalo— until you visit each tribe (marked by an "X") on the Plains.

EXPLORING ANIMAL ADAPTATIONS
A Science Simulation

What You Will Find

Over time, animals develop certain characteristics (like spots on their skin or sharp claws) that help them to survive. These characteristics are called adaptations. In this program, you will simulate an actual laboratory experiment to test an adaptation. You will determine the value to moths of developing (adapting) markings on their wings that look like eyes (eyespots).

In this experiment, you will see if eyespots keep a bird from eating a worm. (It's a lot easier for scientists to do this experiment with worms which can't fly away, than with moths, which can!) Then you will compare eyespots with other patterns. Find out which pattern scares the birds more often and is the more successful adaptation.

MAIN MENU

On the *Exploring Animal Adaptations* MAIN MENU, there are two options you may choose. Choose to See Instructions, or Start Experiment.

See Instructions

Choose this option to read instructions on how to conduct your experiment.

Start Experiment

Choose this option to begin your experiment. To complete your experiment, you must Choose a Pattern, Make Your Hypothesis, Test Your Hypothesis, Compare Your Results, and Evaluate Your Hypothesis.

Choose a Pattern: There are five patterns you may compare to eyespots. Choose the pattern you think will scare the bird the most.

Press Space Bar to highlight your choice, then press Return or Enter.

Make Your Hypothesis: Once you've selected a pattern to compare with eyespots, the program will ask, "Which pattern do you think will scare the birds more often?" Press Space Bar to highlight your choice, then press Return or Enter.

Test Your Hypothesis: First test the eyespot pattern. Press ← to release a bird. The bird will approach the worm with the eyespot pattern. The bird will either eat it, pause and then eat it, or pause and fly away. The program will use a stopwatch to record how much time the bird takes before eating the worm or flying away. Use the Space Bar to highlight the correct time on the stopwatch, then press Return or Enter.
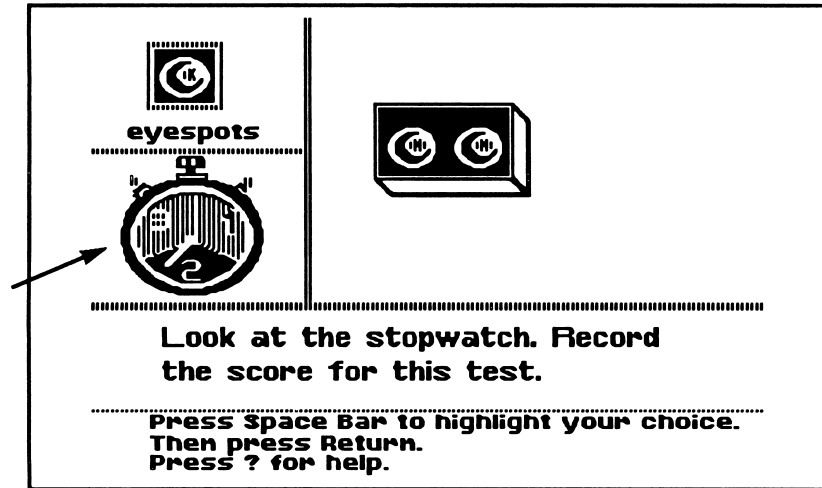
Once you've tested the eyespot pattern five times, the program will ask you to add up the total amount of time the bird spent before eating the worm or flying away.

You may then follow the same steps to test the pattern you chose.

Compare Your Results: After testing both patterns, look at the results. The pattern with the highest score is the more successful adaptation.

Evaluate Your Hypothesis: The program will remind you of your hypothesis, and ask if you were right. Use the Space Bar to select Yes or No, then press Return or Enter.

You may then compare another pattern to the eyespots.

MATH
MALL
A Math Feature

What You Will Find

You will work in a mall where customers shop for toy train track, board their pets, and take piano lessons. At The Right Track, customers will order lengths of track in meters. At All A-Boarding Kennels, customers will board their dogs for a certain number of days and/or weeks. Customers will decide how many piano lessons they can afford to take at Lester's Lesson Center.

In each shop you'll use different measures of length or time to fill the customers' orders.

How the Game Works

You are in charge of all the shops in the *Math Mall*. It's a busy mall, with a steady flow of new customers. Since you're the only salesperson, you will have to serve as many customers as you can in each shop. You must work quickly to avoid losing customers. If too many customers are kept waiting in a store, they will leave the mall.

You may enter The Right Track, All A-Boarding Kennels, or Lester's
Lesson Center.

Customers Served
At the top left corner of the screen you will see how many customers you
have served in the *Math Mall*.

Customers Lost
At the top right corner of the screen you will see how many customers
left the *Math Mall* since the game began.

Moving in the *Math Mall*
Use the → and ← arrow keys to walk between the shops.

Entering a Shop
To enter a shop in the *Math Mall*, walk to the shop door, then press
Space Bar.

When you enter a shop for the first time, you will have two options. You
may press I to read the instructions or you may press S to start working.

Press I to Read Instructions

Press I the first time you enter each shop. Read the on-screen instructions to learn how to fill customers' orders in that shop. Remember, each shop works differently.

Press S to Start Working

Fill each customer's order as quickly as you can. Use the ←, →, ↑, and ↓ arrow keys to move the blinking arrow to choose between the different options in each shop.

Exiting a Shop

Press Esc to leave the shop in which you are working. The Mall screen will appear and you may visit another shop.

Warning Messages

As you are working, customers will enter and leave the mall. When this happens, warning messages will appear on the screen and interrupt your sale. For example, when there are eight customers waiting at The Right Track, you will see the message, "CROWD ALERT: There are 8 customers waiting at The Right Track." The message will disappear as soon as you use the arrows, Return, or Enter.

You may either go to the shop the warning message tells you about, or you may continue working where you are.

Ending the Game

Customers will leave the *Math Mall* when the shop in which they are waiting becomes overcrowded. When the tenth customer enters a shop, all the customers in the shop will leave.

No matter how fast you work, some shops will eventually become overcrowded and you will lose customers. But don't worry. New customers will enter the mall. With so many customers to serve, there will always be someone else who needs your help.

The game is over when 50 customers leave the *Math Mall*. The program will tell you how many customers you served in each shop.

Tips on Playing *Math Mall*

• Enter the most crowded shops first.

• If more than one shop has eight or more customers in line, enter the shop nearest you first. This way, you will save time walking around the mall. Every second counts!

• Serve at least a few of the customers in each shop. The first customers in each shop are the easiest ones to serve. Even if you only serve three customers, you will delay overcrowding. This will give you more time to work in the other shops.

• You will never lose customers from the shop in which you are working. You can take your time and serve all the customers in the shop.

• Use a pencil and paper to help you figure out how to serve the customers in each shop. This may slow you down at first, but it will be worth it.

THE CASE OF
THE DESTROYED
DUNKER

A Monitor
Mystery
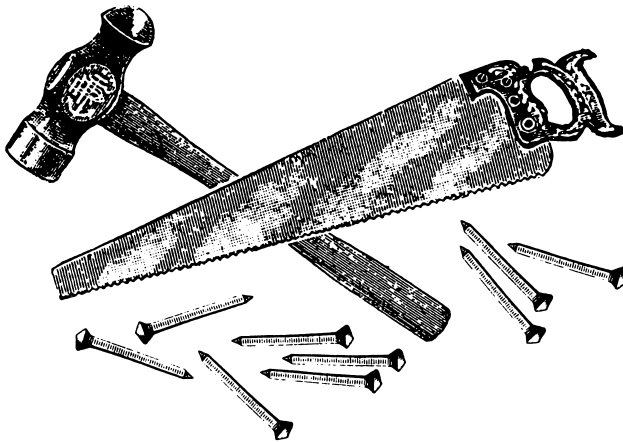
We at the *Microzine* Mystery Society used our powers of observation and logic to deduce that you would be playing the Monitor Mystery today. Last night one of our agents secretly turned your everyday computer into a Sherlock 221B Mystery-Solving Computer! Can the two of you work together to solve this case?

What You Will Find
You will read a Story, look at a Picture, and then answer Questions to solve *The Case of the Destroyed Dunker*.

Monitor Mystery MAIN MENU
Monitor Mystery has two functions or things you may do. They are Instructions and *The Case of the Destroyed Dunker*.

Choose Instructions to learn how to solve this Monitor Mystery.

Choose *The Case of the Destroyed Dunker* to play. The mystery is divided into three parts: the Story, the Picture, and the Questions.

The Story
Read the Story to learn the facts you will need to answer the Questions.

On the Story screens, you may type **P** to see the Picture, or type **Q** to answer the Questions.

The Picture
Study the Picture and search it for clues. A magnifying glass will appear. Use the arrow keys to move the magnifying glass over every object in the picture, and then press Return or Enter. Clues will appear at the bottom of the screen.

On the Picture screen, you may type **S** to read the Story, or type **Q** to answer the Questions.

The Questions
Answer the Questions to solve *The Case of the Destroyed Dunker*. Your 221B computer will tell you if all your answers are correct.

If one or more of your answers are wrong, your 221B computer will ask you to type in the number of the answer you want to change. When all your answers are correct, your 221B computer will ask you one final question.

On the Question screen, you may type **S** to read the Story, or type **P** to see the Picture.

Final Question
Answer the final question to solve the mystery. If your answer is wrong, your 221B computer will ask you if you want to try to answer the final question again. Type **Y** for yes or **N** for no.

When you answer the final question correctly, your 221B computer will ask if you want to compare your answers with its answers. Type **Y** for yes or **N** for no.

Microzine Mystery Society Mystery-Solving Tips

• A smart sleuth reads the Story carefully to learn all the facts.

• An inventive investigator checks each object in the Picture for clues.

• If the 221B computer says that at least one answer is wrong, a daring detective carefully reexamines each answer to make sure an "obviously" right answer is not, in fact, dead wrong!

• After answering the final question correctly, a magnificent mystery-solver always compares deductions with the 221B computer to see how logical minds think alike.

COMPUTER STUFF
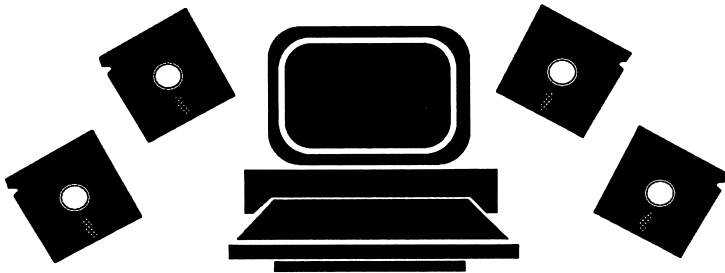
What You Will Find

Choose Computer Stuff on the *Microzine* Guide to initialize a data disk.

A data disk is a blank disk (or one that you don't mind erasing) that has been initialized, or formatted. Initializing a disk gets it ready to save your data for *Microzine*.

Apple: To initialize a data disk, use the Hand to choose Initialize a Disk and then press Return. Follow the on-screen instructions.

The program will initialize the disk. Then the Computer Stuff list of functions will appear. You now have a data disk. You may use it for any *Microzine* feature that requires a data disk.

NOTE: You will not need a data disk with any program in this issue of Microzine.

MS-DOS: Use any MS-DOS format utility to format or initialize a disk.

NOTE: Issues 1-26 of Microzine require a DOS 3.3 data disk. Beginning with issue 27, each issue of Microzine that requires a data disk will require a ProDOS data disk for Apple computers or an MS-DOS data disk for MS-DOS computers.

MICROZINE
SCOPE &
SEQUENCE

CRITICAL THINKING SKILLS

	THE GREAT PAWNEE BUFFALO HUNT	EXPLORING ANIMAL ADAPTATIONS	MATH MALL	THE CASE OF THE DESTROYED DUNKER
Comparing/Classifying	•	•	•	
Sequencing	•			•
Analyzing	•	•	•	•
Inferring	•	•		•

CURRICULUM AREAS

	THE GREAT PAWNEE BUFFALO HUNT	EXPLORING ANIMAL ADAPTATIONS	MATH MALL	THE CASE OF THE DESTROYED DUNKER
Reading/Language Arts	•			•
Math/Problem Solving			•	•
Science		•		
Social Studies	•			

INFORMATION PROCESSING SKILLS

	THE GREAT PAWNEE BUFFALO HUNT	EXPLORING ANIMAL ADAPTATIONS	MATH MALL	THE CASE OF THE DESTROYED DUNKER
Word Processing/Publishing				
Database/Research	•	•		
Maps/Charts/Graphs	•	•		
Visual Discrimination		•		•

THE GREAT PAWNEE BUFFALO HUNT

Vocabulary Preview: buffalo hides, bullboat, carcass, creed, emerge, ignite, lance, moccasins, nomadic, panic, pemmican, rawhide, settlement, tepee, warrior

Learning Objective: Students will be able to apply critical thinking strategies as they work in a collaborative learning environment.

Synopsis

In *The Great Pawnee Buffalo Hunt*, it is the 18th century, before white settlers have come to the Great Plains of North America. The student is a member of a Pawnee tribe. The Twistaplot begins on the morning of the student's first buffalo hunt. Due to carelessness, the student and his/her best friend, Tiny Dog, are left behind. Students will have to track and catch up with the hunting party. Along the way, they'll meet other tribes of the Great Plains. Students' ability to select and maintain the supplies necessary for survival and to adhere to the Pawnee Creed will determine whether or not their meetings with the other tribes end successfully, allowing them to eventually join the hunting party.

Lesson 1: A Warm-up Activity

TEACHER INSTRUCTIONS

To successfully complete this Twistaplot, students must be able to discriminate between supplies that are vital for survival and those that are not. The following warm-up activity will prepare students for this critical thinking challenge.

Ask each student to make a list of ten items he or she uses every day. Tell students to use general terms to describe specific types of items (for example, students should include on their lists "food," rather than "cereal"; "video games" rather than "Super Mario Brothers"). Once students have completed their lists, have them rank the items in order of their importance, one being the most important, and ten being the least important. Have students compare their ranked lists. Discuss differences among the lists. Ask students, "What criteria did you consider when ranking the items on your list?"

Elicit from students that the most important items on their lists should be those necessary for survival (for example, food), and the least important items should be those that are luxuries (for example, video games). Once they understand the distinction between necessity and luxury, have students revise their lists and their rankings.

Next, ask students to imagine that they are members of a Native American tribe living on the Great Plains 200 years ago. Have students suggest items they might use every day and list them on the chalkboard or overhead projector. Students should now be ready to use the program.

Lesson 2: A Follow-up Activity

TEACHER INSTRUCTIONS
After playing *The Great Pawnee Buffalo Hunt*, students will have an understanding of the Native American life-style before the intervention of European settlers. They will also have had a chance to apply that knowledge in a role-playing situation. The object of this lesson is to allow students to expand their knowledge of Native Americans and build upon their understanding of the Native American life-style.

In the role-playing activity that follows, students will conduct research on Native American tribes and apply that research by planning a hunting expedition.

Divide the class into groups of four and have each group select a Native American tribe to research. (Students should feel free to select a tribe presented in the Twistaplot, but encourage them to select a tribe from another region of North America, such as the Pacific Northwest, the Southeast, or Northeastern Woodlands.) Ask students to imagine that they are members of the tribe they select, and that they are about to embark on a hunting expedition in their native region. Have the groups conduct research to learn about the customs and life-style of their tribe, and the habitat in which the tribe lived. Encourage students to work collaboratively, and have each member of the group fill one of the following roles:

Chief Hunter: This student will be responsible for selecting the objective of the hunt (should students hunt buffalo, salmon, deer, etc.). He or she should describe and draw pictures of the weapons needed to complete the hunt and the tools needed to make use of the kill (for example, knives to skin the animal, materials to tan the hide, etc.). The Chief Hunter will also determine the probable length of the expedition.

Scout: This student will be in charge of drawing a map of the tribe's native region. He or she should make note of natural resources in the area (woods, rivers, lakes, etc.), the climate, and the likely location of prey. The Scout will also be also responsible for plotting the course of the expedition based upon the Chief Hunter's choice of prey.

Ambassador: This student will be responsible for identifying other Native American tribes that are likely to be encountered on the expedition. He or she should prepare a chart similar to the one in the "Notes" section of the Twistaplot, which describes the characteristics of the tribes. The Ambassador should also have a list of responses tribe members might use when encountering the other tribes.

Supply Chief: This student will be responsible for selecting and listing all supplies necessary for the hunt. The Supply Chief must work closely with all the other members of the group in order to determine what will be needed on the hunt. He or she must consider which materials are available to the tribe and remember that supplies will be limited by what the expedition members can carry. He or she should then make a complete list of the supplies needed.

Once the groups have completed their research, have them compile their work into one report. Encourage them to think of creative ways in which to present their work (for example, by decorating the report binder with art styles of their tribe).

TEACHER TIPS

• This project will require a lot of research and imagination. When dividing the class, be sure to include students with different strengths and skills in each group.

• If your students are more advanced, have the groups prepare oral presentations in addition to the written reports. To further extend their experiences, suggest that students prepare native foods and wear native dress.

Hints on Playing *The Great Pawnee Buffalo Hunt*:

The nomadic tribe which lives in the tepees by the stream and has fast horses is the **KIOWA** tribe. Trade for the Kiowa horse.

The tribe which swims, lives in earth lodges, has corn fields, and uses "strange-looking, round" boats is the **ARIKARA** tribe. Give First Moon a present.

The large nomadic tribe with hundreds of tepees at the bottom of the hill is the **SIOUX** tribe. Don't fight the Sioux.

The man lying on the ground who has long fringes on his leggings is a **COMANCHE**. Help the Comanche.

The warrior in the white buffalo robe with white paint on his face is an **ARAPAHOE** Coyote Man. "Count Coup" with the Arapahoe.

The children playing the hoop and pole game are **HIDATSAS**. Don't pretend to lose against the Hidatsas.

The answers to Spotted Wolf's questions are as follows:

The **ARIKARA** tribe uses bullboats, has excellent swimmers, speaks a Caddoan language, and has settlements in Nebraska.

The **SIOUX** tribe is the largest on the Plains, is nomadic, and lives in Montana and Nebraska.

The **HIDATSA** tribe uses horses and bullboats, plays a game with hoops and poles, and speaks a Siouan language.

The **ARAPAHOE** tribe lives in Wyoming and Colorado, has Coyote Men, and speaks an Algonquin language.

The **COMANCHE** tribe is nomadic, lives in Texas and Oklahoma, dresses in leggings with long fringes, and has more than 5,000 members.

The **KIOWA** tribe is nomadic, has fewer than 5,000 members, is known for breeding fast horses, and speaks a Shoshonean language.

EXPLORING ANIMAL ADAPTATIONS
Lesson Plans

Vocabulary Preview: adaptation, eyespots, trait, extinct, predator, prey, species

Learning Objective: Students will compare data to test hypotheses about successful adaptations and survival in moths.

In *Exploring Animal Adaptations* students analyze wing patterns among moths and determine which pattern is most effective for survival. Using the program, children test wing eyespots against other patterns: thin crosses, thick crosses, circles, double circles, and lines. After formulating a hypothesis about which pattern will scare birds more often, the selected pattern is tested in five experimental "samples." As scientists, students release a bird (predator) near a moth-model (prey). (The moth-model is a worm with the test pattern next to it.) Then students record the amount of time it takes the bird to:

• Eat the moth-model (least amount of time).

• Wait before eating the moth-model (moderate amount of time).

• Avoid the moth-model (greatest amount of time).

The hypothesis is verified or refuted by comparing the test results for the two patterns. The one with the higher score is the more successful adaptation.

This controlled experiment is based on an actual laboratory experiment. In it, scientists put a pattern on both sides of a dead worm (to simulate a moth and its wings). They put a light under the worm. Then they released a bird. As the bird flew to eat the worm, the scientists turned on the light so the bird could see the pattern. The scientists recorded whether or not the pattern scared the bird. They did this many times with many different patterns.

Lesson 1: A Warm-up Activity

TEACHER INSTRUCTIONS

Most students have a fair amount of prior knowledge about nature's food chains and predator/prey relationships. To assess their prior knowledge of adaptation, ask students, "What do you think would happen to cats if they no longer had claws?" (They wouldn't be able to escape predators and could become extinct over a long period of time.) Tell students that many animals have traits that help them to avoid being eaten by predators. These traits are called adaptations.

Make a chart on the chalkboard or overhead projector. DO NOT INCLUDE THE SUGGESTED TRAITS SHOWN. Can students suggest the trait that helps each animal survive?

ANIMAL	TRAIT(S) / ADAPTATIONS
cat	uses claws to climb/escape
chameleon	can turn camouflage colors to hide
skunk	sprays musky "aroma" to offend
porcupine	raises prickly spines to protect
blowfish	inflates body to startle
turtle	hides in protective shell to escape

Have students think about variations in an animal's adaptation by asking several questions:

• How would each animal be endangered if its survival trait changed? (Possible extinction or drastic change in habitat/living pattern.)

• What would happen if some animals of a species were able to keep their survival trait and some animals lost it? (Those with the trait would survive and the others would die.)

• How would it affect the species over time? (Those with the survival trait would pass it along to their offspring and all the others would eventually die, a concept called "survival of the fittest.")

Lesson 2: Use With Students Before and While Using *Exploring Animal Adaptations*

TEACHER INSTRUCTIONS

This program allows students to explore the adaptation of moths through a simulation of a controlled experiment. Using the program, students formulate several hypotheses about wing patterns and successful adaptations. The following blackline master helps students to collect and organize data provided by the program. Additionally, students are encouraged to further analyze the data patterns to suggest possible reasons for the recorded behaviors.

Before distributing the blackline master, tell students that some moths have a trait that often keeps them from being eaten by birds. Can they guess what it is? (Eyespots are eye-like markings on their wings that scare birds.)

Distribute the blackline master. Tell students they will use it to collect data from several experiments. The experiments will explore the effectiveness of moth wing patterns in scaring away birds that want to eat the moths. The students can compare five different patterns to an eyespot pattern. Introduce the program and complete one experiment by testing a pattern. Make sure that students understand how and why the hypothesis was formulated. Have students complete the tests for the remaining patterns.

TEACHER TIPS

• Check your school or local library for picture books about butterflies and moths. Actual photos or illustrations of eyespots may be interesting to your students.

• Data collected on the blackline master will be used in the post-activity. Remind students to keep their papers or collect them for later use.

EXPLORER'S LOG

Use the following log to record the data you collect as you use *Exploring Animal Adaptations.*

Draw the Pattern Tested	Write Your Hyphothesis Here	Eyespot Score	Pattern Score	Was Your Hypothesis Right?

Lesson 3: Use With Students After Completing Lesson 2

TEACHER INSTRUCTIONS

Have students look at their completed blackline masters and ask, "Did you notice anything new in the data you collected? (Let them make suggestions but do not confirm anything!) Have students examine the data and suggest reasons why the birds reacted the way they did. Draw the following chart on the chalkboard or overhead projector. With students, fill in the data collected for each pattern.

LEAST EFFECTIVE	0-5 Total	6-8 Total	9-11 Total	12-15 Total	MOST EFFECTIVE

Ask students, "Which patterns were least effective in scaring away birds?" Have volunteers draw the least effective pattern(s) on the diagram. For example, if the recorded data for "thick crosses" totalled 8, a student would draw a thick cross underneath the 6-8 section on the diagram. Then ask, "Which patterns were the most effective?" Again, have volunteers draw the patterns at the appropriate places on the diagram.

Once all the patterns are drawn, have students suggest reasons why some patterns were more effective than others. (The circle patterns were more effective because they more closely resembled eyespots.) Was any one pattern the least effective? (Answers will vary based on collected data.) If the experiments were conducted again, would the data be dramatically different? (Probably not.) Why? (Birds seem to react the same way to the same shapes.)

Have students suggest other shapes or traits that might be effective in scaring birds (triangles, squares, hexagons, stars, spirals, etc.). Discuss which ones might be the most effective and suggest reasons.

MATH MALL

Lesson Plans

Vocabulary Preview: centimeters, lengths, meters

Learning Objective: Students will be able to find and compute equivalent units of time and measures of distance.

In *Math Mall*, students will solve problems using measures of time (days and weeks, hours and minutes) and measures of length (meters and centimeters). Students will be given a selection of measures and a "target" measure. They then must determine the correct combination of the given measures to equal the target measure. The problems require estimation and two-step problem-solving techniques. Students must also apply their prior knowledge of factors.

Lesson 1: A Warm-up Activity

TEACHER INSTRUCTIONS

At All A-Boarding Kennels students will have to rename weeks as days to complete problems. Customers want to board their pets for a certain number of weeks and days. Students (the salespeople) have contracts to board pets for a fixed number of days. Students must figure out how many of the contracts they'll need to fill each customer's order. Prepare them for this skill with the following activity.

Tell students that they're starting a travel agency. Invent a name for the agency (for example, "Math-Tours") and write it on the chalkboard or overhead projector, along with names of several locations around the world. Assign each location a different period of time to represent the length of stay at that place in weeks and days (for example, Jamaica: 2 weeks, 5 days; Paris: 4 weeks, 2 days; etc.). Explain that the locations and lengths of stays are package tours that your agency offers. Have volunteers choose a package tour. Then have them figure out how many days of school they'll miss if they leave on the vacation tomorrow.

Discuss with students how many steps this computation will require. (Two steps.) First students must determine the total number of days of the tour by multiplying the number of weeks by seven, and adding the sum to the remaining number of days. (For example, a tour that is 2 weeks, 5 days equals 19 days.) Second, students must determine the number of school days that occur during that period. Suggest to students that they compute the answer by determining the number of days that school would NOT be held during that period due to weekends and holidays. The number of school days missed will vary depending on the day the tour starts. Have students compare a tour beginning on Monday to one beginning on Saturday.

Once students feel comfortable renaming weeks as days, have them begin using the *Math Mall* program.

TEACHER TIP

- If students have trouble with the second problem-solving step in the All A-Boarding Kennels shop, review the concept of factors with them.

  Discuss with students how the number of days in the correct contract will always be a factor of the number of days in the requested stay at the kennel. Once the correct contract is determined, students must then find the factor that equals the requested stay at the kennel when it is multiplied by the number of days in the contract.

Lesson 2: A Warm-up Activity

TEACHER INSTRUCTIONS
At The Right Track, customers order a certain length of toy train track in meters and centimeters. Students (the salespeople) have specific lengths of track available. Students must figure out how many pieces of the track they'll need to fill each customer's order. Prepare students for the type of renaming required at The Right Track with the following activity.

On the chalkboard or overhead projector, draw and label three pieces of toy train track with the following: 10 cm, 25 cm, and 40 cm. Tell students you have one section of each length of track. Ask students, "What is the greatest length you can make by joining any two of the sections?" (65 cm) Ask students, "What is the shortest length you can make with two sections?" (35 cm)

Next, tell students that you have nine pieces of each section available. Ask, "What is the greatest length you can make by joining ten of the sections?" (385 cm) Have the student who solves this problem write the equation he or she used on the chalkboard. ([9 x 40 cm] + 1 x [25 cm] = 385 cm)

Now have students rename this distance in meters. (100 cm = 1 meter, so 385 cm = 3 m 85 cm)

Continue practicing this skill by asking, "What is the shortest length you can make by joining ten of the sections?" ([9 x 10 cm] + [1 x 25 cm] = 115 100 cm = 1 meter, so 115 cm = 1 m 15 cm)

TEACHER TIPS

• If students have trouble quickly solving problems at The Right Track, explain to students that the sections of track are measured using the metric system, which is base ten, and therefore easy to compute. Ask students, "How many centimeters are there in 1 meter?" (100) Then ask, "How many 10 centimeter sections are there in 1 meter?" (10) Ask students, "How many 25 centimeter sections are there in 1 meter?" (4)

Advise students to create a table of equivalent measures for quick reference:

    1 m = 100 cm
    1 m = ten 10 cm sections
    1 m = four 25 cm sections

• Some of the lengths ordered will have a five in the ones place. Point out to students that to fill the customer's order they'll have to use the 25 cm length (and possibly others) because it is the only length with a five in the ones place.

Lesson 3: A Warm-up Activity

TEACHER INSTRUCTIONS
At Lester's Lesson Center customers buy piano lessons by the hour. Students are told the cost per hour for lessons, and must compute how many hours of lessons the customer can have. Students will need to use estimating and guess-and-check strategies to solve these problems. Preview these strategies with the following activity.

Tell students you are thinking of taking a part-time job. Play "20 Questions" with the class by having them try to guess the job. (Giving private math lessons)

Once students have guessed the kind of part-time job you're taking, have them identify the questions that were most helpful in finding the answer. Write these on the chalkboard or overhead projector. Then ask students, "Which questions were least helpful in figuring out the type of job?" Discuss the differences between the two types of questions. Elicit that the best questions eliminated the greatest number of possible jobs. The worst questions eliminated only one or no other possible jobs.

Explain to students that the key to success in "20 Questions" is in not wildly guessing. Elicit from students that they asked questions, then examined the answer before asking another question. They were estimating the best question and making educated guesses.

Next, apply this problem-solving strategy to numbers. Tell students that you are thinking of a length of time (for example, one and a half hours). They have 20 questions in which to guess the length of time. Students should understand that the key to finding the length of time is by narrowing down the range of possible answers until the correct answer is "isolated" (for example, they might ask, Is it less than one day? More than one hour? Less than 6 hours? and so on). Once a range of possible answers is established, each question should further cut that range. Remind students that they will use this strategy in Lester's Lesson Center.

TEACHER TIPS

• Students will need to estimate and use the guess-and-check technique described above in order to solve problems in the program. If they are having trouble, suggest that students use front-end estimation in order to find the answer. For example, once students are presented with the dollar amount the customer has to spend, and the hourly rate for the lessons, they should estimate the greatest whole number that could be multiplied by the dollar figure in the hourly rate—and still be less than the amount customers have to spend.

Students should then use the guess-and-check strategy to determine the accuracy of their estimation. Tell them to estimate the number of hours amount in the answer. If the answer is too great, then they should try again using the next lowest whole number. Once the hour unit is determined, the low end of the possible range of answers is established. Students can cut the range of possible answers in half in the minutes place by first using 30 minutes—then 15 or 45, and so on, until the answer is found.

THE CASE OF THE DESTROYED DUNKER
Lesson Plans

Vocabulary Preview: balsa, destroy, deduce

Learning Objective: Students will be able to read for detail and apply critical inference skills to solve a mystery.

Lesson: Use With Students While Playing *The Case of the Destroyed Dunker*

TEACHER INSTRUCTIONS

When solving a Monitory Mystery, students must read for detail, evaluate clues found in a picture of the scene of the crime, discover important facts, and make inferences based on what they've read and seen in the picture to answer questions that will lead them to solve the mystery. This activity will give students the opportunity to develop the skill of discovering important facts. Students will then have to view the facts in relation to one another to help them to successfully complete *The Case of the Destroyed Dunker*.

Distribute the following blackline master to students while they're using the program. Have students write down all of the facts they uncover while reading the mystery and examining the scene of the crime. After they've read everything once, ask students to review the mystery and the scene of the crime. Ask them to determine whether each fact they read is relevant or not to the mystery, and then explain why in one sentence. For each relevant fact, students should write the number of other relevant facts that may be related to it.

TEACHER TIPS

- If students are having difficulty deciding which facts are relevant, help your class to define the meaning of relevance. Ask students, "If I am planning to go outside and I want to know how to dress, what clues might I look for?" (Is it sunny, rainy, snowy, windy? How are other people outside dressed? What is today's date?) Then discuss each student's response. Ask students, "Which clues are related?" (The way people are dressed is related to whether or not it's snowy — but not related to whether or not it's sunny. Therefore, knowing that it's sunny isn't a relevant fact to help decide how warmly to dress. But if it is July 1, then the fact that it's sunny is a clue that is may be warm outside.)

FACT FINDER

Use the chart below to write down all the facts you uncover in the mystery. For each fact, decide whether or not it is relevant to solving the mystery. Then list any related facts.

	FACT	RELEVANT?	RELATED FACTS
1			
2			
3			
4			
5			
6			
7			
8			

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