

VOLUME 2 • GRADES 4-6
*Animal Adaptions • Simple Machines
Nutrition • Day, Night, and the Seasons*

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SCIENCE EXPLORERS™



VOLUME 2 • GRADES 4-6

Animal Adaptations • Day, Night, and the Seasons • Simple Machines • Nutrition

SCHOLASTIC EXPLORERS LIBRARY

SCIENCE EXPLORERS

Volume Two

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WELCOME TO *SCIENCE EXPLORERS*

Welcome to the Scholastic *Science Explorers* Series! Like all programs in the Scholastic Explorers Library, *Science Explorers* approaches learning as a process of discovery guided by the young child's innate curiosity.

Children are natural explorers. They embark daily on journeys of learning launched with simple questions—Why? How? What for? *Science Explorers* provides a complete set of computer-based and hands-on activities that will help students answer many questions about the world. Moreover, these activities will hone the habits of mind that transform curiosity into scientific inquiry.

Each *Science Explorers* unit provides a rich, interactive learning environment that will motivate students to observe their world, ask questions, explore relationships, record observations, make connections, reconceptualize, and ask new questions. In short, the *Science Explorers* series engages children in the world of scientific thinking. It helps them master the scientific problem-solving skills that are essential not only to their success in school science courses, but also to their understanding of the medical, environmental, and technical issues that will inevitably influence their lives.

Your *Science Explorers* package contains four disks, each covering a different topic from the science curriculum. At the heart of each disk is an Exploration, a simulation, tool, or experiment that engages children in scientific problem-solving. These Explorations familiarize students with scientific logic and the steps of controlled experimentation. They are structured so that students can perform multiple investigations, testing a different hypothesis each time around. As students conduct their experiments, they:

- Formulate hypotheses.
- Select variables.
- Run trials.
- Measure and record results.
- Analyze results and draw conclusions.

While applying these process skills, students gain insight into significant science concepts: how animals survive; what makes the seasons; how simple machines work; what constitutes a healthy diet.

Each disk also contains two highly graphic, interactive Tutorials designed to supplement the Explorations. These optional units can be used to introduce the content area, to provide review for students who need it, or as follow-ups to the Explorations.

Sixteen Explorer's Logs (activity sheets) with corresponding lesson plans, eight At-Home Science Handouts, and four reproducible glossaries complete the *Science Explorers* package. Twelve of the Explorer's Logs are built around critical science-process skills: hypothesizing, analyzing, and measuring and recording. The remaining four present cross-curricular activities that integrate science with language arts, social studies, and art. Like the software, the Explorer's Logs encourage students to build on their prior knowledge, apply a variety of critical-thinking skills, collaborate and brainstorm with peers to develop effective problem-solving strategies, and to record and communicate their discoveries.

This Teacher's Handbook is your guide to integrating *Science Explorers* into your classroom and science curriculum. The handbook includes alternative teaching strategies, tips, hands-on activity ideas, the Explorer's Logs and other handouts, as well as information on loading and running the software.

We wish you and your students a world of successful learning adventures!

YOUR SCIENCE EXPLORERS PACKAGE

Covering the Curriculum

The *Science Explorers* series is designed to support your science teaching throughout the year. The topics were carefully chosen to span the major strands of the elementary school science curriculum. They cover concepts that are an important part of the established curriculum but are difficult to convey through traditional print media. The four topics covered in this series are:

- Life Science: Animal Adaptations
- Earth Science: Day, Night, and the Seasons
- Physical Science: Simple Machines
- Health: Nutrition

These topics were also selected because they cover familiar parts of your students' world. Explorer's Log activity sheets stimulate direct observation and hands-on experimentation that reinforce and expand the understandings students gain from the software.

Although each *Science Explorers* unit focuses on a major branch of the elementary school science curriculum, it can be easily related to a variety of science topics. Alternatively, you can use the programs *independently* of the content covered to focus your students' learning on the process skills embedded in every Exploration. How you use *Science Explorers* depends largely on your own philosophy and approach to teaching science.

The **Subject Correlation Chart** on pages 8 and 9 gives you an at-a-glance guide to what each unit covers.

TEACHING WITH SCIENCE EXPLORERS

Science Explorers combines a wide variety of teaching materials:

- Computer simulations that enable students to conduct controlled experiments that would be difficult or impossible in the real world
- Tutorials that present background material in an engaging, interactive format
- Hands-on activities that engage students in real-world experimentation

These materials will enable you to plan a complete unit of study that meets your teaching style and the needs of your class. Keep in mind that there is no single "correct" way to use *Science Explorers*—all the materials have been designed to provide you with maximum flexibility. However, you might find the following ideas helpful as you familiarize yourself with *Science Explorers* and consider how best to use the materials in your classroom.

Using the Software

Each *Science Explorers* disk provides many opportunities for students to answer questions; formulate and test hypotheses; generate, measure, and record data; and draw conclusions. Whether you use these opportunities to challenge individual students, to encourage the group problem-solving that is the hallmark of collaborative learning, to provide review for a youngster who is falling behind, or to introduce a new unit of study to your entire class depends on the goals you have set for your students. Before you can determine the most appropriate use of *Science Explorers* in your classroom, you should:

1. Familiarize yourself with the software and the accompanying teaching materials. You will need approximately 45 minutes to review each *Science Explorers* topic (see pp 81-82 for loading instructions). As you review the materials, remember that each Exploration and Tutorial can be used independently.
2. Assess your students' prior knowledge. Students bring an "everyday" understanding of science into the classroom. Their sense of how the world works may be shaped by both surprisingly accurate insights and astonishing misconceptions. Knowing what your students know and believe can help you decide how best to use *Science Explorers*. Classroom discussions are excellent tools for assessing prior knowledge. Interesting conversation starters include vocabulary words, poems or stories, and simple questions, such as "What is a simple machine?" "What makes the seasons?" Many teachers find that they are best able to elicit their students' knowledge when they play a *minimal* role in the discussion, letting students direct the conversation themselves.
3. Assess your computer resources. Clearly, the amount of computer time available will affect how you use *Science Explorers*. If time is limited, use Tutorials for whole-class presentations. The many questions in each Tutorial make excellent discussion points. The Explorations are especially appropriate for group work. By carefully teaming students with complementary strengths, you can enhance the learning experience for all.
4. Consider your broader learning objectives. If enhancing your students' skills in communication, problem-solving, and decision-making is one of your priorities, consider assigning *Science Explorers* Explorations as small-group activities. Explorations are an ideal stimulus for collaborative learning because they require students to make numerous decisions. Divide your class into Explorer Teams. Have each team assign members individual roles (e.g., notetaker, referee to resolve conflicting points of view, computer operator), but stress that students must reach consensus in order to proceed through the Exploration. Have each team report on its findings. Such an approach can develop group problem-solving skills *and* individual responsibility.

You might also consider dividing your class into pairs of "Science Partners" who can stimulate each other's learning as they work through a Tutorial or Exploration together. All students can benefit from the reinforcement and self-help that come with collaborative learning.

5. Discuss the idea of simulations. Before you use any of the Explorations, be sure that your students understand that these are simulations. Discuss other types of simulations your students may be familiar with (e.g., fire or earthquake drills; TV "docudramas" that recreate past events). Ask them whether they think scientists use computer simulations in their work and why. Help your students understand that a simulation represents a very narrow piece of reality. Encourage them to consider, for example, how the results of using a pulley or studying eyespots in the real world might differ from results generated by the computer simulation.
6. Discuss what it means to be an explorer. However you use these programs in your classroom, consider introducing the software through a class discussion of what it means to be an explorer and a scientist. Can your students name any explorers? Any scientists? What skills do they think are necessary to be a scientist or an explorer? Are these skills your students have? Are they skills they can learn? Encourage students to consider those attributes that already make them explorers and to use these as they embark on the adventures in learning that *Science Explorers* engenders.

Correlations for Scholastic Science Explorers

Recommended for Grades 1-3 | Recommended for Grades 4-6

CURRICULUM AREA	Recommended for Grades 1-3					Recommended for Grades 4-6		
	Plants	Weather	Shadows	Skeletons	Animal Adaptations	Day, Night, and the Seasons	Simple Machines	Nutrition
LIFE SCIENCE								
Plants								
Plant Growth	✓							
Plant Structure	✓							
Life Cycle	✓							
Plant Nutrition	✓							
Photosynthesis	✓							
Animals								
Body Structure				✓				✓
Vertebrates				✓				✓
Invertebrates				✓				✓
Animal Growth				✓				✓
Ecology/Evolution								
Plant Ecology	✓							
Animal Ecology	✓				✓			
Habitats	✓				✓	✓		
Evolution					✓			
Adaptation					✓			
Human Biology								
Senses								
Anatomy					✓			✓
Nutrition					✓			✓
EARTH SCIENCE								
Earth								
Earth in Space	✓		✓			✓		
Seasons	✓		✓		✓	✓		
Oceans & Weather	✓		✓			✓		
Day/Night			✓			✓		✓

Space

Sun	✓	✓	✓							✓			
Seasons		✓	✓							✓			
Day/Night		✓								✓			
Solar System										✓			
Water Cycle		✓								✓			

Weather

Seasons		✓	✓							✓			
Weather Changes		✓	✓					✓		✓			
Weather Effects		✓	✓					✓		✓			
Water Cycle										✓			
Measuring Weather			✓							✓			
Clouds										✓			

PHYSICAL SCIENCE

Matter

Machines and Work													
Body Chemicals				✓							✓		✓
Structure of Matter													✓
Atoms and Molecules													✓

Energy

Light and Shadows	✓	✓								✓			
Reflections			✓										
Machines											✓	✓	
Solar System											✓		
Light and Earth		✓								✓			

HEALTH

													✓
--	--	--	--	--	--	--	--	--	--	--	--	--	---

PROCESS SKILLS

Experimenting	✓	✓	✓					✓		✓			✓
Hypothesizing	✓	✓	✓					✓		✓			✓
Observing	✓	✓	✓					✓		✓			✓
Classifying	✓	✓	✓					✓		✓			✓
Measuring	✓	✓	✓					✓		✓			✓
Modeling	✓	✓	✓					✓		✓			✓
Concluding	✓	✓	✓					✓		✓			✓
Analyze													✓

Using the Explorer's Logs

Four Explorer's Logs accompany each disk in your *Science Explorers* package. The logs complement the software by providing activities that extend the concepts taught in the program and by reinforcing the process skills embedded in the computer-based lessons. The set of logs for each subject provides the following support:

- Explorer's Log 1 helps students **formulate hypotheses** and **make predictions** and then **test** them through **hands-on experimentation**.
- Explorer's Log 2 helps students hone their **measurement skills** and provides practice with **recording data**.
- Explorer's Log 3 encourages students to use **analytical-thinking skills** to better understand phenomena in their world.
- Explorer's Log 4 extends student **knowledge across the curriculum** to content areas such as language arts, social studies, and art.

The lesson plans that accompany the Explorer's Logs offer teachers guidance on how to implement log activities. They also provide alternative teaching strategies and tips, with special emphasis on how **collaborative learning strategies** can be introduced and how the logs can be used successfully with both more and less advanced students. You may want to use the Explorer's Logs as either introductory or follow-up activities to students' work at the computer.

Using the At-Home Science Handouts

Among the recent goals in science education has been the "demystification" of science. Helping students recognize the relevance of science concepts and process skills to the world outside their classrooms is important.

One way to help your students make the connection between their classroom learning and their "real" lives is to send science home. The At-Home Science Handouts in this manual are highly interesting, motivational activities that challenge students to apply the process skills they learn in class to home-based explorations. These activities are also designed to encourage parents' involvement in their children's science education.

Each unit in this *Science Explorers* series includes two At-Home Science Handouts. The handouts include clear directions so that students can pursue the explorations on their own or with their parents. Assign these handouts as challenges, with the emphasis on the students' fun in exploring rather than on your grading the results.

Using the Glossaries

A reproducible glossary also accompanies each disk in this series. The glossaries provide definitions of all relevant vocabulary used in the program. Students can refer to the glossaries as they use the program. You can also use the glossaries to familiarize students with the vocabulary prior to using the software, to review

ANIMAL ADAPTATIONS



Animals are an important part of your students' world. Whether children care for a family pet, watch neighborhood squirrels scamper up trees, visit zoos, or see animals on TV, they observe animals and are curious about them. Learning about animals and how they fit into an environment is also a first step in understanding the relationships in an ecosystem, knowledge students will need as they grow into adulthood and begin making decisions with ecological consequences.

Although children have ample exposure to animals and their adaptations, they cannot alter the animals or the conditions in which they live to ask, "What happens if...." Nor can they spend the months or years of observation necessary to build a true understanding of adaptations. The computer can both simulate change and compress time, allowing children to explore the adaptive value of various traits.

Science Explorers: Animal Adaptations introduces children to adaptations that enable animals to survive. It illustrates the impact of environmental change on animal populations, and, most importantly, lets children investigate how variations of even a single trait may impact survival.

Objectives

Students will:

- Understand that adaptations aid survival.
- Recognize that body parts, behaviors, and other traits can all be adaptations.
- Identify food, air, shelter, and protection from enemies as survival needs.
- Recognize that variations of a trait can exist within a population and that these variations may influence which members of the population survive.
- Conduct a controlled experiment to investigate the adaptive value of eyespots.
- Analyze the results of the experiment and draw conclusions.

To benefit most from the *Science Explorers: Animal Adaptations* software, your students should be familiar with:

- Animal groups, i.e., species.
- The relationship between animal body parts and their functions.
- Habitats.
- Control of variables in scientific experimentation.

Content

The components of the disk are:

Exploration

Exploring Adaptation This Exploration simulates an actual laboratory experiment in which scientists explored the adaptive value of eyespots (markings on the wings of many moths). As students compare eyespots to other patterns, they formulate and test hypotheses, and draw conclusions based on their results.

Tutorials

How Animals Survive Students learn about the adaptations that enable a variety of animals to get food, protect themselves from enemies, and survive in hostile climates. As students go through the tutorial, they build observation and reasoning skills.

Who Survives? Children explore how changes in the environment can make one variation of a trait more adaptive than another and influence which members of a population survive. They discover how, over time, populations change as the result of environmental changes.

Ideas for Your Classroom

1. Exploring Adaptation, the Exploration on this disk, simulates an actual laboratory experiment. Your students might be interested in learning about the original experiment. Here is a brief description you might share with your students:

This lab is based on a real experiment. In this experiment, scientists placed a pattern at both sides of a dead worm. They put a light under the worm. Then they released a bird. As the bird went to eat the worm, the scientists turned on the light so the bird could see the pattern. The scientists wrote down whether the pattern scared the bird. They did this many times with many different patterns. In this way, they found out which pattern scared birds most often and thus was the most successful adaptation.

For more detail about this experiment, see the chapter "Defence by Colour," in *The Curious Naturalists*, by Nikolaas Tinbergen.

2. This Exploration allows students to compare eyespots with one of five other patterns. Divide your class into teams and assign one of the patterns to each team. Instruct team members to record the final scores for their patterns. When all five teams have completed their experiments, have the class rank the patterns from most to least effective, then make a graph showing these results.
3. In the actual eyespot experiment, scientists used different types of birds and tracked results for each type. Discuss this with students. Do they think the results may have varied by type of bird? Why? What might this imply about the *birds'* adaptations?
4. Here's an interesting bit of trivia to share with your students: Japan Airlines put eyespots on the wings of its planes to scare away birds. Students might enjoy thinking of other problems people might solve by applying animal adaptations.

5. The Tutorials on this disk introduce a lot of new vocabulary: adaptation, camouflage, predator, trait, variation, and population are some key words used throughout the tutorials. Consider handing out the glossary before students use the Tutorials. If you use the Tutorials for group presentations, stop at the screens that define these terms and make sure that your students understand the definitions.
6. One important vocabulary word not introduced in the software is *species*. If appropriate, introduce it to your students. Stop at the screen in Who Survives? that reads “Although they look different, both moths have the same name. They are called peppered moths....” and tell students that peppered moths are a species of moth. Explain that a species is a group of animals or plants that share the same traits and can interbreed.
7. The second Tutorial, Who Survives?, shows how the distribution of a trait in a population can change as the environment changes. Students should understand that such changes usually take place over many generations. For this reason, animals with short life spans, such as moths, are excellent subjects for studying animal adaptations.
8. The first Tutorial, How Animals Survive, concludes with two examples—one of an animal (the coyote) that is adapted to survive in many different ways, and the other of an animal (the koala bear) that is adapted to live a more narrow life. Students should understand that animals such as the koala bear can survive successfully despite their limited diets or range. However, they should also be challenged to consider what might happen if that environment changed: if, for example, the Eucalyptus trees koala bears feed on began to die. Students are probably aware that some animal species face possible extinction. This is a good opportunity to discuss the factors that can threaten a species and the actions people can take to help.

Explorer's Logs

Explorer's Log I: Lesson Plan

Project: Staying Warm

Objectives: Students will formulate and test a hypothesis through a hands-on experiment.

Introduction: In this simple experiment, students explore the adaptive value of various insulators as they predict and then test which one will retain heat longest.

Lesson Plan:

1. The How Animals Survive Tutorial points out that body coverings are adaptations that help animals survive in their environments. Ask students to think of mammals that live in cold climates and to describe their body coverings. How might their body coverings protect these animals?
2. Ask students whether they think all body coverings offer equal protection from the cold. Students should understand that some body coverings help animals retain heat more effectively than others. They should also understand that body coverings can help animals stay cool.
3. Distribute the Explorer's Logs. Explain that this experiment will let students explore how well different materials prevent heat loss, or *insulate*.
4. Review the instructions with your class. If students do not know what a *control* is, explain it to them. Also make sure students understand that they must put the same amount of water in each container and that the water must always start at the same temperature.
5. Divide the class into teams. Each team member will test a different insulator.
6. When students have completed their experiments, discuss the results. Consider following up with a discussion of birds and reptiles. How do they stay warm in cold climates?

Some sample insulating materials:

fake fur

wool scarves

tin foil

a down or poly-filled coat

sheepskin

paper

Explorer's Log I: Hands-on Experiment

Experiment: Staying Warm

Find out how well different materials keep water from losing heat. Then think about how different body coverings help animals stay warm in cold weather or cool in hot weather.

What You Will Need

- Four empty, clean 6 1/2 or 8 ounce yogurt containers and lids. All the containers should be the same size and shape.
- Three different materials for wrapping the containers. Fake fur, dish towels, wool scarves, and tin foil are some examples.
- A hole punch
- A thermometer
- A measuring cup
- Hot tap water

How to Set up the Experiment

Work with your team:

1. Punch a hole in the lid of each container. The thermometer should fit inside the hole.
2. Put one container aside. This is your *control*.
3. Wrap the other three containers, each with a different material. If possible, cover the lids as well as the sides of the containers. (Cover all of the lids or none of the lids. The important thing is to treat all of the containers in the same way.)
4. Run the tap water in a slow stream until it is very hot.
5. Carefully, measure exactly 1/2 cup of water. Pour the water into the control container.
6. Put the top on the container, then put the thermometer through the hole.
7. Record the temperature of the water every five minutes for half an hour.
8. Repeat Steps 3 - 7 with each of the wrapped containers. Each team member should record the temperature for one of the wrapped containers.

Explorer's Log I: Hands-on Experiment

Name: _____ Date: _____

My Hypothesis

I think this material will be the best insulator

My Experiment

Insulator	Temperature of Water at:					
	5 min.	10 min.	15 min.	20 min.	25 min.	30 min.
Control (uninsulated)						
1.						
2.						
3.						

My Results

Read your hypothesis. Did your observations support it? _____

Do you think that good insulators might help cold water stay cold longer?

How might you test this idea? _____

Explorer's Log II: Lesson Plan

Project: Animal Watch

Objectives: Students will observe, categorize, and record an animal's behavior.

Introduction: The amount of time an animal spends engaged in different activities can be a key to what is most important to that animal's survival and why. With this activity, your students can hone their observation, classification, recording, and analytical-thinking skills as they keep records of the amount of time an animal spends at different activities, then speculate on why this may be so.

Lesson Plan:

1. Many of your students probably have pets. Ask students if they think their pets' behaviors would be different if they lived in the wild. For example, would the pets need to spend more time protecting themselves from predators or foraging for food? Lead students to recognize that an animal's behavior is a clue to what is important to its survival.
2. Tell students that scientists learn about animals and their survival needs through observation. They spend many hours watching animals and taking notes on what they see. In this way, they learn how a particular animal is adapted to its environment.
3. Explain that the class will be doing what scientists do: observing animals, recording their observations, then analyzing the results.
4. Elicit suggestions of animals students might observe. These might include a class pet, an individual student's pet, or commonly seen local animals, such as squirrels or chipmunks. If appropriate, assign teams of students to study different animals.
5. Set up an Animal Watch schedule that is appropriate for your class. The more time students spend observing, the better their understanding of the animals will be. Several hours of observations spread over a week or two would be ideal.
6. Distribute the Explorer's Logs and review the instructions. Students should recognize that they can add additional behaviors they see to the list already provided.
7. Once students have completed their field research, they can prepare reports on their animals.

Some sample follow-up activities:

Have students create dioramas showing how their animals spend most of their time.

Read about a naturalist, such as Dian Fossey, whose career was spent observing animals.

Invite a naturalist from a local zoo or science center to talk to students about what scientists have learned by observing animal behavior.

Explorer's Log II: Animal Watch

Name: _____ Date: _____

Observe an animal. Record how much time the animal spends in each activity. Make several observations. Then, add up the total time for each activity. Think about how the animal spends most of its time. What might this tell you about the animal's survival needs?

Animal: _____

Observations

Behavior	Amount of Time Spent	Total
Looking for Food		
Eating		
Sleeping		
Playing		
Climbing		
Running		
Chasing Animals		
Protecting Itself		

What activities seem most important to this animal? _____

Why do you think this is so? _____

Explorer's Log III: Lesson Plan

Project: Who Am I?

Objectives: Students will guess the identity of an unfamiliar animal by analyzing such features as teeth, body covering, and habitat.

Introduction: Challenge your students to describe an animal and its adaptations based on what they can observe in a picture.

Lesson Plan:

1. Tell students that you have a challenge for them. You are going to show them pictures of four animals they are unlikely to recognize. Their challenge is to see how much they can tell about the animals and their adaptations just by looking at the pictures.
2. Hand out the Explorer's Logs.
3. When students have completed their work, talk about each animal in turn. For example, ask how many students thought the first animal was a meat eater. On what basis did they reach this decision? How many thought that the fourth animal lived in a cold climate? Why?
4. When you are ready, identify the animals for your students.
5. Here are brief descriptions of the four animals:

A. Tasmanian devil: The Tasmanian devil is a slow but strong animal found exclusively on the island of Tasmania, off the coast of Australia. It is a nocturnal animal that eats small mammals, fish, reptiles, and invertebrates and lives in Eucalyptus groves.

B. Cape pangolin: The cape pangolin is an African anteater that lives in dry, sandy areas. It is slow and nocturnal. It uses its highly developed sense of smell to sniff out ant colonies, and its long, sticky tongue to eat the ants.

C. Lechwe (leech' wee): The lechwe is an African antelope that lives in marshy areas near rivers and lakes. It runs swiftly, fleeing predators that disturb it while it feeds on grasses and water plants.

D. Takin ('täk-en): The takin is related to the goat, but resembles an antelope. It lives high in the Himalayas and in western China. It lives on mountain vegetation.

Some sample follow-up activities:

Challenge students to create a series of Who Am I? flash cards. They can cut pictures of unfamiliar animals from magazines, mount them on one side of the cards, and then name and describe the animals on the other.

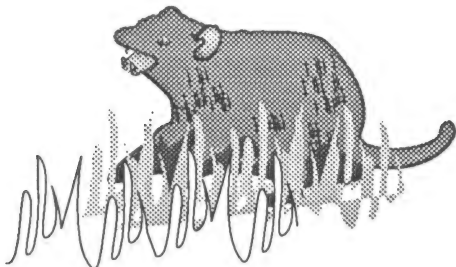
Have students research the animals on the Explorer's Log.

Explorer's Log III: Who Am I?

Name: _____ Date: _____

Answer the questions about each animal.

TASMANIAN DEVIL



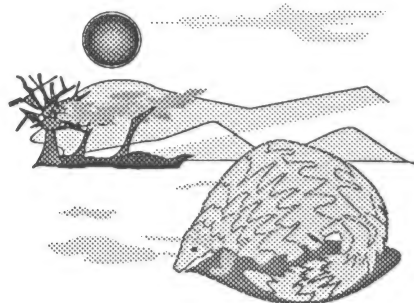
What might I eat? _____

Where might I live? _____

Am I fast or slow? _____

How might I protect myself? _____

CAPE PANGOLIN



What might I eat? _____

Where might I live? _____

Am I fast or slow? _____

How might I protect myself? _____

LECHWE



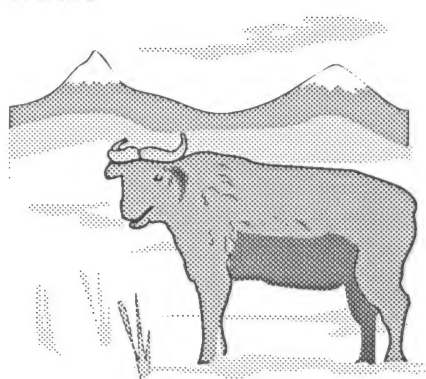
What might I eat? _____

Where might I live? _____

Am I fast or slow? _____

How might I protect myself? _____

TAKIN



What might I eat? _____

Where might I live? _____

Am I fast or slow? _____

How might I protect myself? _____

Explorer's Log IV: Lesson Plan

Project: Endangered Around the World

Objective: Students will increase their knowledge of geography as they identify the countries endangered animals come from and locate those countries on a map.

Introduction: Animals are endangered all over the world. This activity can heighten students' awareness of endangered animals while building their geography and map-reading skills.

Lesson Plan:

1. Ask students if they know what an *endangered species* is. Elicit the suggestion that an endangered species is one in danger of becoming extinct, or dying out.
2. Explain that species are endangered all over the world. Review some of the reasons, both natural and man-made, that species become endangered (drought, destruction of habitat, introduction of a new predator, destruction of food source due to overpopulation or other causes, hunting).
3. Hand out the Explorer's Logs. Explain that all the animals on the list are endangered. Students will find out where each animal comes from, then place a pin on the map to show the animal's country or continent. Consider assigning one or two animals to each student in your class or having teams of students work together to research a group of animals.
4. You can obtain a complete list of endangered and threatened species from the U.S. Department of the Interior, U.S. Fish and Wildlife Service. Ask for the report titled "Endangered and Threatened Wildlife and Plants," published April 15, 1990.

Some sample follow-up activities:

Have each student select an animal on the list and write a research paper about it. The paper should include suggestions of how people can work to help save the animal species.

A local zoo or nature center may have animals from endangered species. Find out. Then visit the zoo or have a zoo staff member visit the school to talk about efforts to save endangered species.

Many science groups now have "adopt an animal" programs. Students can, for example, raise money to adopt a whale. The money goes to help protect the species, and the students receive information about their adopted animal.

Explorer's Log IV: Endangered Around the World

Name: _____ Date: _____

The animals on this list are all endangered. Find out where they live.

Animal	Country/Continent
African elephant	
Arabian gazelle	
Asian elephant	
Bactrian camel	
Bobcat	
Black-footed ferret	
Brown bear	
Brown hyena	
Cheetah	
Chimpanzee	
Chinchilla	
Desert tortoise	
Giant armadillo	
Giant panda	
Gorilla	
Jaguar	
Japanese macaque	
Leopard	
Red kangaroo	
Spanish lynx	
Sperm whale	
Volcano rabbit	
Wallaby	
Western giant eland	
White rhinoceros	

At-Home Science I

Project: Build a Bird Feeder

Learn about the birds that live in your neighborhood by inviting them over for lunch!

What You Will Need

- An empty coffee can with a lid
- Scissors
- A stick that is several inches longer than the can
- Twine
- Birdseed
- A measuring cup
- A place to put your bird feeder

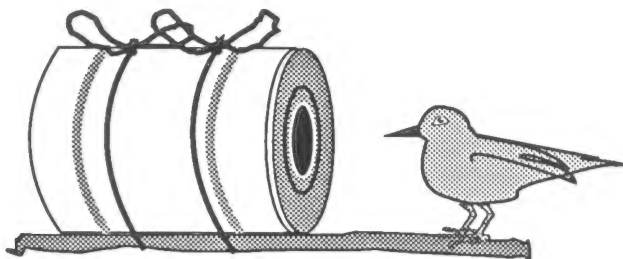
What to Do

1. Cut two pieces of twine. Each one should be long enough to tie around the can or jar.
2. Cut a two-inch hole out of the plastic cover of a coffee can. Put the cover back on the can.
3. Hold the stick against the side of the can or jar. Use the twine to tie on the stick. The stick will be a perch for the birds. Your bird feeder should look like the one in the picture on your activity sheet.
4. Put a cup or more of birdseed in the feeder.
5. Use more twine to hang your bird feeder from a tree, or find a window sill or table on which to place the feeder.

At-Home Science I: Build a Bird Feeder

Name: _____ Date: _____

Make your bird feeder. It should look something like this:



Make notes on the birds that come to your bird feeder.

Bird name or description	When seen	How long it stayed

At-Home Science II

Project: Imagine an Animal

Imagine an animal that would live where the ocean meets the land. It might swim. It might walk. What would it look like? What would it eat? What special adaptations might it have?

What You Will Need

- A pencil or crayons

What to Do

1. Think about animals that can live at the edge of the ocean (clams, sea worms, snails) or those that live in water and on the land (turtles and frogs).
2. Read about the animals at the library if you'd like. Then write down some of these animals' adaptations.
3. Make up an imaginary animal that can live on both land and in the sea. Draw a picture of your animal and write a description. Let your imagination soar, but make sure that your animal can survive in its environment.

At-Home Science II: Imagine an Animal

Name: _____ Date: _____

These are some adaptations of real animals that live in both water and on the land:

This is my imaginary animal:

This is what my imaginary animal is like:

GLOSSARY

adaptation	The body parts, behaviors, and other traits that aid survival are called adaptations.
camouflage	Camouflage is a type of adaptation that makes animals look, sound, or smell like something other than themselves.
hibernation	The sleeplike state that enables some animals to survive the winter without eating is called hibernation.
migrate	Animals migrate when they move from one climate to another for part of the year.
predator	A predator is an animal that eats other animals.
population	A population is a number of animals of the same kind that live in the same place.
species	A species is a group of animals or plants that share the same traits and can interbreed.
trait	A trait is a behavior or body part that makes an animal special.
variation	Differences in a trait are called variations.
warning colors	Bright colors that advertise the danger some animals pose to predators are called warning colors.
well-adapted	When an animal has a trait that increases its chance for survival, it is said to be well-adapted.

DAY, NIGHT, AND THE SEASONS



Day, night, and the seasons are among the most familiar parts of your students' everyday lives. They have daily experiences with the changes caused by the Earth's tilt, revolution, and rotation, yet they cannot directly observe these phenomena. Therefore, their everyday understandings of what causes the transformation of day to night or winter to spring are often at odds with scientific reality.

The computer can model the rotating and revolving Earth, thereby enabling students to see these unseen cycles. What's more, it can let students manipulate a model of the Earth. As students use *Science Explorers: Day, Night, and the Seasons* to explore the effect of changing the tilt of the Earth or to simulate the Earth's orbital path, they gain deeper understanding of fundamental earth science concepts and appreciation of forces that shape their daily lives.

Objectives

Students will:

- Recognize that the Earth orbits the sun.
- Understand that the Earth's orbit and tilt make the seasons.
- Understand the relationship of a day, a month, and a year to the movements of the Earth and moon in space.
- Formulate a hypothesis and conduct a controlled experiment.
- Investigate how a change in the Earth's tilt would affect the seasons.
- Analyze the results of an experiment and draw conclusions.

To benefit most from the *Science Explorers: Day, Night, and the Seasons* software, your students should be familiar with:

- Models and simulations.
- Control of variables in scientific experimentation.

Content

The components of the disk are:

Exploration

Exploring the Earth's Tilt Students are challenged to formulate a hypothesis about whether or not a change in the Earth's tilt would alter the seasons. They then test their hypothesis by selecting one of four alternative tilts for the Earth and seeing what the weather in Chicago, Illinois, would be like in each season if the Earth had that tilt. As students conduct their experiments, they discover not only the impact that the Earth's tilt has on the seasons, but also the importance of taking a systematic approach to scientific investigation.

Tutorials

Our Planet Students learn about the relationship of the Earth and the sun and how the Earth's movement around the sun influences the seasons. As they do, they call upon their prior knowledge of seasonal change to answer questions about the Earth's orbital position at different times of the year.

Night and Day In this Tutorial, students examine the reasons we have day and night and why the day and night skies are different.

Ideas for Your Classroom

1. The first Tutorial on this disk, Our Planet, challenges students to guess how long it would take to walk to the sun. Make sure students understand that the number of years given assumes walking all day and all night—no stops for celestial burgers or a few hours of heavenly rest along the way!

To further underscore the vast distance between the Earth and the sun, challenge students to speculate on what they would need to create an accurate model of the Earth and the sun. How big should the ball representing the sun be? How about the one for the Earth? How far apart would they need to be? Your students are unlikely to suggest one correct solution: Use a basketball for the sun and a marble for the Earth, then place them in opposite end zones of a football field.

2. In explaining the effect of the Earth's tilt on the seasons, the Our Earth Tutorial explains that the part of the Earth tilted toward the sun is hotter and has summer; the part tilted away is colder and has winter. Stop the Tutorial at this screen and ask students why they think this is so. Students may erroneously suggest that the part of the Earth tilted away from the sun is further away, and therefore gets less sunlight. Point out that, given the vast distance between the Earth and the sun (93,000,000 miles), the slight difference in distance caused by the Earth's tilt does not have an effect on the seasons. Explain that what changes is the angle of the sun's light. Consider handing out the first Explorer's Log at this point, so that students can investigate differences in brightness between direct and slanted light.
3. The first screen of the second Tutorial, Night and Day, tells students that the sun *seems* to rise every morning. Ask students why they think the word *seems* is used here. Elicit the suggestion that the Earth, not the sun, is moving. Therefore, the sun does not rise or set, it just looks as if it does.

4. In Exploring the Earth's Tilt, the Exploration on this disk, students manipulate a model of the Earth. Before assigning this Exploration, discuss the use of computer models and simulations in scientific research. Ask students why they think models are valuable. Also ask whether they think that the information simulations provide is foolproof. Discuss the benefits and limitations of this kind of research.
5. To draw conclusions in Exploring the Earth's Tilt, students must compare the results of their experiment with the actual seasons in Chicago, Illinois. Some students might find this comparison easier to make if they conduct the trials of their experiment in order from January through October. This way, the order of the data in their chart will match the order in the chart showing the actual seasons.
6. Students can explore the effect of four different tilts on the seasons in Chicago. After students have run the Exploration for one of the tilts, divide the class into groups. Pose this challenge: Each group is to select a tilt they have not yet explored. Before each trial, they will predict what effect, if any, this new tilt would have on the season. Will January be warmer? Colder? How much of a difference will there be? Group members can create a double-bar graph showing their prediction and the computer-generated results for each month.
7. As a follow-up to Exploring the Earth's Tilt, challenge students to consider how each of the four alternate tilts might affect weather at the Equator.

Explorer's Logs

Explorer's Log I: Lesson Plan

Project: Why Is the Sun Brighter in Summer?

Objectives: Students will formulate and test a hypothesis through a hands-on experiment.

Introduction: Help students understand why the angle of the sun's light affects temperatures on the Earth with this simple experiment, which demonstrates differences in brightness of more and less direct light.

Lesson Plan:

1. Use both the [Exploring the Earth's Tilt](#) Exploration and the [Our Planet](#) Tutorial to introduce students to the effect of the Earth's tilt on the seasons.
2. Make sure students understand that the the sunlight reaching the part of the Earth tilted toward the sun receives is more *direct* than the sunlight reaching the part tilted away from the sun.
3. Explain that students can explore how the angle of the sun's light changes with the seasons through a simple experiment that uses a flashlight to represent the sun and paper to represent the Earth's surface.
4. Pair students, then distribute the Explorer's Logs.
5. Review the instructions. Make sure students realize that the flashlight always gives off the same amount of light.
6. When students have completed their experiments, discuss the results.

Sample follow-up experiment:

Try the same experiment outside on a sunny day, using a paper tube to focus sunlight on the surface of a ball.

Explorer's Log I: Hands-on Experiment

Experiment: Why Is the Sun Brighter in Summer?

The angle of the sun's light changes with the seasons. Explore how the brightness of light changes when the angle changes.

What You Will Need

- A flashlight
- A sheet of black construction paper
- A sheet of graph paper
- A pencil

How to Set up the Experiment

Work with a friend:

1. Place the black paper on the table.
2. Hold the flashlight one foot above the paper. Point the flashlight directly toward the paper.
3. Turn on the flashlight. Note how bright the light looks.
4. Turn off the flashlight.
5. Now hold the flashlight at an angle. Turn the flashlight on again. Note how bright the light is this time.
6. Now have your partner hold the flashlight. Repeat Steps 1 - 3, but use the graph paper. Draw a circle around the lit area. Count the number of squares in the circle. Record the number.
7. Repeat Steps 5 - 6 with the graph paper. Draw a circle around the lit area. Count the number of squares in the circle. Record the number.

Explorer's Log I: Hands-on Experiment

Name: _____ Date: _____

My Hypotheses

I think that the direct light _____ be brighter than the
(will/will not)
slanted light.

I think that the direct light _____ cover more squares
(will/will not)
on the graph paper than the slanted light.

My Experiment

STEP 1: Set up the experiment with the black paper.

STEP 2: Record your observations.

STEP 3: Set up the experiment with the graph paper.

STEP 4: Record your observations.

The direct light covered _____ squares on the graph paper.

The indirect light covered _____ squares on the graph paper.

My Results

Read your hypotheses. Which were supported? _____

Do you think the light would be brighter if you held the paper at a greater slant to the flashlight? _____

Do you think it would cover a greater number of squares? _____

How might you test these ideas? _____

Explorer's Log II: Lesson Plan

Project: Favorite Seasons Survey

Objectives: Students will conduct a survey and graph the results.

Introduction: Is summer everyone's favorite season? Do some people like winter best? Your students can answer these questions as they use their recording, graphing, and thinking skills to conduct, graph, and analyze a Favorite Seasons Survey.

Lesson Plan:

1. Ask students if they have a favorite season. Discuss students' favorite seasons for a while, then tell them that they can more systematically discover which season most people like best.
2. Hand out the Explorer's Logs, plus extra paper for making the graphs.
3. Review the directions with your students. Make sure they understand that they must ask each respondent exactly the same question for the survey to be accurate. They shouldn't "bias" their survey with such questions as, "Most people like summer best. How about you?"
4. If your students will need help making the graphs, consider providing them with a form you have created yourself. Or, once they have completed their surveys, demonstrate how to graph the results. If you have a computer available, graphing software such as Scholastic's *Let's Graph It!* (in *Microzine 35*) or *Graph Maker* (in *Microzine Jr. 2*) might be fun to use.
5. Display the finished graphs on a bulletin board. Did everyone get the same results? If not, why not?

Some sample follow-up activities:

Repeat the surveys, but have one team of students survey students while another surveys adults. Compare the results.

Have students write essays on why they think the winning season is the favorite.

Have students start a "Save this Season!" campaign with project and activity ideas to make the least-liked season more attractive.

Explorer's Log II: Favorite Season Survey

Name: _____ Date: _____

Which season do most people like best? Take a survey to find out. To conduct your survey:

1. Ask someone: What is your favorite season?
2. Make a mark in each box next to the season he or she names.
3. Repeat Steps 1 and 2 with 10 - 20 people.
4. When you are done, make a graph of your results.

Favorite Seasons

Season	Number of People Who Like It Best																
Winter																	
Spring																	
Summer																	
Fall																	

Interpret Your Graph

Which was the favorite season? _____

Which was the least favorite season? _____

Explorer's Log III: Lesson Plan

Project: Where Am I?

Objectives: Students will use their analytical-thinking skills to determine where in the world a letter-writer is located.

Introduction: Can students figure out where in the world someone is based on clues about the season, temperature, and time of day in that place relative to the United States? Find out with this activity.

Lesson Plan:

1. Have students review the [Our Planet](#) and [Night and Day Tutorials](#), then pose this challenge: Can students use clues about the season, temperature, and time of day relative to the United States to figure out where in the world someone is?
2. Review what students know about seasonal and time differences around the world. Make sure they know that the temperature stays consistently warm all year long in the tropics.
3. Hand out the Explorer's Logs. Tell students that they can use maps, globes, and atlases as they try to determine where each letter-writer lives.

4. The letter-writers are from:

Letter 1: Inverness, Scotland

Letter 2: Buenos Aires, Argentina

Letter 3: Mombasa, Kenya

Some sample follow-up ideas:

Have students make up and exchange their own letters.

Try to find a school in another country with which to exchange real information about the seasons. Contact consulates or the United Nations.

Explorer's Log III: Where Am I?

Name: _____ Date: _____

Read each letter and decide where the writer lives. Choose the correct locations from this list:

Bombay, India

Mombasa, Kenya

Inverness, Scotland

Buenos Aires, Argentina

Geneva, Switzerland

Montreal, Canada

Letter 1

Dear Friend,

Today was soooo cold, but it was a bonny day. As usual for January, the sun did not rise until 10:00 this morning. Some of the smaller loches are frozen, so we were able to skate in the afternoon. But we had to be home by 3:00. It was already getting dark!

Where am I? _____

Letter 2

Dear Friend,

Hello! Is it cold up in Maine today? It is very hot here. I went swimming this morning, and I just finished lunch. I guess you just had lunch, too. It's so funny to think that it's lunch time for both of us, but where you are it's winter and where I am it's summer!!

Where am I? _____

Letter 3

Dear Friend,

Happy New Year! It is morning here. I've had my first breakfast of the new year. You must still be asleep as I write this letter. It is as hot as usual here, and dry. We are still four months away from the rainy season.

Where am I? _____

Explorer's Log IV: Lesson Plan

Project: Make a Calendar

Objective: Students will learn about calendars used by other cultures, then invent calendars of their own.

Introduction: Our Gregorian calendar is but one of many used through the ages. This activity helps students appreciate other cultures, as well as the difficulties of measuring time, as they learn about different calendars and then create their own.

Lesson Plan:

1. Ask students if they know of any New Year's celebrations that do *not* take place on January 1. Students might suggest Chinese New Year, which usually falls around the middle of January, and the Jewish New Year, which generally occurs in September.
2. Point out that the Chinese and Jewish New Years are different from ours because the traditional Chinese and Jewish calendars are different from ours.
3. Explain that the modern calendar (called the Gregorian calendar after Pope Gregory XIII, who designed it) is based on the movements of both the sun and the moon—the number of days in a year reflects the approximate period of time of the Earth's orbit around the sun; the number of days in a month mirrors the approximate period of time of the moon's orbit around the Earth.
4. Discuss other bases for calendars with your students. The traditional Jewish calendar is a lunar calendar, as is the traditional Moslem calendar. The Chinese calendar is luni-solar, but it divides the year into 24 half months. The ancient Mayans divided the year into 18 months of 20 days each, plus an extra month of five unlucky days.
5. Hand out the Explorer's Logs and extra paper. Tell students that they will read about other calendars, then create calendars of their own.
6. Elicit the help of your school librarian in finding books about calendars. After students have read about one or another calendar, tell them that they can base their own calendars on one they have studied or make up something fanciful. Will the year start on their birthday? Should winter vacation be its own month? Would they like a five-day week with two week days and three weekend days? With their own calendars, anything is possible.

Some sample follow-up activities:

Create a bulletin board with your students' calendars.

Read about New Year's celebrations in the cultures whose calendars your class has studied.

Explorer's Log IV: Make a Calendar

Name: _____ Date: _____

Answer the questions about your calendar. Then draw the calendar.

How long is your year? _____

How long is your month? _____

How long is your day? _____

What is the first day of your year? _____

Is your calendar similar to any real calendars? If so, how are they alike?

My Calendar:

(use additional paper if you need it)

At-Home Science I

Project: Moon Watch

Is the moon always in the same position in the sky? Find out. Observe the moon each night for a month. Record your observations.

What You Will Need

- A place from which to observe the moon
- A pen or pencil

What to Do

1. Go outside at night. Choose a spot for your observations.
2. Look at the moon. Find something (such as the roof of your house, an antennae, or a tall tree) to use as a marker. Note where the moon is in relation to your marker.
3. Draw your marker on each square of the calendar. Draw the position of the moon in the first square, then label the square with the date.
4. Go outside at the same time the next night. Stand in the same spot. Draw the position of the moon in the second square. Write down the date.
5. Make observations for a month. If you cannot see the moon some nights, leave those squares blank.

At-Home Science I: Moon Watch

Name: _____ Date: _____

Follow the directions. Make your Moon Watch calendar. Answer the questions at the end of the month.

Did the position of the moon change? _____

What do you think you would see if you repeated your observations for another month? _____

At-Home Science II

Project: Make a Telescope

A telescope makes far away things look closer. Scientists use telescopes to study the moon, the stars, and the planets. You can make a simple telescope. It will not be powerful enough to study the stars. But it will show you how telescopes work!

What You Will Need

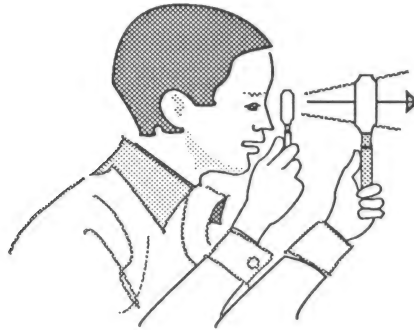
- Two magnifying glasses
- A small object, such as a marble or a ring, to look at through the telescope

What to Do

1. Place the small object on a table.
2. Hold one of the magnifying glasses an inch or so above the object.
3. Record what you see.
4. Now hold one magnifying glass in each hand. Position one magnifying glass above the object, as in Step 2. Hold the second magnifying glass directly above the first, but just a few inches from your face. Look at the picture for help.
5. Move the top magnifying glass closer or further from your face until you can clearly see the object.
6. Record what you see.
7. Use your telescope to look at other objects around your house.

At-Home Science II: Make a Telescope

Name: _____ Date: _____



Describe how the object looked through one magnifying glass.

Describe how the object looked when you used two magnifying glasses to make a telescope.

Try looking at the moon through your telescope. What do you see?

GLOSSARY

- axis** The axis is the imaginary line drawn from the North Pole to the South Pole around which the Earth spins.
- day** A day is the amount of time it takes the Earth to complete one rotation about its axis.
- month** A month is about the length of time it takes the moon to complete one orbit around the Earth.
- orbit** The path the Earth makes as it travels around the sun is called its orbit.
- revolution** Revolution is the movement of one object around another. The Earth completes one revolution around the sun in a year.
- rotation** Rotation is the spinning of an object around its axis. The Earth completes one full rotation every 24 hours.
- tilt** The Earth is tilted, or slanted on its axis.
- year** A year is the length of time it takes the Earth to complete one orbit around the sun.

SIMPLE MACHINES



Simple machines are a wonderful way to open the door of physics for students. This is largely because students can see applications of simple machines all around them: in the playground see-saw, in the ramps that provide handicapped access to their schools, in the doorknobs that open their bedroom doors, or in the clotheslines that hold their drying socks.

However, children might not recognize many of the simple machines in their world, nor might they have many opportunities to create or test such machines. The computer can both introduce children to simple machines and let them experiment with their applications.

Science Explorers: Simple Machines introduces children to four major classes of simple machines and their appropriate applications. Moreover, the program lets children explore the relationship between work, force, and distance. As they do so, they gain an understanding of the physical principles behind simple machines.

Objectives

Students will:

- Recognize that machines make work easier.
- Define a simple machine as a machine with only one or a few parts.
- Identify four classes of simple machines and examples of each.
- Understand that machines do not change the amount of work needed to do a particular job.
- Understand the relationship between force, distance, and work.
- Recognize that different simple machines are suited to different jobs.
- Identify the appropriate simple machine for a given job.

To benefit most from the *Science Explorers: Simple Machines* software, your students should be familiar with:

- The physical concept of work.
- Energy.

Content

The components of the disk are:

Exploration

Exploring Simple Machines Students are challenged to find the best machine for the job as they help a young girl named Wanda move a peanut barrel off a shelf, up some stairs, and over other obstacles to get to a peanut butter machine. Will a pulley do the job? Is the long inclined plane just the ticket? As students make their decisions, they apply their knowledge of simple machines as well as their analytical thinking skills.

Tutorials

It's Simple with Machines Students learn about four major classes of simple machines and their uses. As they do, they build classification and observation skills.

The Mechanical Advantage Simple machines make work easier, but some make work easier than others. Through this Tutorial, students discover the physical relationship between work, force, and distance and why one simple machine can provide greater mechanical advantage than another.

Ideas for Your Classroom

1. The first Tutorial on this disk, It's Simple with Machines, introduces students to four classes of simple machines: inclined planes, levers, pulleys, and wheel and axles. Extend this lesson into your classroom by challenging students to see how many simple machines they can find in their classroom. Consider dividing the class into teams and setting a time limit for this one. Your students should have fun.
2. The second Tutorial, The Mechanical Advantage, introduces the relationship between work, force, and distance through a series of examples and a simulation in which students can experiment with different combinations of force and distance in an effort to lift a load with a lever. Students can do a simple hands-on experiment at their desks which will further reinforce this relationship. All they need is a ruler, a rectangular eraser, and a small object such as a quarter or another eraser. Have students make a lever with the ruler and the eraser. They should place the eraser under the number six on the ruler so that the fulcrum is in the center, then place the load (the quarter or other small object) between the numbers 11 and 12. Students will discover they need very little force to lift the load. Now have students move the eraser under the number 3 on the ruler. They will feel the difference in the amount of force necessary to lift the load!

3. If appropriate for your class, introduce the $W = F \times D$ (work equals force times distance) equation after completing [The Mechanical Advantage](#). One good way to help students understand that different amounts of force and distance can accomplish the same amount of work is to create a table in which W, F, and D are column heads. Fill in the table with all of the combinations of force and distance that can result in a given amount of work.
4. In [Exploring Simple Machines](#), the Exploration on this disk, an on-screen character named Wanda faces four obstacles as she tries to get a barrel of peanuts from the basement of her factory to the peanut butter machine on the top floor. She has eight simple machines available to help her past each obstacle. Consider presenting [Exploring Simple Machines](#) as a whole-class or small-group activity. Before each of Wanda's challenges, encourage students to hypothesize about which simple machine is most likely to help and why. Then try the machine that gets the most votes.
5. If Wanda had a little help from a friend, she might be able to use some of the machines in her factory that she cannot use alone. Challenge your students to figure out which machines would work if Wanda were working with a friend.
6. As a follow-up activity to [Exploring Simple Machines](#), challenge students to make up their own obstacles for Wanda. Students can write descriptions of the obstacles or draw pictures. The class can then consider each obstacle and determine which simple machines might help Wanda move her barrel.

Explorer's Logs

Explorer's Log I: Lesson Plan

Project: Friction

Objectives: Students will formulate and test a hypothesis through a hands-on experiment.

Introduction: Expand your students' understanding of simple machines and work with this simple experiment, in which students explore friction. Students predict which of a series of materials will impede a block's transit down a ramp, and then test their predictions.

Lesson Plan:

1. Explain to students that friction is a force that slows or stops a moving object. Students should understand that friction occurs when one object rubs against another.
2. Tell students that they can discover the effects of friction by covering blocks with different materials then trying to slide the blocks down a ramp. Explain that different materials create different amounts of friction when they rub against each other.
3. Have each student bring to school a material he or she would like to test.
4. Distribute the Explorer's Logs. Review the instructions with your class. Explain that the plain block is a *control*. When students slide the blocks down the ramp, they will compare the speed of the covered blocks with the speed of the control.
5. If appropriate, divide your class into teams. Team members should jointly formulate hypotheses.
6. When students have completed their experiments, discuss the results. Challenge students to think of other simple machine experiments they can conduct.

Some sample materials for covering the blocks:

fake fur

sand paper

felt

tin foil

scotch tape

construction paper

plastic wrap

talcum powder

tape

Explorer's Log I: Hands-on Experiment

Experiment: Friction

Which materials increase friction? Which materials decrease friction? Find out!

What You Will Need

- A three-foot long board wide enough to hold two building blocks side by side
- A step stool or a pile of books about a foot high
- Two or more building blocks or other pieces of wood. The blocks must be the same size.
- Assorted materials for covering the bottom of the blocks
- Scissors
- Strong tape

How to Set up the Experiment

1. Lean the board against the step stool or books to make a ramp.
2. Hold a plain block at the top of the ramp and let go. If the block does not slide down the ramp, make the ramp steeper by adding more books to the pile or putting books on top of the step stool.
3. Choose one of the materials. Cut a piece big enough to cover the bottom of a block.
4. Tape the material to the block. Make sure that the tape is on the sides, not the bottom, of the block.
5. Repeat Steps 3 and 4 with the remaining materials and blocks. If you do not have enough blocks, change the covering on the bottom of some of the blocks after you have tested them. Be sure to leave one block uncovered.
6. Hold the plain block and a covered block at the top of the ramp. Let go of the blocks at the same time. See which one reaches the bottom first. If the plain block reaches the bottom first, the material *increased* friction. If the covered block reaches the bottom first, the material *decreased* friction.
7. Record your results.
8. Repeat the test for each of the different materials, and record the results.

Explorer's Log I: Hands-on Experiment

Name: _____ Date: _____

My Hypotheses

Write the name of each material that you will test. Then check what you think will happen.

Material	Increases Friction	Decreases Friction

My Experiment

STEP 1: Set up the experiment.

STEP 2: Record your results on the chart.

Material	Increased Friction	Decreased Friction

My Results

Did most of the materials increase or decrease friction? _____

Read your hypotheses. How many were supported? _____

Feel the wood block. Now feel some of the materials that increased friction. How is their surface different from the surface of the plain wood block? _____

How about the materials that decreased friction. How is their surface different from the surface of the plain wood block? _____

Explorer's Log II: Lesson Plan

Project: Pulleys

Objectives: Students will build two pulleys and determine the mechanical advantage of each by measuring and recording the amount of rope used to lift a load.

Introduction: With this activity, your students will have first-hand experience of mechanical advantage and the power of pulleys.

Lesson Plan:

1. After students have seen Wanda's simulated pulleys in action (Exploring Simple Machines), tell them that they can make single and double pulleys themselves.
2. Explain that students will be able to test the mechanical advantage of the pulleys they make by measuring the amount of rope they have to pull in order to lift a load.
3. Divide your class into teams. Have each team bring the following materials to school (team members can decide among themselves who will be responsible for which materials): three foot-long lengths of heavy gauge wire (like coathanger wire), five empty thread spools, a ball of twine, and a small pail or other container with a handle.
4. Once you have gathered all the materials, distribute the Explorer's Log. Review the directions with your class.
5. Help each team make its pulleys.
6. Before the teams begin to test the pulleys, make sure they decide on a load to test, assign a team member to measure the amount of rope pulled, and assign a team member to record the results.

Some sample follow-up activities:

Experiment with different loads.

Try a similar experiment with levers or ramps.

Have students look for pulleys in action in their communities.

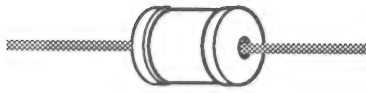
Explorer's Log II: Pulleys

Name: _____ Date: _____

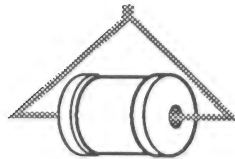
Make two pulleys. Then use them to lift a load. Measure the amount of rope you pull to use each pulley.

How to Make the Pulleys

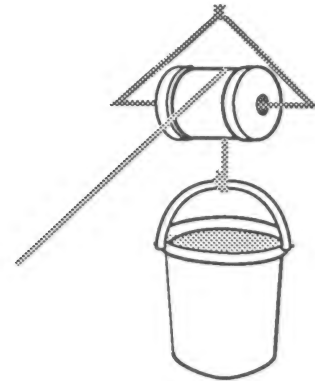
Single Pulley



Slip the wire through the spool.

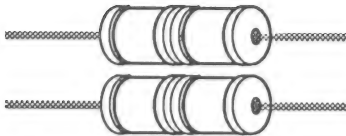


Join the ends of the wire as shown above.

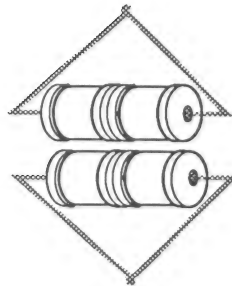


Tie one end of an eight-foot piece of string to the pail. Loop the other end around the pulley.

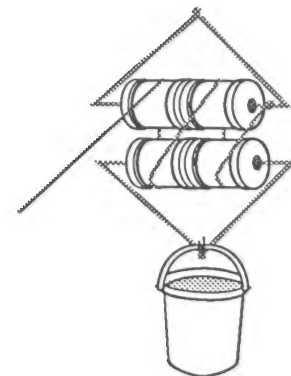
Double Pulley



Make two single pulleys, but use two spools for each instead of one.



Join the ends of the wire as shown above.



Attach an eight-foot piece of string to the pulleys as shown in the picture. Use another small piece of string to attach the pail to the bottom pulley.

Explorer's Log II: Pulleys

Name: _____ Date: _____

How to Do the Experiment

1. Hang the single pulley from a hook. If you do not have a hook, have a friend hold the pulley at shoulder height. The pail should rest on the floor.
2. Put the load in the pail. Lift the load 2 feet off the ground with the pulley.
3. Measure how much string you pulled to lift the load two feet. Record the results.
4. Repeat Steps 1 - 3 with the double pulley.

Results

Amount of string pulled:

Single pulley: _____

Double pulley: _____

Which pulley was easier to use? _____

Why? _____

Explorer's Log III: Lesson Plan

Project: Tool Box Simple Machines

Objectives: Students will use their reasoning skills to determine the type of simple machines embedded in various tools.

Introduction: Do a wheel and axle help you unscrew a screw? Are you using a lever each time you pull a nail? Challenge your students to find out by analyzing the simple machines embedded in some familiar tools.

Lesson Plan:

1. Have students review the [It's Simple with Machines Tutorial](#), then pose this challenge: Can students identify the simple machines in a variety of common tools?
2. Bring out a box of tools you have brought from home or borrowed from the school custodian or shop, then hand out the Explorer's Logs.
3. Have students individually decide which simple machines are embodied in which tools, then discuss each tool with the class. Reach consensus about the simple machines in the tools you use.
4. If tools are unavailable or undesirable, use pictures or substitute classroom objects such as pencil sharpeners, scissors, and hole punchers.

Some sample tools:

shovel: lever

wedge: inclined plane

screw: inclined plane

screw driver: wheel and axle

wrench: lever

Explorer's Log III: Tool Box Simple Machines

Name: _____ Date: _____

Write the name of each tool, and then write the type or types of simple machines you think are part of the tool.

TOOL	SIMPLE MACHINES

Explorer's Log IV: Lesson Plan

Project: Fantasy Machines

Objective: Students will use their imagination, creative writing, and art skills to conjure a simple machine to take care of a task.

Introduction: If your students could have a machine to take over their chores or simplify their most difficult tasks, what would it be? A lever to fling a piece of hated liver from the dinner plate into the dog's bowl? A pulley to lift yesterday's dirty clothes off the floor? Challenge your students to dream up their own fantasy machines, then describe them in words and pictures.

Lesson Plan:

1. Point out to your students that every machine had to be invented by someone at some time.
2. Tell them that they'll now have a chance to be inventors. They should think of a problem they would like to solve, then invent a simple machine to solve it.
3. Remind students that a simple machine is one with only one or a few parts. They can use a type of simple machine they already know about, such as a lever or a pulley, to solve their problem. Try to create an entirely new type of simple machine, or combine simple machines into a complex one.
4. Hand out the Explorer's Logs, pencils, and crayons. Tell your students to have fun!

Sample follow-up activity:

The artists W. Heath Robinson and Rube Goldberg are known for their humorous cartoons depicting mechanical solutions to life's various problems. Elicit the help of your school or town librarian in finding examples of their work to share with your students.

Explorer's Log IV: Fantasy Machines

Name: _____ Date: _____

Think of a chore or task you hate to do. Then think of a machine to do it for you. Describe the machine in the space below. You can also draw a picture of your machine if you like.

The chore:

The machine:

At-Home Science I

Project: How Often Do You Use Simple Machines?

How many times do you use simple machines in a day? Make an estimate. Then keep track of your actual use of simple machines for a day. See how accurate your estimate was.

What You Will Need

- A pen or pencil

What to Do

1. Estimate the number of times you use simple machines each day. Write down your estimate.
2. Make a survey of simple machines in your house. Write the name of each machine on the chart.
3. Each time you use one of the simple machines, put a mark next to its name on the chart.
4. At the end of the day, total the number of times you used simple machines.
5. Compare the total to your estimate.

Some common simple machines you may use:

stairs	step ladders
doorknobs	bottle openers
faucets	jar lids
switches	door hinges

At-Home Science I: How Often Do You Use Simple Machines?

Name: _____ Date: _____

My Estimate

I think I use simple machines _____ times a day.

Simple Machine Use

Fill in the names of the simple machines you use. Then put a check mark next to the name of each simple machine every time you use it. At the end of the day, add up all the check marks.

Object	Type of Simple Machine	Times Used	Total

My Results

Did you use simple machines more or less often than you estimated?

What was the difference between your estimate and your total?

Did these results surprise you? _____

Why? _____

At-Home Science II

Project: Dissect a Doorknob

Every time you turn a doorknob, you use a wheel and axle. Does the wheel and axle make the job of opening the door easier? Find out!

What You Will Need

- A door with a doorknob
- A screwdriver
- An adult to help you

What to Do

1. Close the door. Then use the doorknob to unlatch and open the door. Feel how easy it is to turn the knob.
2. Close the door again.
3. Ask an adult to help you unscrew and remove the doorknob. The knob is the wheel of the wheel and axle. The rod you see when you remove the knob is the axle.
4. Now try to open the door by turning the rod.
5. Complete parts 2 and 3 on the activity sheet.

At-Home Science II: Dissect a Doorknob

Name: _____ Date: _____

PART 1: Dissect the doorknob. Follow the directions.

PART 2: Draw a picture of what the door looked like without the knob.

PART 3: Answer the following questions.

Could you open the door without the knob? _____

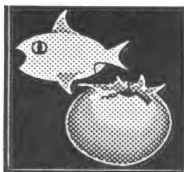
If you could, was it harder or easier than opening the door with the knob?

Name some other wheels and axles that make common jobs easier. Think about things you need to turn in your house or in a car.

GLOSSARY

force	A force is a push or a pull.
friction	Friction is a force that slows down or stops a moving object.
fulcrum	The fulcrum is the point at which a lever moves back and forth.
inclined plane	An inclined plane is a flat surface with one end raised.
lever	A lever is a simple machine made of a bar resting on a turning point called a fulcrum.
machine	A machine is something people use to make work easier.
pulley	A pulley is a kind of simple machine made of a rope looped around a wheel.
ramp	A ramp is one kind of inclined plane.
screw	A screw is an inclined plane wrapped around a rod.
simple machine	A machine with one part or just a few parts is called a simple machine.
wedge	A wedge is two inclined planes put together back-to-back.
wheel and axle	A wheel and axle is a simple machine made from a wheel attached to a rod.
work	Work is what happens when a force moves an object.

NUTRITION



Children are bombarded with messages about nutrition. Television commercials, parental admonitions, and school-based lessons all influence their ideas about which foods are “good” and which are “bad”; which will “build strong muscles” and which will make them fat. Yet students have little opportunity to verify these notions or to analyze the nutritional value of their own diets.

Science Explorers: Nutrition provides students with a powerful tool with which to explore the nutritional content of the foods they eat. As students create menus, they receive immediate visual feedback on the impact one or another food would have on the nutritional balance of a meal, thus gaining insight into an important aspect of nutrition.

Objectives

Students will:

- Understand that all human activity requires energy.
- Recognize that food is a source of energy and that different foods provide different amounts of energy.
- Know that food energy is measured in units called calories.
- Recognize the relationship between activity level and energy need.
- Identify foods rich in protein, fat, carbohydrates, vitamins, and minerals.
- Analyze the protein, fat, and carbohydrate content of meals.

To benefit most from the *Science Explorers: Nutrition* software, your students should be familiar with:

- Food as a source of energy.
- Body parts and functions.
- Nutrients.
- How to read fractions and double-bar graphs.

Content

The components of the disk are:

Exploration

Nutrition Explorer Students explore the balance of fat, carbohydrates, and protein in foods as they use an extensive food data base to create and change menus. A graph showing how the balance of fat, protein, and carbohydrates in the meal they are creating compares to the ideal balance of these nutrients changes with every change in the menu, thus helping students gain insight into the nutritional content of various foods.

Tutorials

Food and Energy The first Tutorial introduces students to food as a source of energy and reviews how the body uses and stores calories.

The Foods You Eat As students learn about the nutritional content of various foods, they are encouraged to draw on their prior knowledge and their classification skills to identify additional foods that contain large amounts of the nutrients in question.

Ideas for Your Classroom

1. *Science Explorers: Nutrition* introduces one approach to analyzing the healthfulness of a diet. Students should understand that this is far from the only approach. Ask students if they are familiar with any alternative theories. Perhaps someone is or knows a vegetarian; perhaps someone's parent or older sibling subscribes to a particular theory of good nutrition.
2. The differences in opinion about what constitutes a healthful diet provide a good springboard for discussing the differences between theory and fact. Your students should understand that the approach to analyzing a diet used in *Science Explorers: Nutrition* is based on current theories that link poor nutrition (specifically, diets containing too much fat and too many calories) to heart disease and some forms of cancer. What do your students know about the dietary risks of fat? Do they know what cholesterol is? Do they think scientists are positive about the links between these nutrients and disease? Lead students to recognize that human health and disease are extremely complex, that we need to make decisions about how we eat based on the best information we have, but that we should always recognize that that information may change.
3. Students should also understand that their overall eating habits, not any single meal, are the measure of a healthy diet. Make sure they recognize that the "ideal" balance is just a guide. Meals can fall short of the ideal but still be healthy.

4. Because the double-bar graph used in the [Nutrition Explorer](#) Exploration must be simple enough for students to interpret, the software does not differentiate between simple and complex carbohydrates or saturated and unsaturated fats. Nevertheless, you may want to introduce these concepts to your students. Consider using the [The Foods You Eat](#) Tutorial to launch a discussion of simple versus complex carbohydrates.
5. The [Nutrition Explorer](#) Exploration incorporates many math skills: graphing, fractions, and, as the number of calories in a meal changes, addition and subtraction. By applying these skills in a meaningful context, students will gain an appreciation for the importance of math. Moreover, they will gain important practice in using these skills. Consider using [Nutrition Explorer](#) as part of your math curriculum as well as a science lesson.
6. The [Food and Energy](#) Tutorial suggests that the amount of activity students get, and therefore the amount of calories they need, varies from day to day. Students can find out how much their own activity levels vary by keeping Activity Journals for a week. They may be surprised by what they discover!

Explorer's Logs

Explorer's Log I: Lesson Plan

Project: Where's the Fat?

Objectives: Students will formulate and test a hypothesis through a hands-on experiment.

Introduction: In this simple experiment, students predict whether a food contains fat, then test their predictions.

Lesson Plan:

1. Use The Foods You Eat Tutorial to introduce students to foods with high fat contents.
2. Ask students to name other foods they think may be high in fat, as well as some they believe are low in fat. List the students' suggestions on the chalkboard.
3. Distribute the Explorer's Logs. Explain that students can discover whether a food contains much fat by making a "fat print" of the food.
4. Review the instructions with your class. Ask students why they think the paper must be left to dry. Make sure they understand that both fat and water in the food leave marks on the paper; they must let their papers dry so that the water evaporates, and they can be sure that the marks are from fat.
5. If your students will do this experiment in class, have each child bring in a piece of food to test. Students can swap foods for the experiment. Some interesting foods to try: avocado, banana, sausage, orange, American cheese, bologna, peanut butter.
6. When students have completed their experiments, discuss the results. Ask students which foods surprised them and why, and what they learned from this experiment. Elicit suggestions for follow-up experiments they could conduct.

Sample follow-up experiment:

Repeat the experiment using foods from one food group: only vegetables or dairy products, for example.

Explorer's Log I: Hands-on Experiment

Experiment: Where's the Fat?

Which foods contain fat? Find out!

What You Will Need

- Several different foods, such as cheeses, sandwich meats, fruits, or nuts.
- A plastic knife
- A pencil
- A light

How to Set up the Experiment

1. Cut a small piece of one food. Rub the piece in one of the squares on your activity sheet.
2. Carefully scrape off any food that sticks to the page.
3. Write the name of the food in the space below the rubbing.
4. Repeat Steps 1 through 3 with the other foods.
5. Leave the activity sheet to dry for several hours.
6. Hold the dried activity sheet up to the light. Which foods left a "fat print"?

Explorer's Log I: Hands-on Experiment

Name: _____ Date: _____

My Experiment

Name of food:

My hypothesis:

This food _____ contain fat.
does/does not

Result:

My hypothesis _____ supported.
was/was not

Name of food:

My hypothesis:

This food _____ contain fat.
does/does not

Result:

My hypothesis _____ supported.
was/was not

Name of food:

My hypothesis:

This food _____ contain fat.
does/does not

Result:

My hypothesis _____ supported.
was/was not

Name of food:

My hypothesis:

This food _____ contain fat.
does/does not

Result:

My hypothesis _____ supported.
was/was not

Conclusions

Do you think more meats or fruits contain fat? _____

How could you test this idea? _____

Explorer's Log II: Lesson Plan

Project: Snack Attack

Objectives: Students will record the amount of cholesterol, salt, sugar, and fat in their favorite snacks.

Introduction: Are students' favorite snacks attacking their health? They can find out by researching and recording the nutritional content of the snacks they love to eat.

Lesson Plan:

1. Ask students to name their favorite snacks. List the snacks on the chalkboard.
2. Ask students whether they think these snacks are healthy. Use the [Foods You Eat](#) Tutorial to stimulate a discussion of what makes a snack healthy or not.
3. Tell students that they can investigate the healthfulness of the snacks they eat by reading the nutritional information that appears on the packaging.
4. Have each student bring in, one of the snacks on the list. If it is a packaged product, make sure the student brings in the empty snack container—milk carton, cereal box, potato chip bag, or yogurt container. A publication such as *Nutritive Value of American Foods* (Agriculture Handbook No. 456, available through the United States Department of Agriculture) can help you track down nutritional information for snacks such as fruits.
5. Review the pertinent information in the listing. Make sure students understand the following:
 - a. The amount of protein, fat, or carbohydrate in a food is measured in units called *grams*.
 - b. One gram of fat contains almost three times as many calories as a gram of protein or carbohydrate.
 - c. Sugar is a type of carbohydrate. Grams of sugar are not listed separately. However, if sugar (or corn syrup, dextrose, honey, brown sugar, etc.) is the first or second ingredient on the ingredient list, or if multiple forms of sugar are listed, the food contains a lot of sugar. Ingredients are listed in order of comparative quantity.
 - d. Sodium means salt. Sodium is measured in milligrams. A milligram is 1/1000 of a gram.
6. Hand out the Explorer's Logs and review the instructions.
7. Discuss your students' results. Did the snacks students thought were healthy turn out to be so? Are any students going to try to change the snacks they eat?

Sample follow-up activities:

Create a bulletin board listing healthy snacks.

Have teams of students make graphs comparing the amount of a given nutrient (e.g., fat) in a variety of snacks.

Explorer's Log: Snack Attack

Name: _____ Date: _____

Record the amount of each nutrient. Be sure to write down grams (g) or milligrams (mg).

My Snack: _____

My Hypothesis

I think my snack _____ healthy.
(is/is not)

Nutrition Information per Serving

Serving size: _____

Calories: _____

Carbohydrates: _____

Fat: _____

Sodium: _____

Sugar:

Number of sugars listed: _____

These sugars are numbers _____ in the list of ingredients.

My Analysis:

I think my hypothesis _____ supported.
(was/was not)

Why? _____

Explorer's Log III: Lesson Plan

Project: What's for Lunch?

Objectives: Students will create lunch menus, then use the [Nutrition Explorer](#) Exploration to analyze their nutritional value.

Introduction: *Science Explorers: Nutrition* introduces one approach to assessing whether a meal is balanced : keeping the amount of fat, protein, and carbohydrates within recommended limits. In this activity, students apply this analysis to lunch menus of their own creation.

Lesson Plan:

1. Tell students that you have a challenge for them. You are going to divide the class into teams and challenge each team to create the healthiest lunch menu they can. Students will use the [Nutrition Explorer](#) software to analyze the nutritional balance of their lunches.
2. Be sure students understand that nutritionists have many ideas about what makes a healthy diet, and that the *Science Explorers: Nutrition* disk introduces just one idea. Review this idea (a healthy diet gets over half its calories from carbohydrates, about a third from fat, and the rest from protein) with your class.
3. Use [The Foods You Eat](#) Tutorial to refresh your students' familiarity with foods that are high in protein, fat, and carbohydrates. Also, demonstrate the [Nutrition Explorer](#) and make sure that students understand how to read the graph.
4. Divide the class into teams and hand out the Explorer's Logs. Review the directions.
5. If you have a printer, make sure that each team prints a copy of its finished graph (see pages 81 and 82 of this manual for printing instructions). Display the graphs on a bulletin board and have the class vote on which lunch they think is the best balanced.

Some sample follow-up activities:

Use the At-Home Science I handout to introduce another approach to creating well-balanced diets.

Have students research alternative points of view on healthy eating.

Have students research typical lunches around the world.

Explorer's Log III: What's for Lunch?

Name: _____ Date: _____

This is my team's menu:

This lunch _____ balanced.
(was/was not)

Why? _____

I think that this lunch would be even healthier if we:

Took out these foods: _____

Added these foods: _____

Explorer's Log IV: Lesson Plan

Project: A Mouthful of Food Phrases

Objective: Students will explore the power of simile and metaphor.

Introduction: What do your students think of when they hear the expression “ripe as a peach” or “skinny as a noodle”? Discuss the images such phrases bring to mind, then challenge students to write some of their own.

Lesson Plan:

1. Write three or four metaphors or similes that use food names on the chalkboard. Ask students what they think of when they hear each expression.
2. Explain that phrases such as these create powerful images because they attribute the qualities of something very familiar (e.g., the color of carrots or the closeness of peas in a pod) to something not so familiar—the object or person being described. Introduce the terms *metaphor* and *simile*.
3. Hand out the Explorer's Log. Explain that students can make up their own food phrases. They should think about the qualities of the food, e.g., its color, shape, texture, or size. They should use the food word to describe something or someone with similar qualities.
4. Instruct students to write stories using their food phrases. Make a book of the finished stories so that students can enjoy each other's work. Consider having your students use a word processor such as *The Bank Street Writer* to write and “publish” their stories. They can add illustrations with a print program such as Scholastic's *SuperPrint*.

Some sample food phrases:

carrot top	butter up
like two peas in a pod	a piece of cake
hot as a tamale	cold as ice
as easy as pie	as sweet as sugar

At-Home Science I

Project: Diet Watch

Do you eat a balanced diet? Find out. Keep track of the foods you eat for a week. See how many servings of food you eat from each food group. See if the numbers of servings matches the numbers some nutritionists think are best.

What You Will Need

- A pencil or pen

What to Do

1. For one week, write down each food you eat in each food group.
2. If you don't know in which group a food belongs, ask an adult for help.
3. At the end of the week, count the number of servings of food from each food group.
4. Compare the number of servings you had with the number some nutritionists think is ideal.
5. Think about ways that you could make your diet come closer to matching that ideal.

Some sample foods from each food group:

Meats, fish, and beans: Beef, chicken, pork, fish, peas, nuts, tofu, and eggs

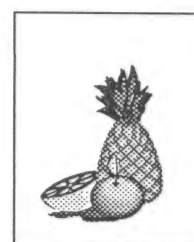
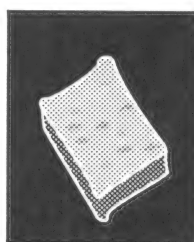
Dairy: Milk, butter, cheese, sour cream, ice cream, and yogurt

Fruits and vegetables: Broccoli, tomatoes, lettuce, bananas, apples, pears, and grapes

Breads and cereals: Bread, oatmeal, rice, pasta, breakfast cereals, and tortillas

At-Home Science I: Diet Watch

Name: _____ Date: _____



MEAT GROUP	DAIRY GROUP	BREAD AND CEREAL GROUP	FRUIT AND VEGETABLE GROUP
TOTAL SERVINGS:	TOTAL SERVINGS:	TOTAL SERVINGS:	TOTAL SERVINGS:

IDEAL SERVINGS PER WEEK = 14

Ideal = 21

Ideal = 28

Ideal = 28

At-Home Science II

Project: Yuck!

Everyone has a least favorite food. Take a survey. See what foods people like least. Make a graph of your results:

What You Will Need

- A pencil or pen
- Crayons
- Friends, family, and neighbors to survey

What to Do

1. Think of ten or more people you can survey. List their names on your worksheet.
2. Ask the first person on your list what food he or she likes the least.
3. Write the name of the food in the first row on the graph. Fill in one box for that food.
4. Ask another person on your list to name his or her least favorite food. If it is a food that already appears on your graph, fill in another box for that food. If it is a new food, start a new row. Write the name of the food, then fill in one box next to the name.
5. Repeat step four for every person on your list.
6. Look at your finished graph. What food got the most votes as least favorite? How many people didn't like it?

At-Home Science II: Yuck!

Name: _____ Date: _____

These are the people I surveyed:

_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

This is my graph:

LEAST FAVORITE FOODS

FOOD	NUMBER OF PEOPLE								

GLOSSARY

- calories** Food energy is measured in units called calories.
- carbohydrates** Carbohydrates are the nutrients that provide most of the body's energy.
- fat** The nutrient fat provides the body with energy. It can be stored and turned back into useful energy when the body needs it.
- minerals** Minerals are nutrients that help keep bones, skin, hair, teeth, and muscles healthy.
- protein** Protein is a nutrient the body uses to build and repair muscles, nails, hair, teeth, and bone.
- starches** Starches are a type of carbohydrate that the body digests slowly. Starches provide energy over a longer time than sugars, which are also carbohydrates.
- sugars** Sugars are a type of carbohydrate that the body digests very quickly. Sugars provide energy quickly, but the energy does not last.
- vitamins** Vitamins are nutrients that keep your blood, skin, eyes, and bones healthy. Vitamins also help your body use other nutrients.

RUNNING THE *SCIENCE EXPLORERS* SOFTWARE

This section of your Teacher's Handbook contains information on installing and using the *Science Explorers* software.

Making a Legal Copy

The disk in this package is an Archival disk. You will use this disk to make a Legal Copy of the program. You should use your Legal Copy for running the program and keep your Archival disk as a backup, in case anything happens to the Legal Copy. To make a Legal Copy:

1. Use any standard copy program or function to copy the entire contents of the Archival disk onto one blank disk. Use the Duplicate Disk function of your ProDOS® System Disk (Apple®), the DOS® DISKCOPY command (MS-DOS), or a commercial disk copying program. If you are using an Apple computer, be sure that your Legal Copy disk is notched on both sides. You will need to copy files onto both sides of the disk.

NOTE: Be sure to copy the complete contents of the disk. Do not change any directory or filenames. If your computer displays a "write-protect" error, either the blank disk that you are using is not notched on the side that you are copying to, or a write-protect tab is covering the notch. To continue, you must either notch the disk or remove the write-protect tab from the existing notch.

2. Find the Legal Copy disk label included in this package. Use a soft-tipped marker to write the serial number from the enclosed Software License and Warranty Agreement in the space provided on the disk label.
3. Put the Legal Copy label on the copy that you created in Step 1. Be sure to put the label on Side 1 of the disk.
4. Store the Archival disk in a safe place with a copy of the Software License and Warranty Agreement.

If your 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 address below for a free replacement. When you receive the replacement, erase the temporary Legal Copy that you made.

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

Scholastic Inc.
P.O. Box 7502
2391 E. McCarty St.
Jefferson City, MO 65102

In Canada:

Software from Scholastic
123 Newkirk Rd.
Richmond Hill, Ontario
Canada L4C 3G5

In Australia:

Ashton Scholastic Software
P.O. Box 579
Gusford, Australia, N.S.W. 2250

For a complete description of your rights and responsibilities in copying disks and using the program, see the Appendix in this manual and the Scholastic Software License and Warranty Agreement included in your *Science Explorers* package.

If You Have an Apple Computer...

Equipment You Will Need

- Apple® IIe, IIc, or IIGS computer with a minimum of 128K of memory
- One disk drive
- A monitor or TV

Loading the Program

To load a *Science Explorers* program into your Apple Computer:

1. Insert the *Science Explorers* disk, Side 1 facing up, into the disk drive, and close the drive door.
2. Turn on the TV or monitor and the computer.
3. The computer will whirl as the program loads. After the title screen appears, follow the instructions on the screen.

Printing with *Science Explorers*

Your *Science Explorers: Nutrition* disk includes a print function that allows you to print copies of meals created with the Nutrition Explorer Exploration. You need to tell Nutrition Explorer about your computer setup. The program will display a menu of options for printing. They are Printer, Interface Card, Location, and Line Feed.

Use the Arrow keys (↑ and ↓) to choose the printer option you want to change, and press Return. Press (←) when you are done.

If You Have an IBM or Tandy Computer...

Equipment You Will Need

- An IBM® PC with color graphics card, Tandy® 1000, or true compatible computer with 256K of memory
- A double-sided disk drive
- A monitor or TV
- A DOS disk (version 2.1 or higher)

Loading the Program

To load a *Science Explorers* program into your IBM or Tandy computer:

1. Make sure your computer is turned off.
2. Turn on the TV or monitor.
3. Insert the DOS disk that came with your computer into Drive A. (Make sure that it is DOS 2.1 or higher.)
4. Turn on the computer. Prompts will appear on the screen telling you to enter the date and the time. Press Enter twice to skip these requests, or enter the date and the time and press Enter after each entry.
5. When the A> prompt appears on your screen, remove the DOS disk from the drive and insert the *Science Explorers* disk, Side 1 facing up, into the disk drive. Close the drive door.
6. Type **RUN** and then press Enter. The disk drive's power light will come on, indicating that the program is loading. After the title screen appears, follow the instructions on the screen.

Printing with *Science Explorers*

Your *Science Explorers: Nutrition* disk includes a print function that allows you to print copies of meals created with the Nutrition Explorer Exploration. You do not have to tell Nutrition Explorer any special information about your computer setup. As long as you have an IBM-graphics compatible printer, you will be able to print copies of Nutrition Explorer meals.

NOTE: If you are using a Tandy dot matrix printer, you will need to set the dip switch for the IBM-graphics mode.

Keys to Know

Clear, on-screen prompts guide your students effortlessly through the program. They need know only the following keys to use the *Science Explorers* software successfully:

→	move to the next screen
Space Bar or → and ←	highlight a choice
Enter/Return	confirm selected choice
?	get help
ESC	go back to the MAIN MENU from a Tutorial; go back to an earlier choice point in an Exploration or to the MAIN MENU from an Exploration
Y/N	answer yes or no to a question

APPENDIX: EDUCATOR'S GUIDE TO SOFTWARE COPYRIGHT POLICIES AND ETHICS

Scholastic believes educators are committed to protecting the intellectual property rights of software authors and publishers. At the same time, we have heard from many of you that copy protection code often inconveniences or impedes the legitimate use of our software.

Beginning August 1, 1989, we have taken the extraordinary step of publishing ALL new Scholastic software without any copy protection code and have even removed such code from our major products published before that date. For your further convenience and cost savings, we are also offering customized lab packs and site licenses for these products. We hope other publishers will soon follow our lead in saying to educators: "You trust us; we trust you."

The following policies and procedures have been developed to protect the copyrights of Scholastic and its authors while at the same time providing educators with the greatest possible convenience when using Scholastic software. These policies are consistent with the 1987 Statement on Software Copyright issued by the International Council for Computers in Education (ICCE). Relevant sections from that document and a model copyright policy from the New York City Board of Education are included for your reference.

Scholastic Software Copyright Policy

- I. All Scholastic non-copy protected software packages consist of one Archival disk or set of disks, a Legal Copy label for each disk, and appropriate documentation. No back up disk(s) are included since the Archival disk(s) will be the back up(s) once Legal Copies are made.
- II. As with all Scholastic software, non-copy-protected programs may be evaluated **FREE** for up to 30 days. During that time, the user **MAY NOT** make copies of any disks or documentation.
- III. If the customer decides to purchase the software, the enclosed Software License and Warranty Agreement **MUST** be filled out and returned to Scholastic.
- IV. The user **MUST** then use the Archival disk(s) to make one and only one Legal Copy of each Archival disk, for use at any one time.
- V. Each Legal Copy disk **MUST** be labeled with the Scholastic Legal Copy label on which the user has entered the serial number provided on the Software License and Warranty Agreement.
- VI. **ONLY** the Legal Copy may be used for educational purposes. The Archival disk **MUST** be stored, to be used again **ONLY** to recopy the program if the Legal Copy becomes defective.
- VII. Under **NO** circumstances may the Legal Copy be used to make additional copies.
- VIII. Schools needing multiple copies of a Scholastic program **MAY** either buy multiple Legal Copies in the form of Customized Lab Packs or purchase a Site License, which entitles them to make unlimited Legal Copies for use within a designated school.
- IX. Under Scholastic's unique LIFETIME WARRANTY, if the Archival disk or the Legal Copy disk itself becomes defective, it may be returned to Scholastic for a free replacement. No questions asked. No shipping or handling charge. However, please note that to be eligible for this Warranty, the customer **MUST** have filled out and returned to Scholastic the Software License and Warranty Agreement.

-
- X. Customers currently owning copy-protected versions of titles that will now be published without copy protection code are entitled to purchase non-copy-protected Legal Copies at low Customized Lab Pack prices. With such a purchase, the customer may also request the Archival disk(s) to be used to recopy the program, in case of Legal Copy disk failure.
 - XI. Scholastic programs are **NOT** to be loaded into more than one computer at a time, unless a Network License has been purchased from Scholastic. This restriction includes hard disk based networks, floppy disk based networks, and any and all multiloading devices.
 - XII. Many Scholastic programs have been designed to be RAM-resident so that they can be removed from computers equipped with only a single disk drive, freeing the disk drive for graphics, data, or spell-checking disks. These programs are **NOT** intended to be multiloaded. We believe multiloading to be an educationally, economically, and legally unsound practice. It wastes valuable instructional time, may limit access to program options that are not wholly RAM-resident, and often leads to premature disk failure. Moreover, it violates the copyrights of our authors and is inconsistent with the rest of our Software Copyright policies which prohibit unauthorized copying, whether the copy is a temporary one (in RAM) or a permanent one (on disk).

We believe the policies listed above will serve the best interests of our customers, our authors, and the field of educational computing.

Excerpts From The 1987 Statement on Software Copyright: An ICCE Policy Statement

The following recommendations and guidelines were approved by the Board of Directors of ICCE in January 1987, after having been developed by the 1986 ICCE Software Copyright Committee.

ICCE Suggested Software Use Guidelines

The 1976 U.S. Copyright Act and its 1980 Amendments remain vague in some areas of software use and its application to education. Where the law itself is vague, software licenses tend to be more specific. It is therefore imperative that educators read the software's copyright page and understand the licensing restrictions printed there. If these uses are not addressed, the following Guidelines are recommended. These Guidelines do not have the force of law, but they do represent the collected opinion on fair software use by nonprofit educational agencies from a variety of experts in the software copyright field.

Back-up Copy: The Copyright Act is clear in permitting the owner of software a back-up copy of the software to be held for use as an archival copy in the event the original disk fails to function. Such back-up copies are not to be used on a second computer at the same time the original is in use.

Multiple-loading: The Copyright Act is most unclear as it applies to loading the contents of one disk into multiple computers for use at the same time. In the absence of a license expressly permitting the user to load the contents of one disk into many computers for use at the same time, it is suggested that you not allow this activity to take place. The fact that you physically can do so is irrelevant. In an effort to make it easier for schools to buy software for each computer station, many software publishers offer lab packs and other quantity buying incentives. Contact individual publishers for details.

Local Area Network Software Use: It is suggested that before placing a software program on a local area network or disk-sharing system for use by multiple users at the same time, you obtain a written license agreement from the copyright holder giving you permission to do so. The fact that you are able to physically load the program on the network is, again, irrelevant. You should obtain a license permitting you to do so before you act.

Model District Policy on Software Copyright

The following model policy was developed by the ICCE Software Copyright Committee which recommended that school districts approve a policy along these or similar lines.

It is the intent of [district] to adhere to the provisions of copyright laws in the area of microcomputer software. It is also the intent of the district to comply with the license agreements and/or policy statements contained in the software packages used in the district. In circumstances where the interpretation of the copyright law is ambiguous, the district shall look to the applicable license agreement to determine appropriate use of the software [or the district will abide by their own approved software use guidelines].

We recognize that computer software piracy is a major problem for the industry and that violations of copyright laws contribute to higher costs and greater efforts to prevent copying and/or lessen incentives for the development of effective educational uses of microcomputers. Therefore, in an effort to discourage violation of copyright laws and to prevent such illegal activities:

1. The ethical and practical implications of software piracy will be taught to educators and school children in all schools in the district (e.g., covered in fifth grade social studies classes).
2. District employees will be informed that they are expected to adhere to section 117 of the 1976 Copyright Act as amended in 1980 governing the use of software (e.g., each building principal will devote one faculty meeting to the subject each year).
3. When permission is obtained from the copyright holder to use software on a disk-sharing system, efforts will be made to secure this software from copying.
4. Under no circumstances shall illegal copies of copyrighted software be made or used on school equipment.
5. [Name or job title] of this school district is designated as the only individual who may sign license agreements for software for schools in the district. Each school using licensed software should have a signed copy of the software agreement.
6. The principal at each school site is responsible for establishing practices which will enforce this district copyright policy at the school level.

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Scholastic recommends that school districts post a summary of the key points of their Copyright Policy wherever computers are in use in district buildings. For example, the New York City Board of Education prints the following information on a large poster that is posted conspicuously in every computer room, and next to computers that are available for staff and student use.

Copyright Law Restated

New York City Board of Education

Division of Computer Information Services

Office of Technical Assistance and Support

131 Livingston Street

Brooklyn, N.Y. 11201

SOFTWARE POLICY

1. Duplication of copyrighted software is prohibited, except for a single Archival copy not to be used simultaneously with the original.
2. School computers may not be used to illegally duplicate copyrighted software.
3. The school must contact software publishers to obtain written permission and procedures for making back-up and multiple copies, other than a single Archival back-up.
4. The school must obtain written permission from the publisher to download or network programs to other microcomputers.
5. The use of illegally duplicated software, however obtained, is prohibited in all Board of Education facilities.
6. The school must obtain the written permission of the publisher to use the original software and its back-up simultaneously.
7. The Principal of each school is responsible for establishing practices which will enforce this policy on the school level.
8. This policy should be posted conspicuously in every computer room, and next to computers that are available for staff and student use.
9. Violators of this software policy will be subject to disciplinary action.

These regulations are applicable to all Board of Education facilities.

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Educators' Guide to Software Copyright Policies and Ethics

Scholastic believes educators are committed to protecting the intellectual property rights of software authors and publishers. At the same time, we have heard from many of you that copy protection code often inconveniences or impedes the legitimate use of our software.

Beginning August 1, 1989, we have taken the extraordinary step of publishing ALL new Scholastic software without any copy protection code and have even removed such code from our major products published before that date. For your further convenience and cost savings, we are also offering customized lab packs and site licenses for these products. We hope other publishers will soon follow our lead in saying to educators: "You trust us; we trust you."

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- II. As with all Scholastic software, non-copy protected programs may be evaluated **FREE** for up to 30 days. During that time, the user **MAY NOT** make copies of any disks or documentation.*
- III. If the customer decides to purchase the software, the enclosed Software License and Warranty Agreement **MUST** be filled out and returned to Scholastic.*
- IV. The user **MUST** then use the Archival disk(s) to make one and only one Legal Copy of each Archival disk, for use at any one time.*
- V. Each Legal Copy disk **MUST** be labeled with the Scholastic Legal Copy label on which the user has entered the serial number provided on the Software License and Warranty Agreement.*
- VI. **ONLY** the Legal Copy may be used for educational purposes. The Archival disk **MUST** be stored, to be used again **ONLY** to recopy the program if the Legal Copy becomes defective.*
- VII. Under **NO** circumstances may the Legal Copy be used to make additional copies.*
- VIII. Schools needing multiple copies of a Scholastic program **MAY** either buy multiple Legal Copies in the form of Customized Lab Packs or purchase a Site License, which entitles them to make unlimited Legal Copies for use within a designated school.*
- IX. Under Scholastic's unique **LIFETIME WARRANTY**, if the Archival disk or the Legal Copy disk itself becomes defective, it may be returned to Scholastic for a free replacement. No questions asked. No shipping or handling charge. However, please note that to be eligible for this Warranty, the customer **MUST** have filled out and returned to Scholastic the Software License and Warranty Agreement.*
- X. Customers currently owning copy protected versions of titles that will now be published without copy protection code are entitled to purchase non-copy protected Legal Copies at low Customized Lab Pack prices. With such a purchase, the customer may also request the Archival disk(s) to be used to recopy the program, in case of Legal Copy disk failure.*
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We recognize that computer software piracy is a major problem for the industry and that violations of copyright laws contribute to higher costs and greater efforts to prevent copying and/or lessen incentives for the development of effective educational uses of microcomputers. Therefore, in an effort to discourage violation of copyright laws and to prevent such illegal activities:

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- 2. District employees will be informed that they are expected to adhere to section 117 of the 1976 Copyright Act as amended in 1980 governing the use of software (e.g., each building principal will devote one faculty meeting to the subject each year).*
- 3. When permission is obtained from the copyright holder to use software on a disk-sharing system, efforts will be made to secure this software from copying.*
- 4. Under no circumstances shall illegal copies of copyrighted software be made or used on school equipment.*
- 5. [Name or job title] of this school district is designated as the only individual who may sign license agreements for software for schools in the district. Each school using licensed software should have a signed copy of the software agreement.*
- 6. The principal at each school site is responsible for establishing practices which will enforce this district copyright policy at the school level.*

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New York City Board of Education
Division of Computer Information Services
Office of Technical Assistance and Support
131 Livingston Street
Brooklyn, N.Y. 11201**

SOFTWARE POLICY

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2. *School computers may not be used to illegally duplicate copyrighted software.*
3. *The school must contact software publishers to obtain written permission and procedures for making back-up and multiple copies, other than a single archival back-up.*
4. *The school must obtain written permission from the publisher to download or network programs to other microcomputers.*
5. *The use of illegally duplicated software, however obtained, is prohibited in all Board of Education facilities.*
6. *The school must obtain the written permission of the publisher to use the original software and its back-up simultaneously.*
7. *The Principal of each school is responsible for establishing practices which will enforce this policy on the school level.*
8. *This policy should be posted conspicuously in every computer room, and next to computers that are available for staff and student use.*
9. *Violators of this software policy will be subject to disciplinary action.*

These regulations are applicable to all Board of Education facilities.

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SOFTWARE LICENSE AND LIMITED WARRANTY AGREEMENT FOR
NON-COPY PROTECTED SOFTWARE PUBLISHED BY SCHOLASTIC INC.

IMPORTANT: READ THIS LICENSE AND LIMITED WARRANTY AGREEMENT CAREFULLY BEFORE USING THE ENCLOSED SOFTWARE AND DOCUMENTATION. THEN, IF YOU AGREE WITH THE TERMS OF THIS AGREEMENT, FILL OUT AND SIGN THE ATTACHED WARRANTY REGISTRATION CARD AND SEND IT TO SCHOLASTIC INC. (SCHOLASTIC). IF YOU DO NOT AGREE WITH THESE TERMS, RETURN THIS PACKAGE TO SCHOLASTIC IN RESALEABLE CONDITION FOR A FULL REFUND.

1. COPYRIGHT

The software programs contained on the disk(s) and the documentation in this package are fully protected by U.S. copyright law. Scholastic and/or the author(s) of this program own all right, title and interest in any copyright in the program. **It is against the law to copy or in any way duplicate the documentation, disk(s), or any portion of the program except under the terms and conditions expressly stated in this Software License and Warranty Agreement.**

2. NON-COPY PROTECTED SOFTWARE

The software programs on the disk(s) in this package are **NOT** copy protected. They are intended for use as Archival disk(s). You **SHOULD** make Legal Copies of the Archival disk(s), but only under the terms described in this Agreement.

Scholastic has provided non-copy protected disks as a matter of convenience for its customers. However, the absence of copy protection in no way diminishes the copyrights of Scholastic and the author(s).

3. USER'S RIGHTS AND RESPONSIBILITIES

Under the terms of this license and U.S. copyright law, you have certain rights to use the disk(s) and documentation included in this package. You also have the responsibility not to use the disk(s) and documentation in a manner that violates this license or copyright laws. Any rights not specifically granted herein are reserved by Scholastic. Your specific rights and responsibilities are:

Previewing the Program

- You **MAY** use and review the software and documentation in this package for up to 30 days before deciding to purchase it. If you do not return the complete package to Scholastic in resaleable condition within that 30 day period, you agree to purchase the software package.
- You **MAY NOT** copy the contents of the disk(s) or any of the documentation in this package for any reasons whatsoever unless and until you have decided to purchase the software.

Completing the Warranty Registration Card

- Once you have purchased the software package, you **MUST** complete the attached Warranty Registration Card and return it to Scholastic to be eligible for technical service, free disk replacement, product information, and free disk updates.

Making and Using Legal Copies

- You **MUST** make one Legal Copy for each Archival disk included in the package. Follow these instructions:
 - Use any standard disk copy program or function to copy the contents of each Archival disk onto one blank disk.
 - On the appropriate Legal Copy label(s) included in your package, enter the serial number that appears on the Warranty Registration Card. Affix this label to the Legal Copy disk(s).
 - Store the Archival disk(s) in a safe place with a copy of this Agreement.
- You **MAY NOT** make more than one Legal Copy of the contents of any disk for use at any one time.
- If you want multiple Legal Copy disks, you **MAY**, as the owner of the program, buy them from Scholastic at a per disk price to create a Customized Lab Pack, or you may buy a site license, which entitles you to make unlimited Legal Copies for use within a defined site.
- You **MAY NOT** make a copy from a Legal Copy disk.
- You **MAY NOT** use the Archival disk(s) for running the program. Use the Legal Copy disk(s) only.
- You **MAY NOT** load the contents of a Legal Copy disk into more than one computer for simultaneous use. This so called "multi-loading" constitutes unauthorized copying and is expressly forbidden by this Agreement.

- You **MAY NOT** copy the program onto a network or other multiple-user device. If you wish to install the program on a network or other multiple-user device, you **MUST** purchase a network version or a network license for the stand-alone version of the program.
- You **MAY** install the program onto and use the program on one hard disk at any one time. To install the program on additional hard disks, you **MUST** purchase additional packages or a site license.

Replacing a Damaged or Defective Legal Copy or Archival Disk

- If a Legal Copy of the program is 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 for a free replacement. When you receive the replacement, you **MUST** erase the temporary Legal Copy that you made.
- If the Archival disk is damaged or defective, return it to Scholastic for a free replacement (see instructions under Software Warranty and Lifetime Replacement Policy below).

Copying the Documentation

- You **MAY NOT** duplicate pages from the enclosed documentation for any purpose unless permission is expressly granted within the documentation.
- You **MAY NOT** make copies of activity books or any other print items that are sold separately by Scholastic.
- For permission to copy print materials for use at workshops or teacher training sessions, contact Scholastic Software at 800-541-5513. In Missouri, call 800-392-2179.

Restriction on Distribution, Sale or Lease of Programs or Documentation

- You **MAY NOT** distribute, sell or lease copies of the program or documentation unless you have been given explicit written permission to do so by Scholastic.

4. SOFTWARE WARRANTY AND LIFETIME REPLACEMENT POLICY

Scholastic warrants the original purchaser of this product that the disk(s) containing the Scholastic program shall be free from defects in materials and workmanship. If a disk becomes defective at any time, you may return it to Scholastic for a free replacement. To be eligible for free disk replacements and technical support, you **MUST HAVE** completed and returned the attached Warranty Registration Card.

Send disk(s) and correspondence to:	Scholastic Software	In Canada:	Scholastic Software
	P.O. Box 7502		123 Newkirk Rd.
	2391 E. McCarty St.		Richmond Hill L4C 3G5
	Jefferson City, MO 65102		Ontario, Canada

5. DISCLAIMER

This warranty does not apply to the software programs contained on Scholastic disks, which programs are sold "as is". This warranty is in lieu of all other warranties, whether oral or written, expressed or implied. Any implied warranties, including implied warranties of merchantability and fitness for a particular purpose, are limited in duration to ninety (90) days from the date of purchase of this product. Scholastic shall not be liable for incidental and/or consequential damages for the breach of any expressed or implied warranty, including damage to property and, to the extent permitted by law, damages for personal injury. Some states do not allow the exclusion or limitations on how long an implied warrant lasts, so the above limitation or exclusion may not apply to you.

This warranty shall not be applicable to the extent that any provision is prohibited by any federal, state, or municipal law that cannot be preempted. This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

6. MISCELLANEOUS

This Software License shall be governed by the laws of the State of New York and shall inure to the benefit of Scholastic Software, a division of Scholastic Inc., its successors and assigns.

7. ACKNOWLEDGEMENT

Licensee acknowledges that he has read this Software License, understands it, and agrees to be bound by its terms and conditions. Licensee also agrees that this agreement is the complete and exclusive statement of agreement between the parties and supersedes all proposals or prior agreements, verbal or written, and any other communications between the parties relating to the subject matter of this agreement.

SERIAL NO.: 230494

DETACH WARRANTY REGISTRATION CARD HERE

SCHOLASTIC SOFTWARE WARRANTY REGISTRATION CARD

To be eligible for technical service, free disk replacement, product information, and free disk updates, please complete the following.

Name: _____

I have read the Software License and Warranty Agreement and agree to abide by its terms.

Signature _____ Date _____

Title: [] Teacher [] Curriculum Coordinator
[] Department Head [] Other (Specify): _____
[] Computer Coordinator

(If non-teacher, please fill in home address)

School _____

Street Address _____

City, State, Zip _____

Title of Product Purchased _____

Date Purchased _____

Ages of Software User(s): (circle all that apply)

6 7 8 9 10 11 12 13 14 15 16 17 18 Adult

Computer Version: [] Apple [] MS-DOS

Disk Format: [] 5.25" [] 3.5"

1. How did you learn about this product?

- [] Scholastic Software Catalog [] Magazine Review
[] Scholastic Sales Representative [] Educators' Workshop
[] Scholastic Authorized Education Dealer [] Scholastic Family Catalog
[] Received Information in the Mail [] Recommended by friend/colleague
[] Magazine Advertisement

2. What factor most influenced your decision to purchase this product? (Please check one box only.)

- [] Scholastic's reputation [] Service/Warranty Policy
[] Price [] Other (Specify): _____
[] Wanted that specific product

(Educators only please continue)

3. School Location: [] Urban [] Suburban [] Rural
School Type: [] Public [] Private
Student Enrollment: [] 1-299 [] 300-499 [] 500+

4. Approximate number of the following computers in your school:

___ Apple II Series ___ IBM/MS-DOS ___ Macintosh

5. Memory most available: [] 48K [] 128K [] 512K
[] 64K [] 256K [] 1MB

6. Disk drive configuration most available:

- [] One 5.25" [] Two 3.5" [] One 5.25" and one 3.5"
[] Network [] Hard Disk

- continued -

DETACH WARRANTY REGISTRATION CARD HERE

Attn: Marketing Dept.

SCHOLASTIC SOFTWARE®
Scholastic
730 Broadway
New York, NY 10003

POSTAGE WILL BE PAID BY ADDRESSEE

BUSINESS REPLY MAIL
First Class Permit No. 9411 New York, NY

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES



▲ FOLD ALONG THIS LINE ▲

7. Which subject(s) use this product?

- Math Language Arts Social Studies
- Science Business Ed Computer Studies
- Reading Other (Specify): _____

8. Where is product primarily used?

- Classroom Library/Media Center Resource Room
- Computer Lab Home Office
- Other (Specify): _____

9. How is the product primarily used?

- Basic Instruction Enrichment Remediation Tool

10. For each of the following questions, enter the code that corresponds to the appropriate answer.

- 01- Teacher 05- Curriculum Coordinator
- 02- Principal 06- Purchasing Agent
- 03- Department Head 07- Other (Specify): _____
- 04- Computer Coordinator

- a) Who expressed initial interest in buying this product? **Code** _____
- b) Who made the final decision to purchase this product? **Code** _____
- c) Who placed the order for this product? **Code** _____

11. What source(s) of funds were used to purchase this product?

- School Budget Federal Funds State Funds
- District Budget Other (Specify): _____

SERIAL NO.: 230494

SEAL WITH TAPE HERE