MICKEY'S SPACE ADVENTURE

TEACHER'S GUIDE

61021

TEACHER'S GUIDE FOR:

MICKEY'S SPACE ADVENTURE

GRADES 3 AND UP

A CHALLENGING COMPUTER ADVENTURE DESIGNED TO PRESENT FACTS ABOUT PLANETARY SCIENCE AND TO REINFORCE MAP MAKING AND READING SKILLS.

TABLE OF CONTENTS

SKILLS AND OBJECTIVES

MICKEY'S SPACE ADVENTURE

— To introduce and reinforce important facts and concepts about our solar system:
  the name of each planet
  the order of the planets from the sun
  the characteristics of various planets and moons
  the concept of gravity
  the concepts of rotation and revolution
— To encourage logical thinking and problem-solving skills
— To strengthen both map-making and map-reading skills
— To further reading comprehension and build vocabulary
— To stimulate interest in space and planetary science

TEACHER'S GUIDE

— To provide suggested teaching strategies for MICKEY'S SPACE ADVENTURE
— To provide classroom management techniques for MICKEY'S SPACE ADVENTURE
— To provide a variety of ideas and materials for reinforcing the information and skills presented in MICKEY'S SPACE ADVENTURE

PROGRESS CHART

— To provide a record-keeping tool for the students and teacher
— To evaluate students' performance
— To suggest strategies for improvement
— To direct students to appropriate follow-up materials

WORKSHEETS

— To reinforce the facts and concepts presented in the Adventure
— To provide practice in using compass directions
— To provide practice in reading maps

COMPUTER CHALLENGE ACTIVITIES

— To reinforce and extend some of the concepts presented in MICKEY'S SPACE ADVENTURE
— To illustrate some of the main elements of programming in BASIC
— To provide hands-on programming experience

FOLLOW-UP ACTIVITIES

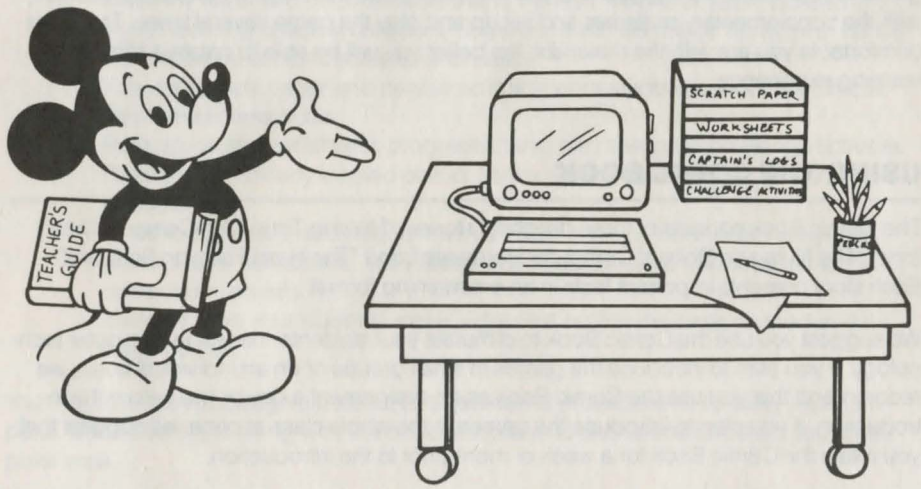
— To present related individual and group activities
— To enhance and extend the concepts presented in the Adventure

COMIC BOOK

— To motivate students to achieve computer literacy
— To understand the history of computer science
— To describe and explain the parts of a computer
— To distinguish between computer hardware and software
— To develop an awareness of the different kinds of computers
— To introduce the concept of programming
— To develop an appreciation for the basic capabilities of computers

POSTER

— To stimulate students' interest in computer technology
— To define computer-related terms
— To illustrate the parts of a computer
— To illustrate different kinds of computer software



INTRODUCTION

We designed MICKEY'S SPACE ADVENTURE with three basic principles in mind. First, students need a firm understanding of our physical universe as well as experience in problem solving. Second, motivation and variety are key elements in insuring students' continuing progress. And third, students should be prepared for an increasingly electronic future. MICKEY'S SPACE ADVENTURE is more than just an entertaining computer game; it's a complete educational package consisting of a wide range of reading comprehension and problem-solving tools. As you read through this teacher's guide, you will notice many suggestions for reinforcing and extending the material presented in the game. We hope that you will find these recommendations useful. At the same time, we encourage you to modify them to the needs of your students and to your own successful teaching style. With this, as with any program, when it comes to your classroom, *you* are the expert.

WHO SHOULD USE THIS GAME?

MICKEY'S SPACE ADVENTURE is recommended for grades 3 and up. It can easily be a part of a science, reading, or social studies curriculum. It can also be used with youth groups or in library media centers.

USING THIS TEACHER'S GUIDE

This teacher's guide is full of suggestions for improving your students' mastery of basic reading comprehension, problem-solving and mapping skills. Before introducing the game to your class, we suggest that you read this guide thoroughly. Familiarize yourself with the supplementary materials and set up and play the game several times. The more comfortable you are with the materials, the better you will be able to create a stimulating learning experience.

USING THE COMIC BOOK

The Comic Book consists of three delightful stories: "Making Time With Computer History," "The Nuts and Bolts of Computer Hardware," and "The Hard Facts on Software." Each story presents important facts in an entertaining format.

We suggest you use the Comic Book to stimulate your students' interest in computer technology. If you plan to introduce the games in small groups or on an individual basis, we recommend that you use the Comic Book as an assignment a day or two before the introduction. If you plan to introduce the games to the whole class at once, we suggest that you rotate the Comic Book for a week or more prior to the introduction.

When your students have read the Comic Book, discuss its contents using the poster as a visual aid. Here are some suggested discussion-starter questions.

1. How did people count in prehistoric times?
2. Where are computers used today?
3. What are some of the jobs computers can be used to do?

4. What is software?
5. What is hardware?
6. What is a monitor?
7. Who can remember some names of computer languages?

Once all of your students have read and discussed the Comic Book, place the copies in your computer area and encourage your students to review them whenever time allows.

USING THE POSTER

The poster illustrates and defines many computer-related terms. Depending on your curriculum needs, it can be used as an introduction to computer technology or as a ready reference chart for reinforcement. It is best placed in a prominent position in your computer area.

PREPARING THE LEARNING ENVIRONMENT

Whether you use these materials in a computer center, a resource room, or a classroom, we suggest you follow these simple guidelines for organizing your learning environment.

- If possible, place your computer on a rolling table. This will make it easy to move to the front of the room or to other rooms for demonstrations.
- Position the computer away from the chalkboard. Chalk dust can damage your equipment.
- To avoid glare, be sure the monitor faces away from the windows.
- Place the keyboard on a low table that is the right height for your students.
- If your learning space is carpeted, beware of static electricity. Spray your carpet with a mixture of fabric softener and water.
- Provide scratch paper and pencils so that your students can work out difficult problems or take notes.
- Reproduce the worksheets, progress charts, and computer challenge activities. Place them in clearly labeled bins or boxes. Check the supply of all materials periodically.
- If possible, provide each student with a folder in which he/she can keep progress charts, worksheets, etc. Place these folders in a file box adjacent to the computer materials.
- Make, or have your students make, signs that outline the basic procedure for machine use.

You may also wish to design a poster that explains the procedure for loading your computer. Use these signs along with the enclosed poster to define and decorate your computer area.

INTRODUCING THE GAME: PART ONE

In order to get your students into the spirit of the adventure and excited about exploring the solar system, we have prepared a special story.

This story sets the scene for MICKEY'S SPACE ADVENTURE. It explains how pieces of a "memory crystal" from the planet Oron have ended up on different planets and moons in our solar system. Only with the help of your students can Mickey and Pluto find the missing crystal pieces and return them to Oron.

Before beginning the game, read this story to your students.

THE MYSTERY OF THE LOST CRYSTAL

On Oron, a planet in the neighboring Alpha Centauri stellar system, an arch-criminal crept into the Hall of Records. He stole only one thing: the precious memory crystal that recorded the entire history of the planet Oron.

He fled to the far edge of the stellar system, where he called back to the planet Oron to state his demands.

"I want to be proclaimed ruler of Oron," he said. "If you don't yield to my wishes, I will break the crystal up in small pieces and hurl it far into the galaxy!"

Oron's officials wanted the memory crystal back, but not at the price of their entire planet. So they refused the criminal's demands.

"Then be forever more a planet without a past!" he cried, breaking the crystal into pieces. He ejected them from his spaceship and fled into the far-beyond, where he was later captured.

Oronian scientists searched the heavens until their tracking devices picked up nine small objects moving steadily away from their stellar system -- the crystal pieces! By plotting their course, the Oronians estimated that the crystals would come to rest in the neighboring stellar system. They would look for them there.

The next stellar system in the galaxy was 75 years away, by even the most advanced space travel. The Oronian life span was too short for someone to make the trip there and back again, so engineers designed a computer-controlled ship for the journey.

Since the memory crystal was not merely a rock but a miniature library of amazing complexity, the pieces had to be found and put back together in a specific order. Scientists installed a special device in the ship, which tracked the crystal pieces in the right order, one crystal at a time.

Hope was high as all of Oron turned out to watch the launch of the new spaceship, but some were skeptical. They knew that the spaceship couldn't bring back the memory crystal unaided. Once the spaceship landed on Earth -- the planet where the first crystal was to be found--an inhabitant of the planet would have to find the crystal and bring it back to the spaceship. Someone would then have to pilot the spaceship to the next planet, then the next, until all the crystal pieces were found, in the correct order, and the crystal was whole again.

"What are the chances of finding intelligent life on the first planet?" they worried. "And even if the first crystal is found, who will be courageous enough to journey to the other planets? Will they be able to understand the computer's tracking system, and use the information to find the crystal pieces in the right order?"

NOTE: Although most of the facts about the planets are true, as of 1984, there are two exceptions. The planets in the Alpha Centauri system, the stellar system closest to our own, have not been named—or even discovered—by astronomers. Therefore, the planet Oron is fictitious. And of course, there is no known life on other planets in our own solar system. The extra-terrestrials Mickey and Pluto meet spring from the imaginations of the Disney and SIERRA design teams. These creatures do, however, reflect environmental characteristics of the planets or moons on which they "live." Also, while Mickey and Pluto travel quickly from one planet or moon to another in the game, in reality, such journeys would take considerably longer—sometimes many years.

INTRODUCING THE GAME: PART TWO

After you present the story, you are ready to introduce the game itself. Here is a suggested lesson plan.

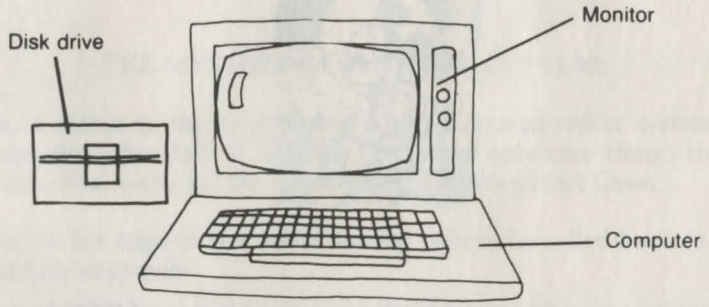
1. Describe the object of the game and provide an overview of play. (This information is provided in the "Playing the Game" section of this guide.)
2. Demonstrate how to load the game.
3. Explain how the game is played. Let students begin under your supervision.
4. Demonstrate how to save a game.
5. Show students how the disk is removed and where it is stored.
6. Finally, remind students to be careful with both the equipment and the disks and to ask for your help if anything is not functioning properly.

If possible, introduce the adventure to small groups of students. This will give you the opportunity to be sure that each student understands how to load and use the game.

LOADING THE GAME AND USING THE COMMAND KEYS

MICKEY'S SPACE ADVENTURE is available on Apple and Commodore computers. Here are the loading instructions for each system:

APPLE II COMPUTERS



1. Insert Disk 1, Side A, into the disk drive and close the drive door.
2. Turn on the power to the computer and monitor, then follow the directions on the screen. Soon you'll see Mickey and Pluto headed down a country road.
3. Press any key to see the next message and then again to see your word options.

Apple Command Keys

SPACEBAR —— Press the SPACEBAR to advance through the options.

⬅ ➡ —— An alternate way to advance through the options.

RETURN —— Press the RETURN key to choose the option.

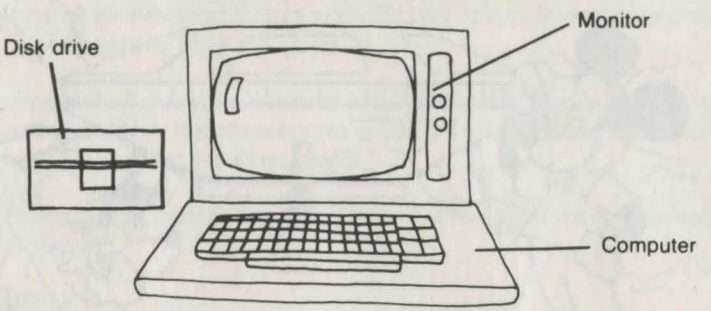
ESC —— Lets you cancel your selection and choose a different option (ESCape).

S —— Turns the sound off (and on again).

C —— Shows you which object(s), if any, you are carrying.

B —— Lets you back up and read a description of the scene you are viewing.

COMMODORE 64 COMPUTERS



1. Turn on the power to the drive.
2. When the whirring stops, turn on the power to the computer and monitor.
3. When the prompt says READY, insert Disk 1, Side A, into the drive. Close the drive door.
4. Type LOAD "MICKEY", 8,1 and press RETURN, then follow the directions on the screen. Soon you'll see Mickey and Pluto headed down a country road.
5. Press any key to see the next message on the screen, and then again to see the word options.

Commodore 64 Command Keys

SPACEBAR —— *Press the SPACEBAR to advance through the options.*

⬅ ➡ —— An alternate way to advance through the options. To move left, hold down the SHIFT key while you press the arrow key.

RETURN —— Press the RETURN key to choose the option.

F1 —— Lets you cancel your selection and choose a different option.

S —— Turns the sound off (and on again).

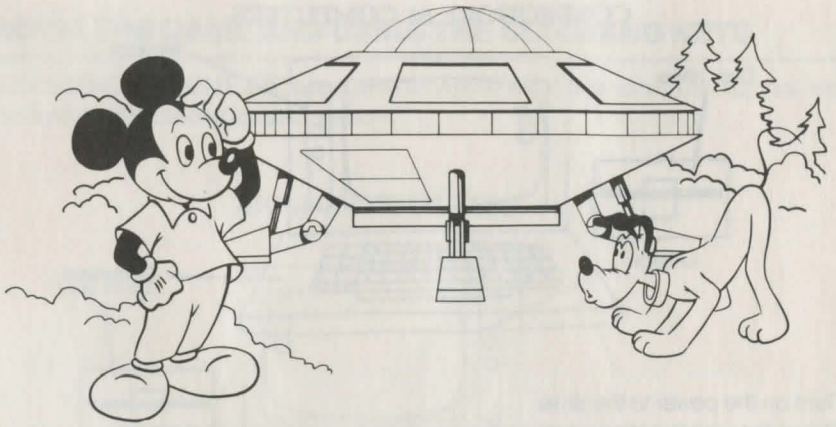
C —— Shows you which object(s), if any, you are carrying.

B —— Lets you back up and read a description of the scene you are viewing.

PLAYING THE GAME

OBJECT AND OVERVIEW OF PLAY

A spaceship from the planet Oron has landed in the hills near Mickey's home. It is on a mission to retrieve nine pieces of a precious memory crystal that have been scattered throughout our solar system by an arch-criminal from the planet Oron. The spaceship is controlled by a computer which tracks the crystal pieces one at a time, in a specific order.



Mickey and Pluto, with the help of your students, will discover the spaceship and the crystal. But before they fly off in search of the remaining pieces, they must gather various objects they will find useful on their journey. Once aboard, Mickey and Pluto will receive clues from the computer. The clues will tell them which planet or moon they are to visit next. When they land on the correct planet, they will search for the crystal, taking great care not to get lost. If they find the crystal, Mickey and Pluto can fly to other planets until all nine pieces have been found.

GETTING STARTED

The game begins in the hills near Mickey's home. Several options will appear on the screen. By pressing the **SPACEBAR**, you will advance through the options on the top line. Press **RETURN** to choose the option you want. Now choose an option from the bottom line and press **RETURN**. If you wish to cancel your selections, press **ESC** (Apple) or **F1** (Commodore). If you are satisfied with your selections, press **RETURN** once again, and the computer will carry out your command.

EXPLORING

By using these two-word commands, you can send Mickey and Pluto exploring in different directions. You should try every possible direction in order not to miss an important clue or an essential tool.

Notice that you are always facing NORTH.

Use the LOOK command to learn more about something of interest. For example, if you are curious about what might be in a cupboard, enter the command LOOK CUPBOARD.

BE PREPARED

You will need to pick up every object you possibly can, including the crystal, before you leave Earth. If you forget something, you will have to return to Earth to get it!

In order to take an object, use the command GET — for example, GET CRYSTAL. You can carry as many objects as you wish.

PLANET CODES

The spaceship can be directed only by a specific code. You must locate that code in the map room of the spaceship before you blast off.

The ship's computer will give you clues as to which planet (or moon) you are to visit next. You must visit the planets in the correct order, or you will not be able to find the crystal. You will be told if you land on the wrong planet.

NOTE: The crystal pieces must be tracked in order, but that order will change each time a new game is begun.

OXYGEN SUPPLY

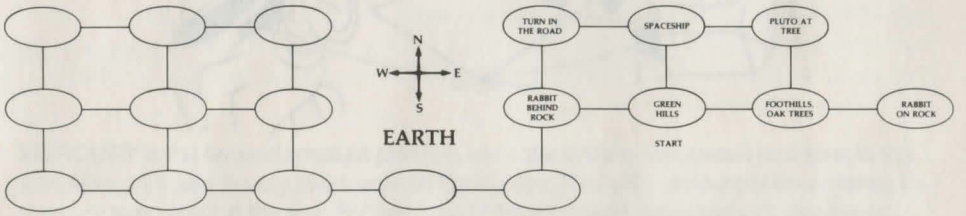
Watch your oxygen supply! When you are in danger of running out, the computer will warn you. To replenish your supply, return to the spaceship and take off the spacesuit.

A WORD ABOUT DISKS

During your travels you will be asked to remove one disk from the disk drive and insert another. You will also be asked to turn each disk over. Be sure to handle the disks only by the labelled edge and place the disk you are not using back in its jacket.

MAKING A MAP

It is very easy to get lost on a planet (or even inside a spaceship!) without a good map. To start you off, we have provided a map of the area around Mickey's house. Some of the places on the map have been labelled. Others need to be filled in. You will need a separate map for each planet (or moon) you visit. You will also need a map for each structure you enter, such as Mickey's house or the spaceship.



Here are some suggestions for making a map:

1. Use one sheet of paper per map. Write down the general area covered by the map (spaceship, Mars, Io, etc.).
2. Label N-S-E-W
3. Draw an oval in the center of the page. That will be the spot where you land or enter. Label it.
4. As you choose a direction on the computer, draw a line in that same direction on your map. Then, draw an oval at the end of it. Again, label the new oval by noting a new landmark. Try to keep all ovals and lines approximately the same size.
5. Keep in mind that you may not be able to go in all directions.
6. Remember: You are always facing NORTH.

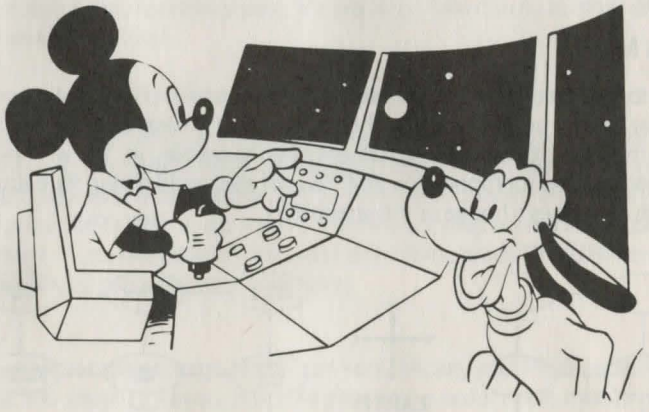
SAVING THE GAME

If you have been playing awhile and you want to stop, you can just turn off the computer. When you return, you will begin a brand-new game. Each time you begin a new game, you will need to visit planets in a different order.

If you would rather return to the game you are now playing, you can save it before you quit. Then when you come back, you can start playing where you left off. You will need a blank disk, one that you will not mind copying over. If you would like, the program will format the disk for you. Just follow the instructions on the screen.

To save a game, go to the center room in the spaceship. Select the SAVE GAME option. Insert your "save game disk" into the drive and enter a number from 1-10 to identify that particular game.

To start playing where you left off, insert disk Side A, then follow instructions to play a saved game. Remember, if you choose to play an old game, it will replace the game that you are now playing.

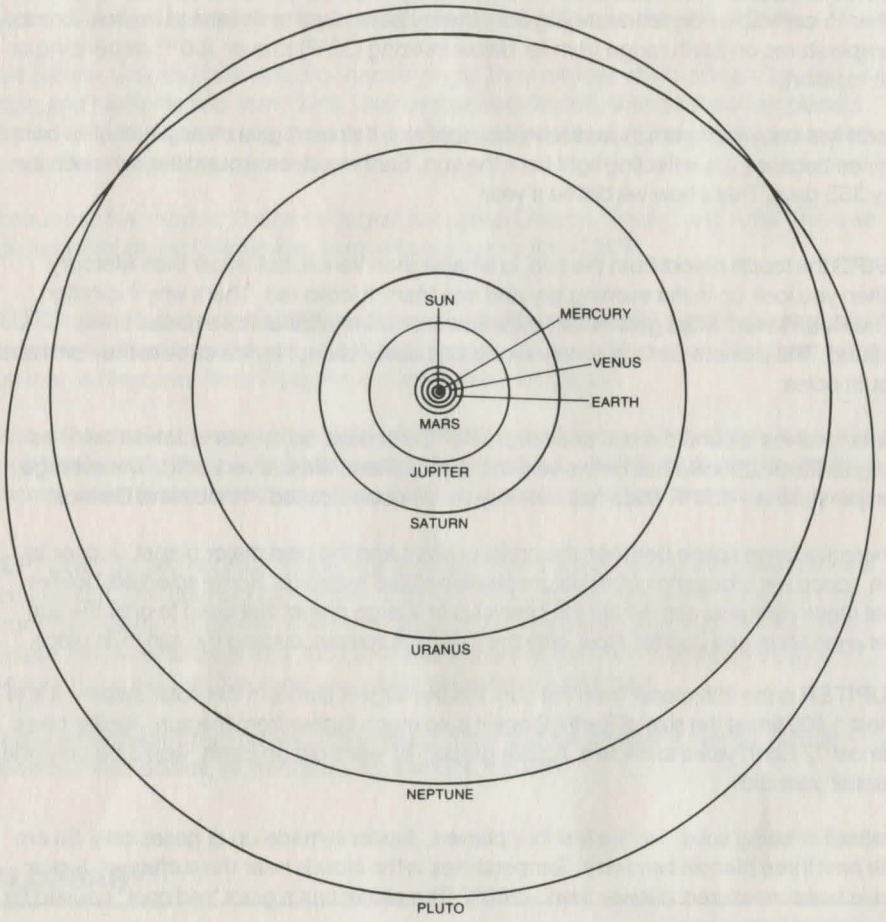


PLANET DESCRIPTIONS

ABOUT OUR SOLAR SYSTEM

We live in a solar system made up of one star (the sun), nine planets, more than fifty moons, and thousands of asteroids. The planets rotate around the sun, and each of the moons rotates around one of the planets. Pluto, the planet which is usually farthest from the sun, is over 3½ BILLION miles away from it. You can see that our solar system is a very large place indeed. Let's look briefly at each of the nine planets.

THE ORBITS OF THE PLANETS



MERCURY is the second smallest planet in our solar system. Because it is closest to the sun, Mercury's year is very short, only 88 Earth days. This is the amount of time it takes for Mercury to go around the sun. But because Mercury rotates very slowly, its day is long. Mercury looks scorched and rugged, much like our Moon. Temperatures can go up to 800°F on the side of Mercury facing the sun. But since Mercury has no atmosphere, the heat is quickly lost on the side facing away from the sun, where it is dark. Temperatures on the dark side can drop as low as −300°F!

VENUS is almost the same size as Earth. It is the second planet from the sun, and takes 225 Earth days to circle it. The planet's surface is dry and rocky. Venus is covered by a dense atmosphere, mostly made of carbon dioxide. Yellowish, sulphurous clouds block much of the sun's light. Surface temperatures reach up to 900°F on the side facing the sun. Night time temperatures are only 20-30°F cooler since the dense atmosphere holds in most of the heat.

EARTH is the third planet from the sun. As far as we know, it is the only planet with large bodies of water. In fact, oceans cover approximately ⅔ of the surface of the planet. The other ⅓ consists of dry land ranging from the icy polar caps to deserts to tropical forests. Temperatures on Earth range from far below freezing (32°F) to over 100°F, depending on the location.

Earth has one moon, which we see in the night sky. It doesn't give off any light of its own; it shines because it is reflecting light from the sun. Earth revolves around the sun once every 365 days. That's how we define a year.

MARS the fourth planet from the sun, is smaller than Venus, but larger than Mercury. When you look up in the evening sky and see Mars, it looks red. That's why it is called "The Red Planet." Mars gets its red color from iron minerals that have rusted in the ground. The planet's surface is very windy and dusty, except for ice caps at the north and south poles.

Mars revolves around the sun once every 687 Earth days, so its year is almost twice as long as Earth's. Since it has only a very thin atmosphere, Mars is very cold. The average temperature is −150°F. Mars has two very small moons, called Phobos and Deimos.

There is a large space between the orbits of Mars and the next major planet, Jupiter. In this space are thousands of miniature planets called asteroids. Some scientists believe that these asteroids came from the break-up of a large planet that used to orbit the sun between Mars and Jupiter. Now, only the asteroids remain, circling the sun in its place.

JUPITER is the fifth planet from the sun. It is the largest planet in this solar system. It is almost 1,400 times the size of Earth! Since it is so much farther from the sun, Jupiter takes almost 12 Earth years to circle it. A sixth grader, 12 years old on Earth, would be only one Jupiter year old!

Instead of being solid, like the first four planets, Jupiter is made up of gases only. So are the next three planets beyond it. Temperatures in the clouds near the surface of Jupiter have been measured at lower than −200°F. The planet has a giant "red spot" caused by enormous hurricanes.

Jupiter has sixteen moons. The two largest, Callisto and Ganymede, are both larger than Mercury. Io and Europa, the next largest, are about the same size as our own Moon. Scientists have observed many active volcanos on Io.

SATURN, the sixth planet from the sun, like Jupiter, is also a gaseous planet. It is the second largest planet in the solar system. Saturn takes almost 30 Earth years to circle around the sun. (If you know someone who is 30 years old, on Saturn that person would have just celebrated his or her first birthday.) Like Jupiter, it is a giant planet, over 800 times as big as Earth. Temperatures on Saturn and its moons average −185°F. Winds just above the cloud tops have been measured at over 900 miles per hour.

Thousands of rings of ice and rock surround Saturn, giving it a very different appearance from those of the other planets. Saturn has 21 moons. The largest, Titan, is the size of the planet Pluto.

URANUS is the seventh planet from the sun. It also is a gaseous planet. Uranus revolves around the sun once every 84 Earth years. It would be a very long time between birthdays on Uranus! Uranus is the third largest planet, over 60 times the size of Earth.

Like Saturn, Uranus is encircled by narrow rings. They are less obvious than Saturn's rings, and harder to see from Earth. Uranus rotates differently than all the other planets. Instead of spinning like a top, the way the other eight planets do, Uranus rolls around on its side like a ball, as it circles the sun.

Uranus has five moons. The three largest are called Oberon, Titania, and Ariel. The average temperature on Uranus and its moons is a very cold −215°F.

PLUTO is now the eighth planet from the sun and will be until 1999. On the average, it is the planet farthest from the sun, but in 1979, its long, skinny orbit carried it in closer to the sun than is Neptune. From Pluto, the sun looks like a bright star.

Pluto is the smallest planet in our solar system and is not like any of the others. It is just a huge block of ice. The average temperature is only about −230°F. Pluto and its moon Charon, which is almost as big as Pluto, take 248 years to complete one orbit of the sun.

NEPTUNE, usually counted as the eighth planet from the sun, is now the planet farthest from the sun, and counted as number nine. It is the fourth largest planet, about 64 times larger than Earth. It is almost a twin to Uranus; it, too, is a gaseous planet without a solid surface. Neptune takes almost 165 Earth years to complete one trip (revolution) around the sun. If you lived on Neptune, you would never have a birthday!

Neptune has two frozen moons. The larger is Triton and the smaller is Neried. Temperatues on these bodies, far from the sun, average −200°F.

GLOSSARY

ALPHA CENTAURI – The stellar system nearest our own.

ANCIENT – Very old.

ASTEROIDS – Very small planets, with diameters ranging from a fraction of a mile to nearly 500 miles. Although about 2000 circle the sun in an orbit between Mars and Jupiter, some have other orbits.

ATMOSPHERE – A layer of gases which surround a planet. When you look up at the sky, you are looking at the bottom layer of Earth's atmosphere.

AXIS – An imaginary line that runs through the center of a planet, from pole to pole. Each planet rotates around this pole as it circles around the sun.

BARREN – Without plant life.

BASIN – A large depression in the land, or in an ocean floor.

BLEAK – Barren, and often windswept.

CARBON DIOXIDE – A heavy, colorless gas that is one of the main ingredients of our atmosphere on Earth.

CHASM – A long, narrow canyon.

CIVILIZATION – The culture of a particular time or place.

CRUST – The outside or surface layer of a planet.

DAY – The length of time it takes for a planet to rotate once on its axis. A day on Earth is 24 hours long.

EASTWARD – Toward the East.

ERUPT – To force out or suddenly release stored-up energy (such as volcanic lava or steam).

EXTENSIVE – Wide or large.

FLAMMABLE – Easily set on fire.

GAS – An almost weightless, sometimes invisible substance (such as gases in our air).

GASEOUS – Describes the planets Jupiter, Saturn, Uranus, and Neptune, which are made mostly of compressed gases. The gaseous planets actually make some of their own heat. You cannot land on a gaseous planet since it has no surface.

GLACIER – A large body of ice moving slowly down a slope or valley or spreading outward on a land surface.

GORGE – A narrow, steep-walled canyon.

GRAVITY – The attraction of a body (sun, planet, moon) to other bodies that holds them near each other. The sun has a gravitational pull on the planets to keep them circling around it, just as a planet has a gravitational pull on its moon(s). Gravity holds you to the ground, and causes you to have weight. This is why you weigh more, or less, on a planet with different gravity than Earth.

HELIUM – A lighter-than-air, colorless, non-flammable gas sometimes used to inflate balloons.

HYDROGEN – A lighter-than-air, colorless, odorless gas that is highly flammable.

ICE (WATER ICE) – A hard, cold substance formed from water when its temperature drops below 32°F (0°C).

IMBEDDED – Enclosed or surrounded, almost a part of something.

INFLATE – To enlarge, usually by blowing in air or gas.

LAVA – Hot liquid rock that flows from a volcano when it erupts—when it cools down, it becomes solid.

METHANE – A colorless, odorless, flammable gas.

METHANE ICE – A hard, cold substance formed from methane when its temperature drops below −297°F (−183°C).

MINERAL – A naturally occurring substance such as stone, coal, salt, petroleum, or sulphur.

MOLTEN – Melted.

ORBIT – The imaginary path followed by a body (moon, planet) when it circles around another body (planet, sun).

OXYGEN – A colorless, odorless gas that forms about 21% of our own atmosphere.

PICTOGRAPHS – Ancient drawings or paintings on a rock wall.

PLANET – A large body that circles around a star.

PRECISE – Exact.

REVOLVE – The circling of a body (planet, moon) around another body (sun, planet).

ROTATE – The spinning motion of a planet or moon as it turns on its axis.

RUGGED – Having a rough or uneven surface.

SOLAR SYSTEM – A group of planets, moons, asteroids, comets, and the stars they revolve around.

SOLID – Having a hard surface. The planets Mercury, Venus, Earth, and Mars have solid or hard surfaces and are generally rocky in composition. Everything in the universe must be either solid, liquid, or gaseous.

STAR – A gaseous body that gives off light and heat.

STELLAR – Relating to a single star or the stars in general.

SULPHUR – An element that exists in both solid and gaseous forms, that is characterized by its yellow color.

SUN – The star around which the nine planets in our solar system revolve.

SURFACE – The top-most layer of a body.

SURROUNDED – Enclosed on all sides.

THERMOMETER – An instrument for finding the temperature of something.

THROTTLE – The lever which controls the fuel to an engine.

MOON – A body of matter that circles around a planet.

NITROGEN – A colorless, odorless gas that makes up 78% of our own atmosphere.

NUTRITIOUS – Nourishing (good for you).

VIBRATION – A regular quivering or trembling motion that often accompanies the operation of an engine.

VOLCANO – A hill or mountain above a crack or hole in a planet's crust, where steam, melted rock, and lava sometimes erupt.

YEAR – The amount of time it takes for a planet to make a full orbit around the sun. A year on Earth is 365 days long.

STRATEGIES FOR IMPROVEMENT

USING THE PROGRESS CHART

A reproducible Progress Chart has been included to help you and your students keep track of their progress. It will also help students to record important pieces of information they will receive on their journey. Each student should be familiar with the log before beginning the Adventure.

1. Objects taken — Here the student lists the various objects that have been picked up. Emphasize that all nine objects *and* the crystal must be found before leaving Earth.

2. Planet Codes — These are found in the map room of the spaceship. It is a good idea to record the codes in this chart. The codes are necessary for directing the ship to the different planets.

3. Planets (or moons) Visited — Each student will record visits to correct planets only. (The student will be told if s/he has landed on the wrong planet.) The student will also record the date of arrival as well as the temperature and Mickey's weight on that planet.

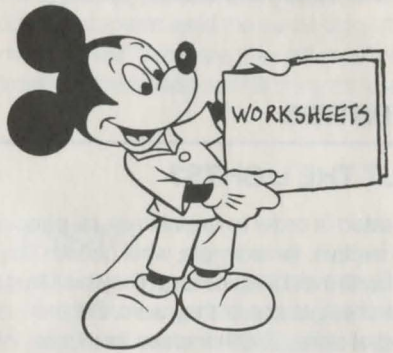
4. Next Assignment — Offers you a chance to give individual assignments of worksheets and/or computer challenge activities.

5. Command Chart — A reference list of Key commands.

USING THE WORKSHEETS

Four reproducible worksheets are provided in this package. Two are designed to test the student's knowledge of basic facts about space. The other two are designed to provide additional practice with map skills.

The worksheets can be used in several different ways. You may wish to assign them to individual students on a prescriptive basis as suggested in the progress chart section of this guide. Another option is to assign them as homework either before or after your students have used the adventures. A third alternative is to assign them to students who are not using the computer on a particular day.



USING THE COMPUTER CHALLENGE PROGRAMS

The computer challenge activities are designed to provide stimulating programming activities for your students. They relate to the skills presented in the game and provide additional practice. There are three challenges included in this package.

Each program is printed on a reproducible worksheet. If you feel that your students are capable of entering the programs themselves, we suggest you reproduce these worksheets and place them in your computer area. If you feel that your students are not ready to enter the programs, we recommend that you type the programs and save them on floppy disks. Label the programs and place them in the computer area for your students' use.

In the first program, the student will choose a planet to visit and enter the travelling speed. The computer will then calculate the amount of time it will take to get there. For an extra activity, have your students convert days of travelling time (given by the computer) into years.

In the second program, the student will enter his or her own weight and select a planet. The computer will then calculate the student's weight on that planet.

The third program is a brief reinforcement of compass directions. An arrow points to different areas around the perimeter of the screen. The student is asked to type in whether the arrow is pointing north, south, east, west, northeast, northwest, southeast, or southwest. (Be sure to instruct your students to type the full word, not just a letter.)

USING FOLLOW-UP ACTIVITIES

The follow-up activities have been designed to further reinforce the skills and information presented in MICKEY'S SPACE ADVENTURE. Each activity has a motivating format and can be easily adapted to individualize instruction, meeting the needs of students with differing ability levels.

You may wish to introduce follow-up activities in the same week that your class begins the Adventure. The activities will improve students' performances on the computer and enlarge their understanding of space. Certain activities are presented to provide links to other curriculum areas such as literature or art.

FOLLOW-UP ACTIVITIES

WHO TURNED OUT THE LIGHTS?

Mythology was often created in order to explain natural phenomena. Have your students invent their own myth to explain, for example, what causes day and night. ("A long, long time ago, the people of Earth lived in darkness. They built huge bonfires to keep warm and carried candles with them wherever they went. But that was before the god of fire became angry with the god of dark...") Other ideas for stories: Why the planets orbit the sun... Why Saturn has rings... Why there is an asteroid belt... Why Venus has no moons... There are lots of possibilities! Students can include Greek and Roman gods in their myths or create their own.

THE UNIVERSE IN MINIATURE

Go outside to the school football field or track field (any large open space will do). Bring with you nine balls, each of which represents a planet. Mercury is a large marble. Venus and Earth are golf balls (remember, they are almost the same size). Mars is a jacks ball; Jupiter is a basketball. Saturn is a soccer ball (you can make your own rings if you like). Uranus and Neptune are softballs (these two planets are also nearly identical in size). Pluto is a small marble. The sun would be a ball 10 feet wide; you'll just have to imagine the sun!

Now have your students "build" a miniature solar system. At one end of the field, decide on the placement for the imaginary sun. Place Mercury about 1 foot away. Venus should be a little over 2 feet from the sun. Earth will be 1 yard away from the sun. Mars should be 1½ yards from the sun, and Jupiter 5 yards from the sun. Place Saturn 10 yards from the sun, Uranus 19 yards from the sun, Neptune 30 yards from the sun, and Pluto 40 yards from the sun. (These distances are based on the average distances between each planet and the sun.)

Note: This imaginary universe is not an exact scaled-down replica of our solar system; it is somewhat compressed in order to fit on one field. In relation to the sizes of the "planets,"

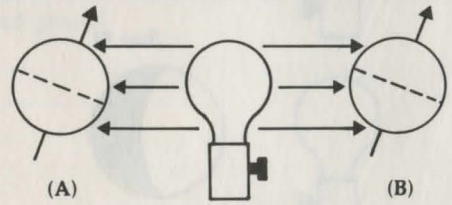
an exact replica would have Mercury, the planet nearest the sun, 134 yards away from it, and Pluto would be nearly 8 miles away!

"OVER THE MEADOW AND THROUGH THE WOODS..."

Children's stories and books often have detailed descriptions of the various locations of major events. The author also may give an idea of the relative distances between these locations. Have students read a book or story, paying close attention to the setting. Then have each student make a map of the general area covered by the tale. Maps could include important buildings, hiding places, streets, rivers, mountains, etc., using as many details as provided by the author. If students read the same story, their maps could then be compared. How are the maps similar? How are they different? Wouldn't it be interesting to find out which map actually came closest to matching the map in the author's mind?

THE REASONS FOR SEASONS

Your students can use an orange, a skewer, and a light bulb to see how Earth's seasons are caused. Stick the skewer through the center of the orange where the stems are. It represents the Earth's axis, an imaginary line which passes from the North Pole through Earth's center to the South Pole. Hold the orange up to the light bulb (which represents the sun).



(A) Tilt the North Pole slightly toward the "sun." This is how Earth looks when the northern hemisphere is experiencing summer and the southern hemisphere is experiencing winter. The north is warmer because the sun is shining more directly on it.

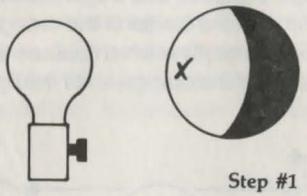
(B) Now walk in a circle halfway around the bulb, keeping the "North Pole" end of the skewer pointed ahead of you at the wall behind the bulb, not at the bulb. The northern hemisphere is now experiencing winter, and the southern hemisphere is experiencing summer. See if your students can figure out where the Earth would be in relation to the sun during spring and fall.

"GET AWAY SPECIALS"

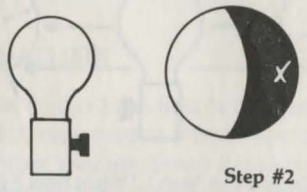
A "Get Away Special" is an experiment designed to be sent into space on the Space Shuttle. This program, created by NASA, offers a chance for anyone to send a scientific experiment into orbit around Earth. One group of high school students is planning to test the effect of zero gravity on an ant colony. Challenge your students to design their own "Get Away Special." What would they like to test in space? Have them draw a picture of their experiment as well as write an explanation of how it will work. Remind them that they need to protect their experiment from extremes in temperature and pressure!

AS THE WORLD TURNS

Your students can make a model of night and day with just a light bulb and a ball. Use a light bulb in an otherwise dark room to represent the sun. Hold the ball, which represents Earth, near the light (Step #1). The side toward the light represents the day side of the planet. Pick a spot on the day side; you can imagine that this is your town represented on a globe. Then slowly rotate (turn) the ball until that spot is on the other side, away from the light (Step #2). It is night there now. Rotate the ball again, in the same direction, until the spot is on the day side, where it began. You have just demonstrated a 24-hour day.



Step #1



Step #2

GALACTIC TRAVEL AGENT

Have students choose a planet and gather as much information about that planet as they can. When their research is complete, they will become travel agents for that planet. They will each make a travel poster to convince the people living on Earth to visit their planet and perhaps even move there permanently. They will obviously have to use a great deal of imagination to convince someone to come to a planet where the average temperature is 700 degrees! Emphasize that each sales pitch can be a creative as the student wants, but must be based on true facts. Some examples... "Come ski the polar ice caps of Mars"... "Tired of long, hot summers? Come to Pluto!"

SOLID-LIQUID-GAS

In this simple experiment, a solid (baking soda) and a liquid (vinegar) are combined to form a gas (carbon dioxide). This can be done as a demonstration, but it is easy enough for students to do in small groups.

1. Fill a bottle ¼ full of vinegar.
2. Fill a balloon ½ full of baking soda.
3. Stretch the balloon over the mouth of the bottle, taking care not to spill any baking soda inside.
4. Lift the balloon straight up, shaking the baking soda into the bottle.
5. When the two substances mix, they form carbon dioxide gas, which fills the balloon.

Explain that Jupiter, Saturn, Uranus, and Neptune are gas planets. It should become clear to your students why a spaceship cannot land on these planets!

CAN YOU FIND THE TREASURE?

Each student will choose his own "treasure" (a pencil, a ruler, a hairclip...) and put it in an inconspicuous place in the classroom. They will then write a list of specific directions to their treasures. The list must include a starting point and use compass directions—GO WEST, instead of TURN LEFT. (You might want to call the front of the classroom NORTH to make it easier.) Emphasize that students can make their routes somewhat roundabout as long as they are clear, accurate, and have no more than ten instructions. A student can then hand his list to another student and challenge him to find the treasure. You may wish to try this activity in small groups.

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