DOCUMENT RESUME

ED 373 173 CE 066 976

TITLE	Laser Disc Technology: A Visual Approach to Reading. Final Report.
INSTITUTION	TIU Adult Education and Job Training Center, Lewistown, PA.
SPONS AGENCY	Pennsylvania State Dept. of Education, Harrisburg. Bureau of Adult Basic and Literacy Education.
PUB DATE	30 Jun 93
CONTRACT	98-3028
NOTE	146p.
PUB TYPE	Reports - Descriptive (141)
EDRS PRICE	MF01/PC06 Plus Postage.
DESCRIPTORS	*Adult Basic Education; Computer Software Selection; *Content Area Reading; Courseware; Curriculum Development; Educational Technology; Fine Arts; *High School Equivalency Programs; *Instructional Innovation; Literature; *Optical Disks; *Reading Instruction; Reading Skills; Sciences; Social Studies
IDENTIFIERS	General Educational Development Tests

ABSTRACT

A project developed a planned course of study using laser disc software to enhance social stud es, science, and literature and the arts in Adult Basic Education (ABE)/General Educational Development (GED) reading classes. During the first part of the project, laser disc software was reviewed to ascertain what material was compatible with the ABE/GED reading curriculum used in the classes. During the second part, the laser disc software that complimented the reading materials was used with 25 ABE/GED students. The instructional approach to using the materials offered two basic options: to review reading passages and then view the corresponding material on the laser disc software or to use the laser disc software concurrently with the reading passages. Pre- and posttests were administered to allow comparison of these students with those taught with traditional methods. Students responses were positive. Appendixes to the 22-page report include the following: pre- and postprogram questionnaire with student responses; lesson plans for six laser disc units on biology, earth science (two units), geography, chemistry/physics, and political science; and a listing of supplemental reading and exercises for the units. (Contains 16 references.) (YLB)

Final Report

Laser Disc Technology: A Visual Approach to Reading

Barbara A. Goss, Project Coordinator/Instructor
Carol Molek, Project Director

1992-1993

June 30, 1993

Tuscarora Intermediate Unit
Adult Education and Job Training Center
3 West Monument Square, Suite 103
Lewistown, PA 17044

717-248-4942

98-3028 - $15,220

The activity which is the subject of this report was supported in part by the U.S. Department of Education. However, the opinions expressed herein do not necessarily reflect the position or policy of the U.S. Department of Education or the Pennsylvania Department of Education, and no official endorsement should be inferred.

Acknowledgements

We wish to thank the Pennsylvania Department of Education for funding this project and especially Dr. John Christopher, Director, Bureau of Adult Basic and Literacy Education for his support of our programs.

We also extend gratitude to PDE Special Projects Advisor, Dan Partin, for his technical assistance and guidance. Funding for "Laser Disc Technology: A Visual Approach to Reading" has allowed us to enhance and develop our programming and delivery of much needed services to our area's adults and has also allowed us to involve our students with high technology instruction in the adult classroom.

As always we value the support of the Tuscarora Intermediate Unit Board and our Executive Director, Dr. Dale Heller. The Intermediate Unit continues to recognize our unique contribution to the total organization.

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Abstract

Title: Laser Disc Technology: A Visual Approach to Reading
Project No. 98-3028
Director: Carol Molek
Agency Address: TIU Adult Education and Job Training Center
3 Monument Square, Suite #103
Lewistown, PA 17044 **Phone No.** 717-248-4942
Funding: $15,220

Description:

"Laser Disc Technology: A Visual Approach to Reading" developed a planned course of study using laser disc software to enhance the study of Social Studies, Science, and Literature and the Arts in our ABE/GED reading classes. By using the laser disc materials with the reading passages, we provided our students with an unusual learning experience to develop transferable skills for success on the GED test and in future learning situations.

Objectives:

-to develop a planned course of study that combines the laser disc software for Social Studies, Science, and Literature and the Arts with ABE/GED reading passages
-to use the laser disc software with ABE/GED reading planned course of study with 20 ABE/GED student

Target Audience:

Twenty-five ABE students who used the laser disc software/reading planned course of study. This entire project can be adopted by other adult educators into their own ABE/GED programs.

Product:

A final report that documents the successes of the entire project and that includes the planned course of study.

Method of Evaluation:

A positive evaluation was based on:
-development of a planned course of study that combines laser disc software with ABE/GED reading curriculum
-production of a final report that includes the planned course of study

Findings:

The 25 ABE students that were served by this project had the opportunity to be involved with an exceptional method of reading instruction. The students responded very positively. Laser disc instruction added a unique, visual dimension of learning to the ABE reading curriculum.

Conclusions:

We would recommend that other adult educators consider adopting the use of the laser disc curriculum into their own ABE/GED programs. Although the cost of the hardware and the software may seem prohibitive, funding may be available through various means and pooling community educational resources may be practical. The curriculum can be easily adapted to any ABE/GED program, and both students and instructors will benefit greatly. Any adult educator who would use this laser disc curriculum in his/her own ABE/GED program would find this an inspiring experience and certainly would not be disappointed with the results.

Laser Disc Technology: A Visual Approach to Reading

INTRODUCTION

"Laser Disc Technology: A Visual Approach to Reading" addressed priority B.3 - curriculum designed for statewide impact.

This proposal addressed a desire to develop a planned course of study to enhance the study of Social Studies, Science, and Literature and the Arts in Adult Basic Education reading classes.

Laser disc technology, commonly referred to as interactive video, uses the same basic technology as the compact disc - amplification of light waves that are concentrated into a penetrating beam. The laser disc is about the size of a 33 1/3 phonograph record and requires a special player, similar to the compact disc player. The laser disc player is necessary to play the laser disc, but the image can be projected onto any television screen.

The entire laser disc technology added an important dimension to understanding the basics of Social Studies, Science, and Literature and the Arts. The visual experience of the laser disc coupled with the reading passages in these subject areas provided our students with the basics they felt they lacked and also gave them more security and confidence as they prepared for the GED test.

A 353 project using laser disc technology was completed in 1989-1990 by Vince Nedimyer, Director, at the Community Education Center in Altoona. This particular project provided an important foundation for our project. The 353 project - "A Study of CA/CV Laser Disk Technology in the Adult Classroom" combined laser disc software with the Apple computer and mathematics software. This was not the intent of this proposal. We did not use the laser disc reading software with the computer. We used the laser disc software in reading classes to enhance the study of Social Studies, Science, and Literature and the Arts. Actually, these two projects complimented each other, with our laser disc project exploring a different use of the laser disc software.

As adult educators, we need to be constantly aware of the changing world of instruction available in the educational market. In all aspects of education, high technology is consistently being incorporated into educational curriculums and classroom instruction. By means of this proposal, our Adult Basic Education students had the opportunity to be exposed to educational instruction by means of high technology. Not only did we enhance the ABE/GED reading instruction, but we also provided a means for our students to be comfortable and not intimidated when exposed to high technology.

Laser disc technology proved to be an excellent instructional vehicle. The laser disc materials available for Social Studies, Science, and Literature and the Arts instruction deal with much of the exact information we read about and study in ABE/GED reading classes. By using the laser disc materials with the reading exercises, we provided our students with an opportunity for an exceptional learning experience. This learning experience is transferable to success on the GED test and success in future learning situations for our students. By utilizing laser disc technology, we also provided our visual learners with an enhanced educational experience.

Throughout the 1992-1993 year, ABE/GED students have been involved with this project. The time frame for project activities follows:

July '92 - January '93 - Research and development of planned course of study combining laser disc software with ABE/GED reading passages.

December '92 - April '93 - Use of planned course of study with 20 ABE students (actual number served - 25 ABE students).

April '93 - May '93 - Curriculum revision

June '93 - Final report

The project director was Carol Molek. Ms. Molek directs programs at the TIU Adult Education and Job Training Center. Ms. Molek has over nine

years experience coordinating adult programs for the Intermediate Unit and developing curriculum. Ms. Molek directed the project, supervised the other personnel involved, was responsible for maintaining the planned time frame, recruited program participants and reported to and communicated with the Department. The project coordinator was instructor, Barbara A. Goss. Ms. Goss has been an ABE instructor for seven years. She has worked on several 310/353 projects that have received statewide recognition. Ms. Goss was responsible for previewing the laser disc software to ascertain exactly what materials were compatible with the ABE/GED reading materials used in the classroom; developing the curriculum; and providing instruction and conducting follow-up activities.

The audience benefitting most from this project are our ABE students. Our students were exposed to the latest innovations in high technology instruction for the classroom. Instruction via the laser disc provided our students with the perfect opportunity to improve their skills in understanding basic reading concepts. The larger audience to benefit from this program are other adult educators statewide who can easily adopt this laser disc technology into their own ABE/GED programs to give their students a similar educational opportunity.

Permanent copies of this report can be obtained from:

Bureau of Adult Basic and Literacy Education Program
Pennsylvania Department of Education
333 Market Street
Harrisburg, PA 17126-0333

and

AdvancE
Pennsylvania Department of Education
333 Market Street
Harrisburg, PA 17126-0333

"Laser Disc Technology: A Visual Approach to Reading" was administered by the Tuscarora Intermediate Unit No. 11. The TIU is a local education agency which provides educational and management services to 9 school districts and 3 area vocational technical schools in Fulton, Huntingdon, Juniata, and Mifflin Counties.

The Intermediate Unit operates or oversees all Adult Center programs at the TIU Adult Education and Job Training Center. Center programs have included 322 ABE and GED programs; ACT 143 Program; the GED Alumni Association; various JTPA Programs; Carl Perkins project for single parents and displaced homemakers and thirty -seven 310/353 special projects.

"Laser Disc Technology: A Visual Approach to Reading" was based at the TIU Adult Education and Job Training Center in Lewistown, Mifflin County. The Adult Center is the home of a wide variety of adult education programs meeting the needs of adults in Juniata and MIfflin counties. February '93 marked the Adult Center's 9th year of successful operation.

Statement of Problem

"Laser Disc Technology: A Visual Approach to Reading" was designed to provide our Adult Basic Education students with a unique instructional means to enhance the study of Social Studies, Science, and Literature and the Arts in ABE/GED reading classes. Many of our students who attend ABE/GED reading classes have expressed their feelings of insecurity and lack of knowledge in understanding fundamental reading concepts especially in Social Studies and Science. They felt inadequate and fearful of being able to grasp basic ideas that they needed for competency in GED testing.

Upon attending a workshop that demonstrated the use of the laser disc in the classroom with Social Studies, Science, and Literature and the Arts materials, it was evident that laser disc software offered a unique, visual perspective for our students who attended our ABE/GED reading classes. By using the laser disc software with our ABE/GED students, we offered them a means of instruction that expanded and enhanced the reading curriculum that we use in ABE/GED reading classes. Reading instruction via the laser disc is a perfect means of instruction for the adult classroom because it is interactive. Also, the laser disc instruction coordinated well with a teacher in the classroom. It is anticipated that

the impact of this laser disc project will create enthusiasm among other adult educators. The laser disc reading curriculum can be easily adapted into any ABE/GED reading program with immediate success for the students.

Goals and Objectives

The goals of "Laser Disc Technology: A Visual Approach to Reading" were to enhance ABE/GED reading instruction, to expose our students to high technology instruction, and to promote an increased level of reading and thinking skills.

Objectives were:

-to develop a planned course of study that combines the laser disc software for Social Studies, Science, and Literature and the Arts with ABE/GED reading passages in these subjects.

-to use the laser disc software/reading course of study with 20 ABE/GED students (actual number served - 25 ABE students).

Procedures

The general design for "Laser Disc Technology: A Visual Approach to Reading" involved a basic two part plan.

Part I consisted of reviewing the Social Studies, Science, and Literature and the Arts laser disc software to ascertain exactly what material was compatible with the ABE/GED reading curriculum used in our classes. The reading texts and exercise books we are using for Social Studies, Science, and Literature and the Arts are from Contemporary publishers. Therefore, the laser disc software was matched specifically to Contemporary reading materials. We previewed materials from commercial vendors and utilized the laser software discs available through the TIU's media library. This part of the project required sufficient time to research the laser disc software. The research and development of this project was extremely important, and it provided a strong foundation for successful implementation with our ABE/GED students. We were fortunate to have the use of the TIU laser disc library and were at liberty to borrow laser discs as we needed them. Having that advantage, we did not need to purchase an extremely great amount of laser disc software.

Part II consisted of using the laser disc software along with the Contemporary materials with 25 ABE/GED students. Through our initial research, we found laser disc software that complimented our Contemporary reading materials (details of materials in bibliography).

Laser Disc Titles	Contemporary Reading Materials
1. Windows on Science (Earth Science) Earth Science Vol. 1; What Earth Science is All About	1. GED-Earth Science, Chapter 7, Pgs. 152-183 Pre-GED - Chapter 6, Pgs. 160-166
2. Physical Science, Vols. I, II, III: Physical and Chemical Changes, energy, work, matter, motion	2. GED - Physics, Chapter 9, Pgs. 221-257 Pre-GED - Chapter 4, Pgs. 96-107
3. Life Sciences: Human Biology, molecular, cell, plant, and animal biology National Zoo: Animal Biology	3. GED - Plant and Animal Biology, Chapter 5; Human Biology - Chapter 6, Pgs. 92-151 Pre-GED - Chapters 2 and 3
4. Chemistry at Work	4. GED - Chemistry, Chapter 8 Pgs. 184-220 Pre-GED - Chapter 5, Pgs. 129-159
5. Political Science: Power of the Supreme Court; the Congress; the President	5. GED - Political Science, Chapter 6, Pgs. 147-175
6. A perspective on America: Taking a look at American History	6. GED - U.S. History - Chapter 5, Pgs. 99-146 Pre-GED - Chapter 3, Pgs. 86-112

7. Literature: The Contribution of Man	7. GED - Literature and the Arts - Selections throughout the entire book Pre-GED - Critical Thinking and Reading Skills - Selections throughout the entire book

The instructional approach to using the materials offered two basic options: (1) to review reading passages and then view the corresponding material on the laser disc software or (2) to use the laser disc software concurrently with the reading passages. Since 353 projects are experimental and designed to try new methods of instruction and new materials for instruction, we tested both options. Observations were noted as to which method of presenting and using the material was most successful with our students.

Results

Objective # 1

- to develop a planned course of study that combines the laser disc software for Social Studies, Science, and Literature and the Arts with ABE/GED reading passages in these subjects.

This objective was successfully met. Laser disc software was reviewed and matched to the Contemporary reading materials we use in class for Social Studies, Science, and Literature and the Arts, and subsequently, the curriculum was developed.

- to use the laser disc software/reading course of study with 20 ABE/GED students.

This objective was accomplished by working with our students in class with the planned course of study. Twenty-five students had the opportunity to use the planned course of study in the specific areas of Biology, Earth Science (2 units), Geography, Chemistry/ Physics, and Political Science. The students reacted to the materials very favorably. We saw an increased interest in these sometimes very difficult and confusing subject areas. The students' understanding of the basic concepts and the vocabulary in these

subject areas definitely increased. Our goal was to enable the students to feel more secure, to have more knowledge, and to erase their feelings of inadequacy in the reading subjects. This was successfully accomplished! Students were definitely enthusiastic about being exposed to laser disc instruction.

At this point in the project, the actual measurement of the students' successes will most likely be determined when GED testing is completed. It is at this time, when we see real numbers from the actual GED test scores, that we will be able to determine if the laser disc instruction did, in fact, increase our students' understanding of the basic concepts and the vocabulary in the areas of Social Studies, Science, and Literature and the Arts. From our observations of our students in reading class, we are encouraged that they will be especially successful when they test for their GED.

Evaluation

Evaluation of this project was a continual process. All objectives were successfully met within the time frame of the project. Measurement of success was based on:

(a) the development of a planned course of study that combined laser software for Social Studies, Science, and Literature and the Arts with ABE/GED coordinated reading passages.

The planned course of study was developed It successfully combined the laser disc software with ABE/GED coordinated reading passages in the specific reading areas of Biology, Earth Science (2 units), Geography, Chemistry/ Physics, and Political Science.

(b) the use of the laser disc software/reading planned course of study with 20 ABE students. A pre-test and a post-test was administered to the ABE/GED reading classes to ascertain a comparison of the use of the laser disc materials to traditional methods.

Twenty-five ABE students were served by this project. We had originally planned to use the laser disc curriculum with 20 ABE students, but we were fortunate enough to offer this instruction to

a few more students than anticipated. A pre-test was administered to each student before we began using the laser disc curriculum. The post-test was also administered. Unfortunately, as often happens in our ABE/GED classes, not all of the students completed the reading classes and therefore, did not participate in the post-test. The results of both the pre-test and the post-test are included in the appendices of this report.

Dissemination

This project will be available for dissemination through:

Bureau of Adult Basic & Literacy Education Programs
Pennsylvania Department of Education
333 Market Street
Harrisburg, PA 17126-0333

and

AdvancE
Pennsylvania Department of Education
333 Market Street
Harrisburg, PA 17126-0333

Specific questions should be directed to:

Carol Molek
Adult Education and Job Training Center
3 West Monument Square, Suite 103
Lewistown, PA 17044-0103
(717) 248-4942

Conclusions/Recommendations

"Laser Disc Technology: A Visual Approach to Reading" was a project that was specifically designed to help students who attended ABE/GED reading classes have the opportunity to be exposed to educational instruction using laser disc software with a planned course of study for reading. Every aspect of this project was a success. Not only did this project offer an interesting visual perspective for all our students, but it also provided a special plus for our visual learners. One very positive outcome of this project was the increased communication among the class members. Studying the vocabulary and using the activities associated with the different units provided the perfect opportunity for students to communicate with each other and the instructor. The activities were designed so that they could be done either by the individual student or in pairs or small groups. As the students worked in pairs or in small groups, it became evident almost immediately that the students were enjoying exchanging information and working on the activities. Any time increased communication is part of the result of a project, the project is enhanced and the students gain in every respect.

Another very positive outcome of this project was the confidence we saw our students acquire in understanding basic reading concepts

especially in Social Studies and Science. Instead of feeling inadequate and insecure about being able to deal with and to grasp basic concepts in Social Studies and Science, they were confident and their self-esteem automatically increased. One student remarked, "I never thought I would be able to understand anything about chemistry and physics. They scared me! Now that I know a few things, I think I will be able to do better than I thought I would on my GED test." A third positive outcome of this project was an opportunity for our students to increase their critical thinking skills. The exercises that accompanied the units gave our students the chance to get involved in activities that allowed them to fine tune their critical thinking skills and to make those skills sharper and more useful.

The use of the laser disc for instructional purposes carries with it some inherent problems. Educators who are considering using this method of instruction need to be aware of these particular concerns. One problem concerns the fact that using laser disc software requires a special player. The player is the size of a VCR and costs approximately $600.00. A second problem concerns the extremely high cost of the laser disc software. The software we purchased cost an average of $1,800.00 per package. The software we purchased is listed in the bibliography. That software is marked with an asterisk.

ABE/GED instructors who are considering using laser disc instruction in the classroom should not be discouraged by the problems that accompany this method of instruction. There are solutions! One possible solution is to connect with the local Intermediate Unit and check into the possibility of borrowing not only the laser disc player but the laser software. When we originally began this project, we used our Intermediate Unit's library, and we borrowed laser software to preview. We eventually purchased our own software, but the availability of the materials from the IU library was a tremendous help in giving us a place to begin. Another possible connection for laser software/equipment is the local school districts. These resources may be readily available, and this may provide an excellent opportunity to establish a working relationship with your local school district. A possible source for funding to purchase laser disc software/equipment would be to link with a JTPA program.

We were extremely fortunate to receive an extra $3,000.00 from the Department of Education for this project during the project year. With that funding, we were able to purchase additional software that will allow us to serve a wider range of clients. Also, without that additional funding, we would not have been able to purchase the amount of laser disc software that we did. We want to extend our thanks to the Department for

giving us the opportunity to serve our clients in a more complete way.

As a result of our using the laser disc planned course of study with our students, we would highly recommend that other adult educators consider adopting the use of the laser disc curriculum into their own ABE/GED programs. The laser disc curriculum can be easily adapted to any ABE/GED program, and both students and instructors will benefit greatly. This project proved to be a very worthwhile venture, and every minute spent working on this project was interesting. It was a pleasure to work on a project that generated such enthusiasm from the students. Any adult educator who would adopt the laser disc curriculum and use it with his/her own ABE/GED reading program would not be disappointed!

We are extending an open invitation to any adult educators who wish to see the laser disc software in use to consider visiting our educational site for a demonstration. Even though this project was extremely interesting and stimulating to work with, words simply do not do justice to the project. It is difficult to envision the laser disc software and what it is capable of doing without actually seeing it. Inquiries may be directed to Carol Molek.

APPENDICES

PRE/POST LASER DISC QUESTIONNAIRE

"Laser Disc Technology: A Visual Approach to Reading"

Pre-Instructional Questionnaire

	Not at All									Very
1. How familiar are you with the term laser disc?	1	2	3	4	5	6	7	8	9	10
2. How familiar are you with instruction in the classroom using laser disc technology?	1	2	3	4	5	6	7	8	9	10
3. How interesting do you think laser disc instruction will be?	1	2	3	4	5	6	7	8	9	10
4. How comfortable do you think you will be with instruction using laser disc technology?	1	2	3	4	5	6	7	8	9	10
5. Do you think you are a visual learner?	1	2	3	4	5	6	7	8	9	10
6. Laser disc instruction provides a visual dimension to learning. Do you think you will learn more from the visual instruction of the laser disc?	1	2	3	4	5	6	7	8	9	10
7. Do you think that seeing certain Social Studies concepts with laser disc instruction in addition to reading about them will increase your ability to understand Social Studies?	1	2	3	4	5	6	7	8	9	10
8. Do you think that seeing certain Science concepts with laser disc instruction in addition to reading about them will increase your ability to understand Science?	1	2	3	4	5	6	7	8	9	10
9. Do you think that seeing information relating to Literature and the Arts in addition to reading about it will increase your ability to understand Literature?	1	2	3	4	5	6	7	8	9	10
10. Please rate your general overall feeling about instruction using the laser disc technology.	1	2	3	4	5	6	7	8	9	10

"Laser Disc Technology: A Visual Approach to Reading"

Post-Instructional Questionnaire

	Not at All									Very
1. How familiar are you with the term laser disc?	1	2	3	4	5	6	7	8	9	10
2. How familiar are you with instruction in the classroom using laser disc technology?	1	2	3	4	5	6	7	8	9	10
3. How interesting did you think laser disc instruction was?	1	2	3	4	5	6	7	8	9	10
4. How comfortable were you with the instruction using laser disc technology?,	1	2	3	4	5	6	7	8	9	10
5. Do you think you are a visual learner?	1	2	3	4	5	6	7	8	9	10
6. Laser disc instruction provides a visual dimension to learning. Did you think you learned more from the visual instruction of the laser disc?	1	2	3	4	5	6	7	8	9	10
7. Did you think that seeing certain Social Studies concepts with laser disc instruction in addition to reading about them increased your ability to understand Social Studies?	1	2	3	4	5	6	7	8	9	10
8. Did you think that seeing certain Science concepts with laser disc instruction in addition to reading about them increased your ability to understand Science?	1	2	3	4	5	6	7	8	9	10
9. Did you think that seeing information relating to Literature and the Arts in addition to reading about it increased your ability to understand Literature?	1	2	3	4	5	6	7	8	9	10
10. Please rate your general overall feeling about instruction using the laser disc technology.	1	2	3	4	5	6	7	8	9	10

PRE/POST LASER DISC QUESTIONNAIRE WITH STUDENT RESPONSES

"Laser Disc Technology: A Visual Approach to Reading"

Pre-Instructional Questionnaire

	Not at All									Very
1. How familiar are you with the term laser disc?	1	2	3	4	5	6	7	8	9	10
Student Responses:	**10**	**4**	**3**					**1**		**2**
2. How familiar are you with instruction in the classroom using laser disc technology?	1	2	3	4	5	6	7	8	9	10
Student Responses:	**18**	**2**								
3. How interesting do you think laser disc instruction will be?	1	2	3	4	5	6	7	8	9	10
Student Responses:					**5**	**3**	**3**	**3**	**2**	**4**
4. How comfortable do you think you will be with instruction using laser disc technology?	1	2	3	4	5	6	7	8	9	10
Student Responses:		**1**			**6**	**2**	**2**	**3**		**6**
5. Do you think you are a visual learner?	1	2	3	4	5	6	7	8	9	10
Student Responses:		**1**	**1**	**1**	**2**	**1**	**3**	**3**	**3**	**5**
6. Laser disc instruction provides a visual dimension to learning. Do you think you will learn more from the visual instruction of the laser disc?	1	2	3	4	5	6	7	8	9	10
Student Responses:				**1**	**6**	**1**	**1**	**4**	**3**	**4**
7. Do you think that seeing certain Social Studies concepts with laser disc instruction in addition to reading about them will increase your ability to understand Social Studies?	1	2	3	4	5	6	7	8	9	10
Student Responses:				**1**	**4**	**2**	**2**	**3**	**4**	**4**
8. Do you think that seeing certain Science concepts with laser disc instruction in addition to reading about them will increase your ability to understand Science?	1	2	3	4	5	6	7	8	9	10
Student Responses:					**3**	**3**	**4**	**3**	**3**	**4**
9. Do you think that seeing information relating to Literature and the Arts in addition to reading about it will increase your ability to understand Literature?	1	2	3	4	5	6	7	8	9	10
Student Responses:				**2**	**1**	**3**	**1**	**4**	**4**	**5**
10. Please rate your general overall feeling about instruction using the laser disc technology.	1	2	3	4	5	6	7	8	9	10
Student Responses:					**6**		**4**	**3**	**2**	**5**

"Laser Disc Technology: A Visual Approach to Reading"

Post-Instructional Questionnaire

	Not at All									Very
1. How familiar are you with the term laser disc?	1	2	3	4	5	6	7	8	9	10
Student Responses:				**4**			**2**			**5**
2. How familiar are you with instruction in the classroom using laser disc technology?	1	2	3	4	5	6	7	8	9	10
Student Responses:			**1**	**1**	**1**			**3**	**4**	
3. How interesting did you think laser disc instruction was?	1	2	3	4	5	6	7	8	9	10
Student Responses:			**1**		**1**		**2**		**2**	**4**
4. How comfortable were you with the instruction using laser disc technology?	1	2	3	4	5	6	7	8	9	10
Student Responses:			**1**	**1**	**2**					**6**
5. Do you think you are a visual learner?	1	2	3	4	5	6	7	8	9	10
Student Responses:				**1**	**1**	**2**	**1**	**2**	**2**	**1**
6. Laser disc instruction provides a visual dimension to learning. Did you think you learned more from the visual instruction of the laser disc?	1	2	3	4	5	6	7	8	9	10
Student Responses:			**1**	**1**	**1**		**1**	**2**	**2**	**2**
7. Did you think that seeing certain Social Studies concepts with laser disc instruction in addition to reading about them increased your ability to understand Social Studies?	1	2	3	4	5	6	7	8	9	10
Student Responses:				**2**	**1**		**2**	**3**	**1**	**1**
8. Did you think that seeing certain Science concepts with laser disc instruction in addition to reading about them increased your ability to understand Science?	1	2	3	4	5	6	7	8	9	10
Student Responses:			**1**		**2**		**1**	**1**	**3**	**2**
9. Did you think that seeing information relating to Literature and the Arts in addition to reading about it increased your ability to understand Literature?	1	2	3	4	5	6	7	8	9	10
Student Responses:			**1**	**1**	**1**			**3**	**3**	**1**
10. Pleas\ ate your general overall feeling about instruction using the laser disc technology.	1	2	3	4	5	6	7	8	9	10
Student Responses:				**1**	**1**	**1**	**1**		**3**	**3**

LASER DISC UNIT #1 - BIOLOGY

Laser Disc Unit #1 - Biology

LASER DISC SOFTWARE - LIFE SCIENCES SIDES 7 & 8
Optical Data Corporation

General Content: Mechanisms of stability and change
2 Laser Discs; Lesson Guide

1. Chapter 17 - Biomes Directory/Distribution
   (start) 1751 - 1765

2. Side 7 - Movies
   - Chapter 20 - Photosynthesis
   - Chapter 33 - Fetal Development
   - Chapter 35 - Structure of DNA
   - Chapter 36 - Methods of Observing DNA
   - Chapter 42 - Genetic Engineering with Agrobacteria

3. Side 8 - Movies
   - Chapter 25 - Energy Pyramid
   - Chapter 35 - Global Temperature Changes
   - Chapter 36 - Predator and Prey on the Tundra
   - Chapter 37 - Tundra
   - Chapter 38 - Coniferous Forest
   - Chapter 39 - Deciduous Forest
   - Chapter 40 - Grasslands
   - Chapter 41 - Savannah
   - Chapter 42 - Desert
   - Chapter 43 - Life in the Desert
   - Chapter 44 - Tropical Rain Forest

4. Laser Disc software is used with the following reading materials:
   Contemporary's Building Basic Skills in Science -
   Unit I: Biology Pages 15 - 47

   Contemporary's GED Science Exercise Book -
   Plant and Animal Biology Pages 3 - 14
   Human Biology Pages 15 - 29

The following information is taken from the laser disc software package:
THE LIVING TEXTBOOK: MECHANISMS OF STABILITY AND CHANGE. OPTICAL DATA CORPORATION, WARREN, N.J., 1980, PP. 15, 23, 24, 28.

1745 Predation; timber rattlesnake eating mouse
1746 Predation; lioness carrying fawn
1747 Predation; wildebeest carcass
1748 Predation; carcass
1749 Predation; skull
1750 Metamorphosis; leafhopper shedding; cicadellidae; Daniel Lee Brown

CHAPTER 17

1751 BIOMES DIRECTORY
1753 DISTRIBUTION
1754 Biosphere; labeled diagram
1755 World biome distribution; labeled diagram
1756 World biome distribution; unlabeled diagram
1757 North American biome; tundra; diagram
1758 North American biome; coniferous forest; diagram
1759 North American biome; deciduous forest; diagram
1760 North American biome; grassland; diagram
1761 North American biome; desert; diagram
1762 North American biome; tropical forest; diagram
1763 Biome; distribution along Earth's latitudes; labeled diagram
1764 Biome; distribution along elevation in North America; labeled diagram
1765 Rainshadow effect; creating deserts in North America; labeled diagram

1766 TUNDRA
1767 Tundra; scenic; snow covered
1768 Tundra; scenic; Manitoba, Canada
1769 Tundra; plants; Grizzlies in a field
1770 Tundra; scenic; Mount McKinley
1771 Tundra; plants; Yukon
1772 Tundra; plants; Denali National Park
1773 Tundra; plants; view from Primrose
1774 Tundra; plants; moose in Denali National Park
1775 Tundra; scenic; glacial valley
1776 Tundra; scenic; glacial carved mountains
1777 Tundra; permafrost
1778 Tundra; scenic; summer ice and snow
1779 Tundra; herbivore; ground squirrel
1780 Tundra; plants; arctic bluebells
1781 Tundra; plants; white evicaceae with blueberries
1782 Tundra; plants; shooting star flowers
1783 Tundra; plants; lousewort
1784 Tundra; plants; moss campian
1785 Tundra; plants; yellow tundra flower
1786 Tundra; plants; wildflower
1787 Tundra; plants; wildflower
1788 Tundra; plants; wildflower
1789 Tundra; herbivore; mammal; arctic ground squirrel
1790 Tundra; herbivore; mammal; hoary marmot
1791 Tundra; herbivore; mammal; Denali Dall rams; *Ovis dalli*
1792 Tundra; herbivore; mammal; Denali Dall ram; *Ovis dalli*
1793 Tundra; herbivore; mammal; Dall sheep; *Ovis dalli*
1794 Tundra; herbivore; mammal; caribou; Alaska
1795 Tundra; herbivore; mammal; caribou bull; Denali
1796 Tundra; herbivore; mammal; caribou in willows
1797 Tundra; herbivore; mammal; Alaskan musk ox
1798 Tundra; herbivore; mammal; snowshoe rabbit; summer coat
1799 Tundra; carnivore; mammal; Alaskan gray wolf digging for ground squirrels
1800 Tundra; carnivore; mammal; Alaskan gray wolf

1837 Coniferous forest; herbivore; mammal; California vole; *Microtus californicus*; CA; Daniel Lee Brown
1838 Coniferous forest; herbivore; mammal; golden-mantled ground squirrel; *Spermophilus lateralis*; OR
1839 Coniferous forest; herbivore; mammal; California ground squirrel; *Spermophils beecheyi*; CA; Daniel Lee Brown
1840 Coniferous forest; herbivore; mammal; mountain goat with kid; Montana
1841 Coniferous forest; herbivore; mammal; mountain goats; *Oreamnos americanus*; Montana
1842 Coniferous forest; herbivore; mammal; bighorn sheep; *Ovis canadensis*; Alberta, Canada
1843 Coniferous forest; herbivore; mammal; bighorn sheep; *Ovis canadensis*; Montana
1844 Coniferous forest; herbivore; mammal; mule deer with census tags; *Odocoilius hemionus;* Sierraville, CA
1845 Coniferous forest; herbivore; mammal; mule deer; *Odocoilius hemionus*
1846 Coniferous forest; herbivore; mammal; moose; *Aices aices*; cow with calf; Wyoming
1847 Coniferous forest; herbivore; mammal; moose; *Aices aices*
1848 Coniferous forest; herbivore; mammal; moose; *Aices aices*
1849 Coniferous forest; herbivore; mammal; bull elk; *Cervus canadensis*; WY
1850 Coniferous forest; carnivore; mammal; cougar; *Felis concolor*
1851 Coniferous forest; carnivore; mammal; cougar; *Felis concolor*
1852 Coniferous forest; carnivore; mammal; bobcat; *Lynx rufus;* NJ
1853 Coniferous forest; carnivore; mammal; short tail weasel; *Mustela erminea*
1854 Coniferous forest; carnivore; mammal; pine marten; *Martes americana*; CA; Daniel Lee Brown
1855 Coniferous forest; omnivore; mammal; brown bear; *Ursus arctos*; AL
1856 Coniferous forest; omnivore; mammal; black bear; *Ursus americans*; MN
1857 Coniferous forest; omnivore; mammal; skunk
1858 Coniferous forest; herbivore; bird; mountain bluebird; *Sialia currucoides*
1859 Coniferous forest; herbivore; bird; Anna's hummingbird; *Calypte anna*; male; CA; Daniel Lee Brown
1860 Coniferous forest; herbivore; bird; Anna's hummingbird; *Calypte anna*; female on nest; CA; Daniel Lee Brown
1861 Coniferous forest; herbivore; bird; Anna's hummingbird; *Calypte anna*; female feeding young; CA; Daniel Lee Brown
1862 Coniferous forest; herbivore; bird; broad-tailed hummingbird and bee; *Selasphorus platycercus*; Daniel Lee Brown
1863 Coniferous forest; herbivore; bird; broad-billed hummingbird; *Cynanthus latirostris*; male feeding; Daniel Lee Brown
1864 Coniferous forest; carnivore; bird; American dipper; *Cinclus mexicanus*; CA; Daniel Lee Brown
1865 Coniferous forest; carnivore; bird; endangered; spotted owl; *Strix occidentalis*; CA; Daniel Lee Brown
1866 Coniferous forest; carnivore; bird; short-eared owl; *Asio flammeus*
1867 Coniferous forest; carnivore; bird; bald eagle; *Haliaeetus leucocephalus*; CA; Daniel Lee Brown
1868 Coniferous forest; carnivore; bird; mountain chickadee; *Parus gamell*; CA; Daniel Lee Brown

SIDE 7 MOVIES

CHAPTER 20
PHOTOSYNTHESIS

In the chloroplasts of all plants the sun's energy is converted into chemical energy through the process of photosynthesis.

In each thylakoid, shown in green, are two light-reaction centers called photosystems. Each photosystem directs the sun's energy into its specialized molecule of chlorophyll, either P700 or P680.

First, photosystem II absorbs water and light. P680 is energized as light is funneled to it. P680 then ejects electrons and absorbs replacement electrons from water. This process splits water, releasing oxygen gas and hydrogen ions.

Meanwhile, the energized P680 electron is passed to photosystem I. During this process ADP is changed to ATP which stores energy.

When the electron from P680 reaches photosystem I, P700 absorbs light energy, freeing an electron. This electron drives the synthesis of NADPH from NADP+.

This whole process, called the light reactions, produces NADPH and ATP. These are used as energy sources fueling the dark reactions. Both dark and light reactions occur during daylight hours. However, the dark reactions don't require light.

The dark reactions, also called the Calvin cycle, occur in the stroma, outlined in grey. Carbon dioxide enters the cycle and is fixed to RuBP. Energy from NADPH and ATP fuels a series of reactions that produces a three-carbon compound. Some of this compound is used to produce glucose and other sugars.

Using more of the ATP energy, the remainder of the three-carbon compound is reformed into RuBP and the cycle begins again.

Photosynthesis is a simple oxidation/reduction reaction and is one of the most important processes on Earth. Almost all life is dependent upon it.

CHAPTER 23
BLOOD PRESSURE

With every heartbeat your blood is pumped into the body's major artery, the aorta. From there it flows into smaller and smaller arteries that extend throughout your body. Your blood, as it travels through this intricate network, exerts force against the walls of the vessels.

This force is what we call blood pressure. As the vessels become smaller, resistance to blood flow increases and more pressure is created, much like tightening a nozzle on a hose. The amount of this resistance, combined with the speed and force of your heartbeat and the volume of blood circulating through your body, determine your blood pressure.

If you don't already know what your blood pressure is, make a commitment to find out.

Measuring your blood pressure is a painless procedure involving a device known as a sphygmomanometer. A sphygmomanometer expresses your blood pressure in two numbers, the systolic and diastolic measurements.

The systolic reading measures your blood pressure at its highest point when your heart contracts, pumping blood into your arteries. The diastolic measurement is your pressure when your heart is relaxed, letting blood flow back in.

A blood pressure reading of 120 over 80, for instance, means your systolic pressure is 120 and your diastolic is 80.

Blood pressure readings consistently above 140 over 90 are considered hypertensive.

SIDE 8 MOVIES

CHAPTER 20
ADAPTATION
Many species of birds have specially adapted beaks that make obtaining food easier or more efficient. If an adaptation helps the bird survive and produce more progeny, it is said to be more fit. Over time, survival of the fittest may lead to the evolution of a new species.

CHAPTER 21
LUCY
Somewhere in eastern Africa, near Hadar, Ethiopia in the Afar triangle, about 3.5 million years ago, a hominid walked the earth.

Her fossilized remains were discovered by scientists who nicknamed her Lucy. Her proper name is *Australopithecus afarensis*. At the time of her discovery she was described as the oldest hominid ancestor. All the fossils found there help tell a story of her life.

The short, carpal bones of her fingers tell us she had dexterous hands with opposing thumbs and fingers. This gave her the capability of fine manipulation necessary for tool use.

Lucy had a protruding face and a small skull. Her brain must have been small, as well.

She lived in the middle of a grassland, near a freshwater lake. Aquatic plants, such as typhus and bulrushes were abundant. She shared her home with other animals such as the water buck, turtle and crocodile.

Her skeleton suggests an upright posture. Footprints show she walked on two legs, using a heel-to-toe motion. As a full grown adult she stood about one meter high and weighed about 25 kilograms.

Lucy's non-specialized teeth show her diet was mixed. It included vegetation, which she ate using her front teeth, as well as small crabs and rodents. She may even have eaten crocodile eggs.

Perhaps a carnivore ended Lucy's life. A tooth mark found on her fossil bones suggests this.

As scientists study Lucy and her relatives, the story will continue to unfold.

CHAPTER 22
DIG AT SITE 333
Eastern Africa is the site of many fossil discoveries. Hadar in Ethiopia, Laetoli in Tanzania and the Olduvai Gorge are well-known places of fossil exploration.

Teams of many different scientists come here in hopes of finding clues to the past preserved in the sediment.

At site 333, digging can be tedious, but all involved must be meticulous and keep a sharp eye out for clues. Significant fossil discoveries may be as small as a single tooth.

We have the femur! And the foot! And the knee! It's a big individual, as big as modern day man.

All of the work does not take place in the field. Once they are collected, the fossils must be tagged and organized according to where they were found. Fossils of plants and animals found in the area are important for recreating an entire ecosystem.

After the dig, the fossils are taken to the lab where more specialists put the pieces together. Sometimes parts are reconstructed to make a clearer picture. When all has been considered, the species is placed in a possible lineage where it remains until new discoveries change the perspective.

Now with the discovery of *Australopithecus afarensis*, the skeleton known as Lucy and her relatives from eastern Africa, particularly from Ethiopia but also from Laetoli, we have a form which now occupies the position that *Australopithecus africanis* previously occupied. It can now be placed, I think, without very many reservations as a common ancestor for this line which we will call Australopithecus and this line which we'll call Homo which ultimately led to modern humans.

Australopithecus afarensis serves as the source for the Australopithecine and Homo lines. *Homo habilis* and *Homo erectus* are on the same branch as *Homo sapiens*. This means that Lucy and her relatives may be the oldest known ancestor of modern man.

LASER DISC UNIT #2 - EARTH SCIENCE

Laser Disc Unit # 2 - Earth Science

LASER DISC SOFTWARE - EARTH SCIENCE VOL. II - Chapters 23-34
Optical Data Corporation

General Content: Studying star light, galaxies, the sun
Laser disc, resources, lessons

1. Our Sun
   Chapter 24 - (start) 17515 - 17522
   Chapter 25 - 17523 - 18487 All
   Chapter 26 - 18488 - 19404 All

2. What is the Sun?
   Chapter 27 - 19405 - 19544 All

3. Surface Features
   Chapter 29 - 19883 All
   Chapter 30 - 20133 All
   Chapter 31 - 20323 Only

4. Back on Earth
   Chapter 32 - 20507 Only

5. Illustrated Glossary
   Chapter 33 - 21598 - 21680 All

6. Laser Disc software is used with the following reading materials:

   Contemporary's Building Basic Skills in Science -
   Unit II: Earth Science Pages 52 - 74

   Contemporary's GED Science Exercise Book -
   Earth Science Pages 30 - 37

The following information is taken from the laser disc software package: KENNETH C. REILEY, ED., WINDOWS ON SCIENCE: EARTH SCIENCE VOL. II, OPTICAL DATA CORPORATION, WARREN, N.J., 1990. LESSON MANAGER: PP. 43 AND 44. RESOURCES: PAGES ARE NOT NUMBERED.

VOCABULARY

These words are used in context in the Video Lesson and appear in the Illustrated Glossary.

solar
photosphere
chromosphere
corona
yellow star
blue star
red star
core
fusion
convection
sunspots
solar prominence
solar flare
solar eclipse
umbra
partial solar eclipse
solar eclipse
totality

CHAPTER 24

17514 UNIT MENU
17515 OUR SUN

The sun, a star

17516 Stars in a nebula; Eagle Nebula
17517 Solar system; diagram
17518 Sun - Earth; relative sizes; diagram
17519 Tropical sunset over the ocean
17520 Melting ice cream cone,
17521 Sunrise over a mountain
17522 Sunbathing at the ocean

CHAPTER 25

17523 Narrated movie: *"Growth of a Pea Seed"*; time-lapse motion; 40 seconds duration
18487 Sun and silhouetted trees; view with a small telescope

CHAPTER 26

18488 Narrated movie: *"Observing the Sun"*; 38 seconds duration
19404 Projecting the sun's image with binoculars

What is the sun?

CHAPTER 27

19405 Silent movie: *"Solar Rotation"*; view of the X-rays given off by the sun; 5 seconds duration
19530 Layers of the sun; unlabeled diagram
19531 Layers of the sun; temperatures labeled; diagram
19532 Layers of the sun; photosphere; labeled diagram
19533 Sun's photosphere
19534 Layers of the sun; photosphere and chromosphere; labeled diagram
19535 Solar eclipse; chromosphere
19536 Layers of the sun; photosphere, chromosphere, corona; labeled diagram
19537 Solar eclipse; corona
19538 Winter night sky; stars with color; diagram
19539 Colored stars' temperatures; diagram

How does the sun work?

19540 HOW DOES THE SUN WORK?
19541 Layers of the sun; photosphere, chromosphere, corona and core; labeled diagram
19542 Hydrogen atoms compressed; diagram
19543 Fusion; two hydrogen atoms combining to yield helium plus energy; diagram
19544 Fusion; labeled diagram

CHAPTER 28

19545 Narrated movie: *"Sun's Surface"*; 14 seconds duration
19873 Convection; sun's surface and core; diagram
19874 Convection; sun's surface and core; labeled diagram

Surface features

19875 Sun; sunspots on the photosphere
19876 Sunspot; close-up
19877 Solar astronomer recording sunspots
19878 Activity: Sunspot predictions
19879 Activity: Sunspot predictions; one point plotted on the graph
19880 STEP FORWARD FOR ANSWER
19881 Activity: Sunspot predictions; completed graph; answer
19882 Sun; very large solar prominence

CHAPTER 29

19883 Silent movie: *"Solar Prominence"*; 8 seconds duration

CHAPTER 30

20133 Silent movie: *"Solar Flare"*; 6 seconds duration

CHAPTER 31

20323 Silent movie: *"Seahorse Flare"*; 6 seconds duration
20488 Northern lights; aurora borealis

Back on Earth

20489 Solar radiation; amount of radiation striking Earth; diagram
20490 Orbits of the earth about the sun and the moon about the earth; diagram
20491 Solar eclipse; diagram
20492 Umbra; moon's shadow reaching Earth; labeled diagram
20493 Umbra; moon's shadow during a solar eclipse; labeled picture/diagram
20494 Umbra crossing U.S.; shadow moves eastward with time; satellite view; begin 6-frame sequence
20500 Partial solar eclipse; telescopic view

20501	Quarter eclipsing a person's face
20502	Quarter; close-up
20503	Quarter eclipsing the sun
20504	Total eclipse of the sun; corona and coronal streamers
20505	Total eclipse of the sun; sunset effects in Brandon, Manitoba, Canada
20506	Solar eclipse sequence; multiple exposure
	CHAPTER 32
20507	Silent movie: *"Solar Eclipse"*; 36 seconds duration

Review

21587	REVIEW
21588	Sun; photosphere
21589	Projecting the sun's image with binoculars
21590	Layers of the sun; photosphere, chromosphere, corona, core labeled; diagram
21591	Fusion; labeled diagram
21592	Sun; sunspots on the photosphere
21593	Sun; solar prominence
21594	Solar flare; Seahorse Flare
21595	Solar eclipse; orbits of Earth and moon; diagram
21596	THE END
21597	UNIT MENU

Illustrated Glossary

	CHAPTER 33
21598	ILLUSTRATED GLOSSARY Each vocabulary word is followed by an illustration, the definition, use in a sentence and the Spanish translation.
21599	Blue star
21600	Colored stars' temperatures; diagram
21604	Chromosphere
21605	Layers of the sun; labeled diagram
21609	Convection
21610	Convection; sun's core and surface; labeled diagram
21614	Core
21615	Layers of the sun; labeled diagram
21619	Corona
21620	Total solar eclipse; labeled picture/ diagram
21614	Fusion
21615	Fusion; labeled diagram
21629	Partial solar eclipse
21630	Moon partially blocking the sun
21634	Photosphere
21635	Layers of the sun; labeled diagram
21639	Red star
21640	Colored stars' temperatures; diagram
21644	Solar
21645	Earth and sun; relative sizes; diagram
21649	Solar eclipse
21650	Solar eclipse; diagram
21654	Solar flares
21655	Solar flare
21659	Solar prominences
21660	Solar prominences
21664	Sunspots
21665	Sun; sunspots
21669	Totality
21670	Total solar eclipse; corona and streamers
21674	Umbra
21675	Umbra; labeled diagram
21679	Yellow star
21680	Colored stars' temperatures; diagram

Reservoir

	CHAPTER 34
21684	RESERVOIR
21685	Solar prominence; artistic representation of Earth for scale
21686	Sun; prominences and corona ; color
21687	Sun; prominences and corona; black and white view of frame 21686
21688	Telescope filter to aid in viewing the sun
21689	Using a filter to view the sun safely
21690	Solar prominences; begin 9-frame sequence
21699	Solar observatory; begin 5-frame sequence
21704	Sunspot cycle; begin 2-frame sequence of diagrams
21706	Sun; full-disk view; sunspots; first frame has man-made spikes at top and bottom; begin 4-frame sequence
21710	Sun; sunspots close-up
21711	Total solar eclipse; diamond ring effect
21712	Observing the sun safely with binoculars; begin2-frame sequence
21714	Sunrise over a tropical ocean
21715	Quarter eclipsing the sun
21716	Ball
21717	Ball eclipsing the sun
21718	Radiation given off by the sun; gamma rays, X-rays, ultraviolet, visible, infrared, microwaves, radio waves; diagram
21719	Energy within the sun; labeled diagram
21720	Total solar eclipse with corona; labeled picture/diagram
21721	Moon revolving about the earth; tilt of moon's orbit; shadows of moon and Earth; missed solar eclipse; diagram

Starring... the sun

Name _____

Date _____

Multiple choice

Choose the most correct answer to complete the statement and circle the letter for it. Write the best answer on the blank line to complete the statement correctly.

1. The sun's apparent surface is the

_____

a) core.
b) photosphere.
c) energy source.
d) prominences.

2. The sun's core

_____

a) cannot be observed.
b) manufactures the sun's atmosphere.
c) provides the sun's corona.
d) is very hot, but can be observed with solar telescopes.

3. At the sun's core,

_____

a) explosions cause flares.
b) hydrogen is converted to helium, releasing energy.
c) explosions create prominences.
d) temperatures are cooler than at its surface.

4. $H + H \rightarrow He$ plus energy

_____

a) is how the sun makes its energy.
b) is how water is made chemically.
c) is called fission.
d) causes extra-large sunspots.

5. The dark areas on the sun's surface are

_____

a) hot spots.
b) hot convection currents.
c) sun spots.
d) flares.

Name _____

Date _____

Multiple choice

6. Sunspots are

_____

a) permanently defined areas on the sun's surface.
b) not permanent markings.
c) solar prominences.
d) warmer than surrounding areas.

7. Sunspots are dark areas on the

_____

a) core.
b) corona.
c) photosphere.
d) chromosphere.

8. Solar prominences form from material in the

_____

a) core.
b) chromosphere.
c) corona.
d) photosphere.

9. During a solar eclipse

_____

a) the umbra excludes sunlight from a certain area.
b) the entire Earth is in some part of the shadow.
c) the sun is blocked out for many hours.
d) the entire Earth is dark.

10. The period during which the sun is completely blocked by the moon is called

_____

a) umbra.
b) totality.
c) a partial eclipse.
d) penumbra.

Starring... the sun

Name _____

Date _____

Picture perfect
Choose the word from the Word Bank that best fits the videodisc image.

Word Bank:
observing the sun, fusion, a solar flare, corona, solar eclipse, around active sunspots, convection, 110 times Earth's diameter, sunspots, a total eclipse, a solar prominence, near a sunspot region, photosphere, chromosphere and corona

Frame #	
17518	1. What is Earth's size in relation to the sun? _____
18488	2. What is the astronomer doing? _____
19530	3. What are the three layers of the sun's atmosphere? _____
	_____
19534	4. What reaction is this formula showing? _____
19873	5. What type of currents are set up by the sun's core? _____
19883	6. What are you seeing in this sequence? _____
20132	7. Where do solar prominences occur? _____
20133	8. What did you see in this sequence? _____
20322	9. Where do solar flares usually occur? _____
20492	10. This is showing a _____.
20507—21586	11. This is showing a _____.
21586—21670	12. What area of the sun are you seeing? _____
21592	13. What are the dark areas on the sun? _____

A sunny crossword

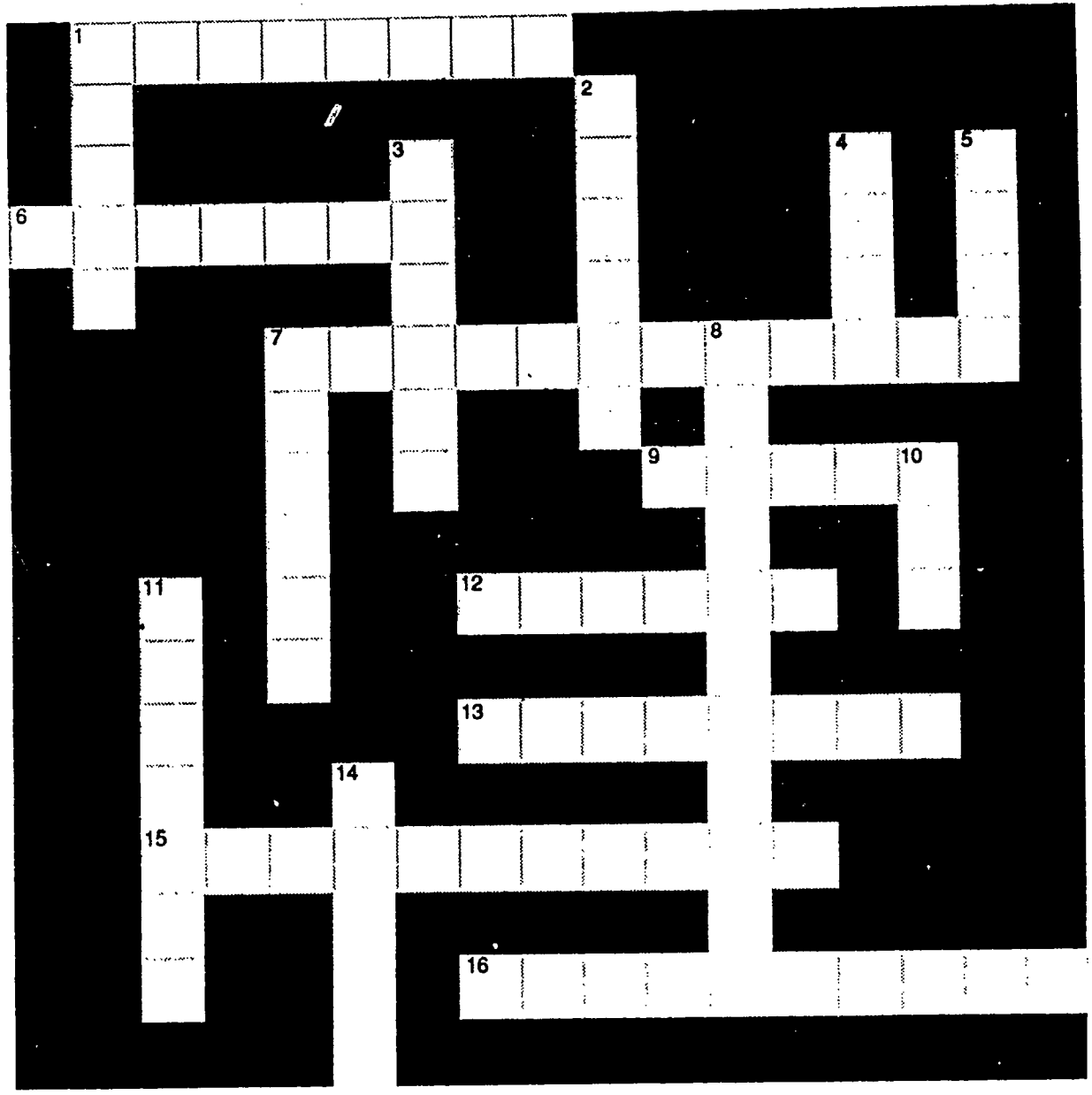
Name _____

Across clues

1. During a solar eclipse, the time when the sun is completely blocked by the moon
6. Type of solar eclipse in which only a part of the sun is blocked by the moon
7. Thin, hot layer of hydrogen gas surrounding a star
9. Having to do with the sun
12. Atomic reaction producing energy in the sun
13. Dark, cooler areas on the sun's surface
15. Cooler gases appearing to jump out from the sun's surface, but are actually falling down toward it from the corona
16. In the sun, heat is moved from one place to another by _____.

Down clues

1. Type of solar eclipse in which the entire sun is blocked by the moon
2. Color of an average temperature star
3. Sudden eruptions of great energy near sunspots
4. Center of the sun where most of the sun's energy is produced
5. Color of a star with the highest temperature
7. Hot, outermost atmosphere of the sun; its "crown"
8. Visible surface of a star
10. Color of a star with the coolest temperature
11. An event that occurs when the moon moves between the earth and sun, blocking the sun's light
14. Region of complete darkness during a total solar eclipse; the moon's shadow



Test answers

True or False

1. True
2. Scientists who study the sun are called solar astronomers.
3. The "surface" of the sun is called the photosphere.
4. Explosions around active sunspots are called solar flares.
5. True
6. True
7. True
8. Sunspots do interfere with radio and television transmissions.
9. Solar flares are surges of hot gas that reach far out into the corona.
10. A solar eclipse occurs when the moon lies between the earth and sun.

Multiple choice

1. b
2. a
3. b
4. a
5. c
6. b
7. c
8. c
9. a
10. b

Picture perfect

1. 110 times Earth's diameter
2. observing the sun
3. photosphere, chromosphere and corona
4. fusion
5. convection
6. a solar prominence
7. near a sunspot region
8. a solar flare
9. around active sunspots
10. solar eclipse
11. a total eclipse
12. corona
13. sunspots

A sunny crossword

Across clues

1. During a solar eclipse, the time when the sun is completely blocked by the moon
6. Type of solar eclipse in which only a part of the sun is blocked by the moon
7. Thin, hot layer of hydrogen gas surrounding a star
9. Having to do with the sun
12. Atomic reaction producing energy in the sun
13. Dark, cooler areas on the sun's surface
15. Cooler gases appearing to jump out from the sun's surface, but are actually falling down toward it from the corona
16. In the sun, heat is moved from one place to another by _____.

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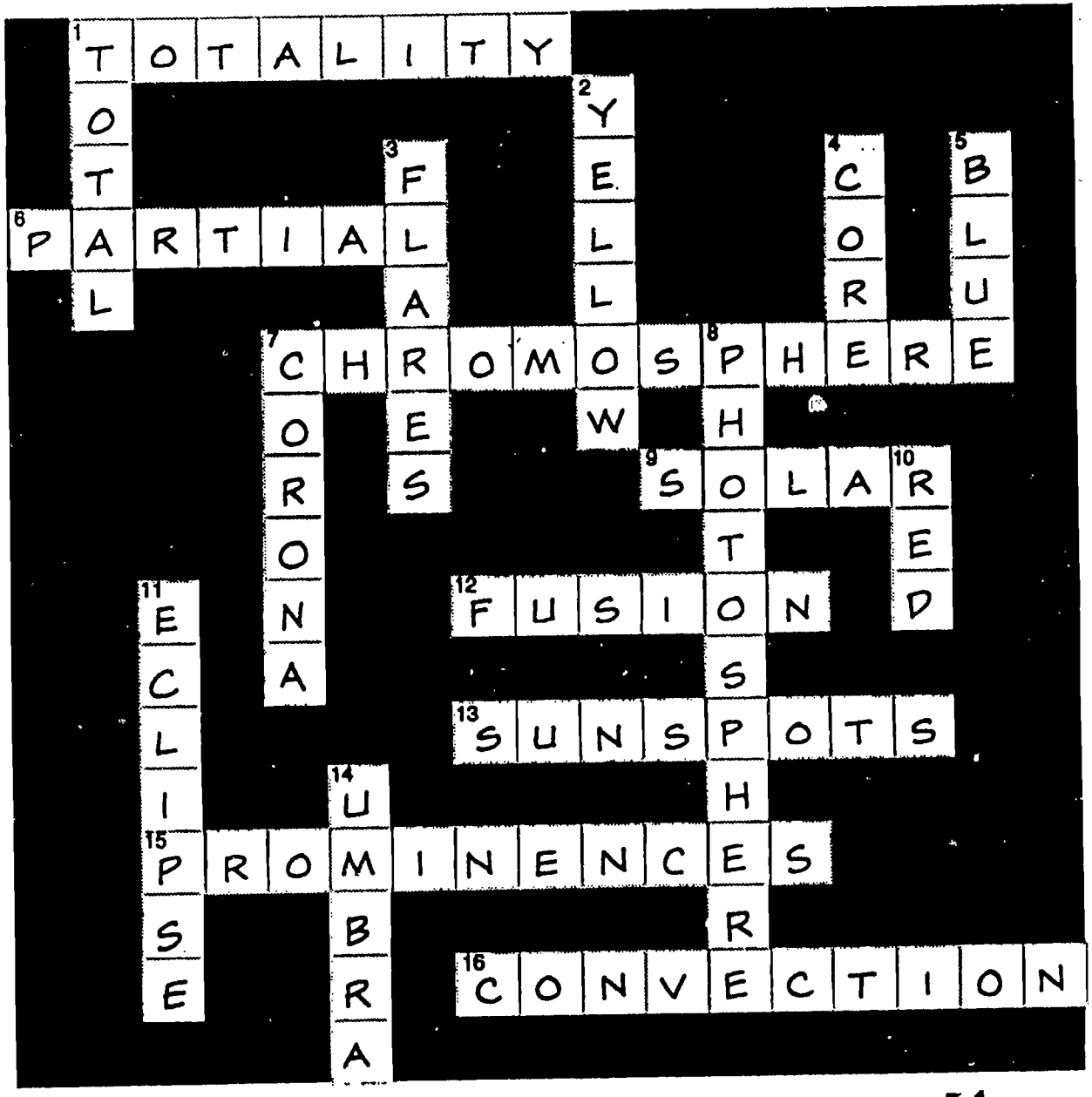
8. Visible surface of a star
10. Color of a star with the coolest temperature
11. An event that occurs when the moon moves between the earth and sun, blocking the sun's light
14. Region of complete darkness during a total solar eclipse; the moon's shadow



Starr . the sun - Answers Activity 2 - A sunny crossword puzzle

LASER DISC UNIT #3 - EARTH SCIENCE

Laser Disc Unit #3 - Earth Science

LASER DISC SOFTWARE - EARTH SCIENCE VOL. II - Chapters 35-46
Optical Data Corporation

General Content: Studying star light, galaxies, the sun
Laser disc, resources, lessons

1. A Journey through the solar system
   Chapter 36 - 21740 - 22083 All
   Chapter 37 - 22084 - 22430 All
   Chapter 38 - 22431 All
   Chapter 39 - 22554 - 22691 All

2. The inner solar system
   Chapter 40 - 22692 - 22869 (stop)

3. Illustrated Glossary
   Chapter 44 - 46156 - 46318 All

4. Laser Disc software is used with the following reading materials:

   Contemporary's Building Basic Skills in Science -
   Unit II: Earth Science Pages 74 - 80

   Contemporary's GED Science Exercise Book -
   Earth Science Pages 30 - 37

The following information is taken from the laser disc software package: KENNETH C. REILEY, ED., WINDOWS ON SCIENCE: EARTH SCIENCE VOL. II, OPTICAL DATA CORPORATION, WARREN, N.J., 1990. LESSON MANAGER: PP. 47,48, 49, 50.RESOURCES: PAGES ARE NOT NUMBERED.

Chapter 35 – Video Lesson
Chapter 44 – Illustrated Glossary
Chapter 45 – Reservoir

VOCABULARY

These words are used in context in the Video Lesson and appear in the Illustrated Glossary.

solar system
galaxy
Milky Way galaxy
comet
orbit
ellipse
Neptune
Pluto
planet
Uranus
Saturn
Jupiter
asteroid
crater
asteroid belt
Mars
comet head
comet tail
Earth
Venus
Mercury
solar wind
telescope
refracting telescope
lens, lenses
reflecting telescope
observatory
astronomer
radio telescope
satellite
Apollo Program
Skylab Program
Space Shuttle Program

CHAPTER 35

21727 UNIT MENU
21728 PLANETS AND SKYWATCHING

At home on Planet Lazarr

21729 AT HOME ON PLANET LAZARR
21730 Rho system; a fictitious planetary system; diagram
21731 Lazarrians; fictitious male and female humanoids; diagram
21732 "Milky Way" galaxy; arrow shows the location of our solar system

Formation of the solar system

21733 Formation of the solar system; gas and dust cloud; diagram
21734 Formation of the solar system; gas collapsing to form the sun; diagram
21735 Spinning ice skater
21736 Formation of the solar system; sun with orbiting dust and gases; diagram
21737 Formation of the solar system; sun with orbiting inner planets; diagram
21738 Formation of the solar system; sun with 9 orbiting planets; diagram
21739 Lazarrians near a window with night sky

A journey through the solar system

CHAPTER 36

21740 Movie with stereo sound: *"The Journey Begins"*; 11 seconds duration
22070 Comets; deep space iceballs; diagram
22071 Solar system; elliptical orbits of 5 outer planets; diagram

The outer solar system

Neptune

22072 Orbits of Pluto and Neptune; diagram
22073 Neptune and moon Triton; artist's conception
22074 Neptune; physical data; diagram

Pluto

22075 Pluto seen against star field in the background
22076 Pluto seen against star field in the background; later
22077 Pluto; split screen; showing detailed movement of this "wandering star"
22078 Pluto; physical data; diagram

Uranus

22079 Uranus with rings; Voyager spacecraft; artist's conception
22080 Uranus; physical data; diagram

Saturn

22081 Saturn; northern hemisphere; telescopic view from Earth
22082 Saturn; tilted; view of northern and southern hemisphere; Voyager image
22083 Saturn; close-up of atmosphere; enhanced color; Voyager image

CHAPTER 37

22084 Silent movie: *"Saturn Rotation"* ; Voyager images; 11 seconds duration
22425 Saturn; physical data; diagram
22426 Saturn; close-up of rings; Voyager image
22427 Saturn and composite picture of the moons; Voyager image

Jupiter

22428 Jupiter; telescopic view from Earth
22429 Jupiter; Voyager image
22430 Jupiter; close-up of atmosphere; Voyager image

CHAPTER 38

22431 Silent movie: *"Jupiter Approach"*; motion of the atmosphere; Voyager images; 4 seconds duration

CHAPTER 39

22554 Silent movie: *"Red Spot Rotation"*; Voyager images; 4 seconds duration
22690 Jupiter; physical data; diagram
22691 Jupiter and composite picture of four of its moons

The inner solar system

Asteroids

CHAPTER 40

22692 Silent movie: *"Asteroids"*; animated; 6 seconds duration

Mars

22840 Mars; telescopic view from Earth
22841 Mars; northern hemisphere; Viking Orbiter image
22842 Mars; close-up of the south pole; Viking Orbiter image
22843 Mars; Marinaris Valley; Viking Orbiter image
22844 Mars; Olympus Mons; Viking Orbiter image
22845 Mars; craters; Viking Orbiter image
22846 Mars; dry river beds; Viking Orbiter image
22847 Mars; hurricane feature and fog
22848 Mars; surface and pink sky; Viking Lander image
22849 Mars; scoop arm of soil sampler; Viking Lander image
22850 Mars; trenches made by the soil sampler; Viking Lander image
22851 Mars; physical data; diagram
22852 Comet; head and tail

Earth

22853 Earth from space; view from Apollo
22854 Earth; two hurricanes; view from a weather satellite
22855 Earth; physical data
22856 Space shuttle; view from a communications satellite launched by the shuttle

Venus

22857 Venus; view from Pioneer spacecraft
22858 Venus; closer view of clouds from Pioneer spacecraft
22859 Venus; physical data; diagram
22860 Venus; surface, soil and rock; view from a Russian Venera lander

Mercury

22861 Mercury; composite image from Mariner 10
22862 Orbit; planet, moon and sun; diagram
22863 Mercury; close-up of surface showing craters; Mariner 10 image
22864 Mercury; close-up of craters; Mariner 10 image
22865 Mercury; physical data
22866 Comet and spacecraft; computer graphic illustration

A closer view of Earth

22867 Earth; close-up of Cape Cod, MA; space shuttle view
22868 Kitt Peak; aerial view
22869 Kitt Peak; telescope domes at sunset

Optical telescopes and observatories

22870 Flower; close-up
22871 Moon; full phase over the ocean; naked-eye view
22872 Telescope dome; Palomar 200-inch telescope
22873 Telescope; general diagram
22874 Refracting telescope
22875 Moon viewed with small telescope
22876 Refracting telescope; labeled diagram
22877 Reflecting telescope; labeled diagram
22878 Reflecting telescope
22879 Kitt Peak Observatory; sunset view
22880 Kitt Peak; inside dome; 4-meter Mayall reflecting telescope
22881 Moon; close-up; viewed through large telescope
22882 Observatory; interior of dome; astronomer at the 1-meter reflecting telescope
22883 Andromeda galaxy; successive frames showing increasing exposure time: 1, 5, 30, 45 minutes; begin 4-frame sequence

Radio telescopes

22887 Radio telescope; 300-foot; National Radio Astronomy Observatory, Green Bank, West Virginia
22888 Astronomer viewing radio telescope images on a monitor; image-processing workstation
22889 Saturn; radio telescope view
22890 Saturn; optical telescope view
22891 Very Large Array; VLA; of the National Radio Astronomy Observatory; New Mexico; aerial view
22892 Radio telescopes of the VLA; close-up

Satellite views of Earth

22893 Landsat and Earth; diagram
22894 Landsat image; Texas; irrigation patterns
22895 Landsat image; San Joaquin Valley, CA; small airport
22896 Landsat image; Greenville, Mississippi; river and oxbow lake
22897 Landsat image; Meteor Crater on Earth; Arizona
22898 Meteor Crater viewed from observation platform
22899 Landsat image; Mt. St. Helens before eruption; snow-covered
22900 Landsat image; Mt. St. Helens after eruption; large ash-covered area
22901 Hurricane in the Gulf of Mexico; weather satellite view; begin 4-frame sequence
22905 Satellite communications; diagram
22906 Solar Max satellite
22907 Solar prominences viewed by Solar Max

Manned orbiting spacecraft

CHAPTER 41

22908 Narrated movie: *"Early American Manned Space Program"*; 2 minutes, 3 seconds duration

CHAPTER 42

26473 Narrated movie: *"Highlights from the Space Shuttle Program"*; 11 minutes duration

45216 Challenger mission 51L crew

45217 Space Telescope; artist's conception

CHAPTER 43

45218 Narrated movie: *"Future Space Station"*; 31 seconds duration

46149 Proposed Mars space colony; artist's conception

46150 Meteor; streak across the sky

46151 Activity: A model solar system

46152 Activity: A model solar system; materials

46153 Activity: A model solar system; answer

46154 THE END

46155 UNIT MENU

Illustrated Glossary

CHAPTER 44

46156 ILLUSTRATED GLOSSARY
Each vocabulary word is followed by an illustration, the definition, use in a sentence and the Spanish translation.

46157 Apollo Program (1966-1972)

46158 Moon landing; LM and lunar rover

46162 Asteroid

46163 Asteroids; diagram

46167 Asteroid belt

46168 Location of the asteroid belt; diagram

46173 Astronomer

46174 Astronomer looking through a telescope

46177 Comet

46178 Comet head and tail

46182 Comet head

46183 Comet head and tail

46187 Comet tail

46188 Comet head and tail

46192 Crater

46193 Mercury; close-up of craters

46197 Earth

46198 Earth viewed from space

46202 Ellipse

46203 Pluto - Neptune orbits; diagram

46207 Galaxy

46208 Spiral galaxy

46212 Jupiter

46213 Jupiter; Voyager image

46217 Lens

46218 Lens; labeled diagram

46222 Mars

46223 Sunlit hemisphere of Mars; Viking view

46227 Mercury

46228 Mercury; composite image from Mariner 10

46232 Milky Way galaxy

46233 Galaxy similar to the Milky Way; picture/diagram

46237 Neptune

46238 Neptune and Triton; Voyager spacecraft; artist's conception

46242 Observatory

46243 Observatory; telescope dome

46247 Orbit

46248 Planet - moon orbits; diagram

46252 Planet

46253 Planet - moon orbits; diagram

46257 Pluto

46258 Pluto; wandering star-like image; split-screen view

46262 Radio telescope

46263 Padio telescope; 300-foot dish at Green Bank, WV

46267 Reflecting telescope

46268 Reflecting telescope; labeled diagram

46272 Refracting telescope

46273 Refracting telescope; labeled diagram

46277 Satellite

46278 Planet - moon orbits; diagram

46282 Saturn

46283 Saturn; Voyager view

46287 Skylab Program (1973-1974)

46288 Skylab manned Earth-orbiting satellite

46292 Solar system

46293 Solar system; diagram

46297 Solar wind

46298 Comet and space probe; artist's illustration

46302 Space Shuttle Program

46303 Space Shuttle in space

46307 Telescope

46308 Refracting telescope; diagram

46312	Uranus
46313	Uranus and Voyager spacecraft; artist's illustration
46317	Venus
46318	Venus from Pioneer 10

ervoir

CHAPTER 45

46322	RESERVOIR
46323	Reflecting telescope and students
46324	Refracting telescope and student
46325	Kitt Peak National Observatory at sunset
46326	Voyager spacecraft at Kennedy Space Center
46327	Viking spacecraft on Earth; begin 2-frame sequence
46329	Kennedy Space Center Assembly Building
46330	Kennedy Space Center Assembly Building; Saturn V being moved to launch site
46331	Kennedy Space Center; Saturn V and liquid oxygen fuel
46332	Kennedy Space Center control center
46333	Saturn V launch; begin 2-frame sequence
46335	Earth from Apollo spacecraft; begin 3-frame sequence
46338	Lunar Module with astronaut
46339	Astronaut conducting experiment on the lunar surface
46340	Earthrise; view from Apollo command module; begin 16-frame sequence
46356	Half Earth from Apollo spacecraft
46357	Spacecraft re-entry into Earth's atmosphere
46358	Craters on lunar surface
46359	Lunar module and lunar rover
46360	Lunar rover
46361	Lunar flag-planting ceremony
46362	Command module orbiting the moon
46363	Astronaut and lunar rover
46364	Earth rise; begin 4-frame sequence
46368	Jupiter's ring; dots are part of the "camera" apparatus; jagged streaks are stars; rings are diagonal fuzzy band; time exposure
46369	Jupiter's ring; Voyager view from Jupiter's night side
46370	Saturn; rings and shadow of rings on the planet; moon
46371	Saturn; cloud bands in the atmosphere; color added
46372	Saturn; rings and shadow of rings on the planet
46373	Saturn; rings
46374	Saturn; rings; color added
46375	Saturn rings; close-up; color added
46376	Saturn's braided ring
46377	Voyager technician with laserdisc
46378	Laserdisc aboard Voyager; information on Earth's location
46379	Laserdisc aboard Voyager; information on humans
46380	Saturn rocket launch
46381	Voyager; artist's conception; begin 3-frame sequence
46384	Elliptical orbit of a planet about the sun; oblique view; diagram
46385	Orbit of a satellite; diagram
46386	Jupiter's rotation; diagram / picture

CHAPTER 46

46386	Silent movie: *"Jupiter's Rotation"*; note two moons as they orbit Jupiter; 13 seconds duration
46707	VOLUME II MENU

Acknowledgements
James Blinn
California Institute of Technology
Carnegie Institute of Washington
Celestron
Earth Resources Observation System, Landsat
Goddard Space Flight Center
Ralph Heigl
Jet Propulsion Laboratory
Johnson Space Flight Center
Lick Observatory
Mount Wilson Observatory
National Aeronautics and Space Administration
National Oceanic and Atmospheric Administration
National Optical Astronomy Observatory
National Radio Astronomy Observatory
Space and Planetary Image Facility
University of Arizona

A travel guide to the solar system

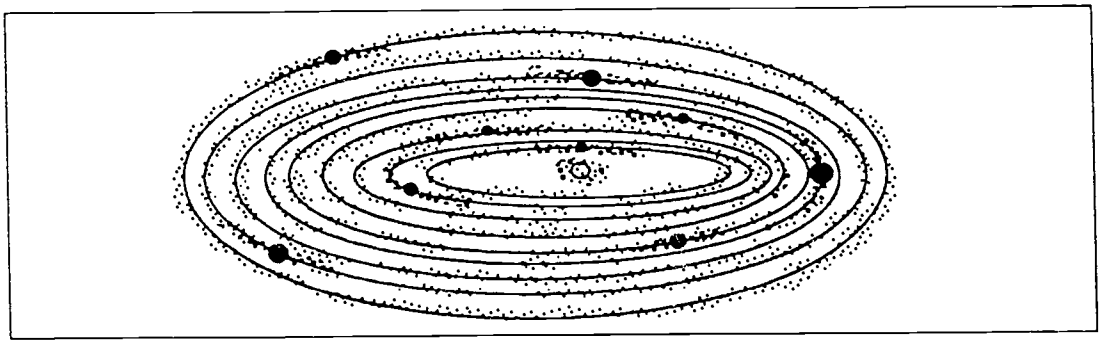
The solar system was formed more then 4.6 billion years ago. It all started when . . .

Frame 21733 A huge blob of hydrogen and helium gases and dust spun and swirled around. Eventually it collapsed, and started to spin even faster.

Most of the material (99.8%) went into forming the sun, the remaining 0.2% went into forming . . .

Frames 21737 to 21738 the nine planets (and their moons, asteroids and comets).

Frames 21736 to 21738



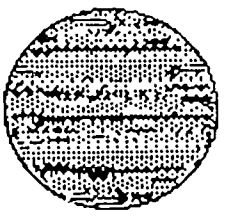
Physical data of the planets

Neptune

Frame 22074

distance from sun (in miles)	diameter (in miles)
2794 million	30,200
type of surface	gases
gaseous	methane
temperature (in degrees F)	ammonia
cloud tops: -328	hydrogen
core: 12,600	

Frame 22073



Pluto

Frame 22078

distance from sun (in miles)

3674 million

type of surface

solid

temperature (in degrees F)

surface: -450

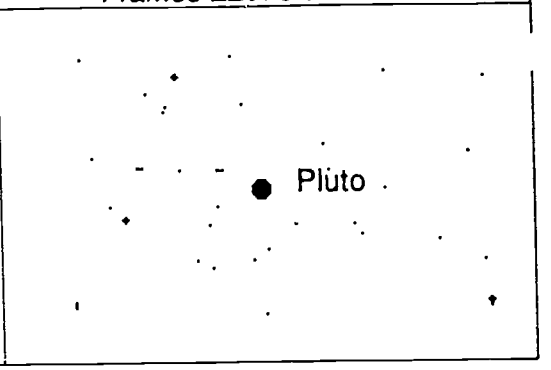
diameter (in miles)

1864

gases

methane (ice)

Frames 22075 to 22077



Uranus

Frame 22080

distance from sun (in miles)

1784 million

type of surface

gaseous

temperature (in degrees F)

upper layers: -355

core: 12,600

diameter (in miles)

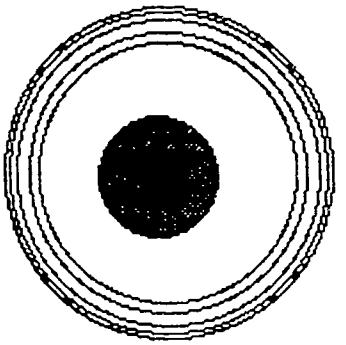
32,500

gases

methane

hydrogen

Frame 22079



Saturn

Frame 22425

distance from sun (in miles)

86[illegible] million

type of surface

gaseous

temperature (in degrees F)

cloud tops: -292

diameter (in miles)

74,500

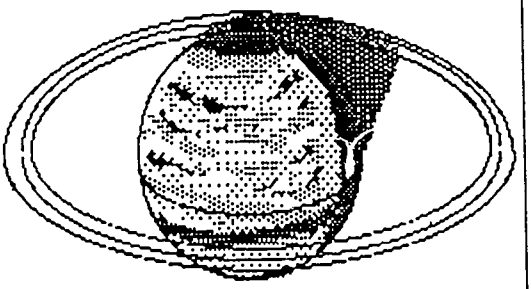
gases

hydrogen

helium

methane

Frames 22081 to 22424



Jupiter

Frame 22690

distance from sun (in miles)

484 million

type of surface

gaseous

temperature (in degrees F)

cloud tops: -202

core: 45,000

diameter (in miles)

89,000

gases

hydrogen

helium

methane

ammonia

Frames 22428 to 22689

Mars

Frame 22851

distance from sun (in miles)	diameter (in miles)
142 million	4222
type of surface	gases
solid	carbon dioxide
temperature (in degrees F)	carbon monoxide
Viking I: -190	oxygen
Viking II: 80	water

Frames 22840 to 22850

Earth

Frame 22855

distance from sun (in miles)	diameter (in miles)
93 million	7927
type of surface	gases
solid	nitrogen
temperature (in degrees F)	oxygen
average: 57	

Frames 22853 to 22854

Venus

Frame 22859

distance from sun (in miles)	diameter (in miles)
67 million	7520
type of surface	gases
solid	carbon dioxide
temperature (in degrees F)	water vapor
surface: 900	sulfur dioxide
above: -45	

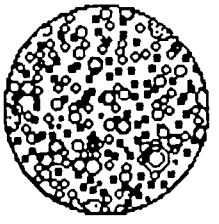
Frames 22857 to 22858

Mercury

Frame 22865

distance from sun (in miles)	diameter (in miles)
36 million	3030
type of surface	gases
solid	traces of helium,
temperature (in degrees F)	oxygen, argon,
maximum: 800	carbon dioxide,
minimum: -280	nitrogen, xenon

Frames 22861 to 22864



What am I?

Name _____

I have a long tail that always points away from the sun. My head is made of ice and rock, like a dirty iceball. My orbit around the sun is not round like a circle, but very stretched out. What am I?

_____

Astronauts visited and studied the moon during six voyages in my program. Some experiments that were done helped learn about moonquakes. Other experiments studied the surface and craters. Others studied the sun from the atmosphere–free moon. What am I?

_____

I'm the specific group of billions of stars to which the sun belongs. I have a spiral shape and lots of gas and dust in addition to stars. There's even a candy bar named after me! What am I?

_____

I'm a large planet made of methane and ammonia gases. At my cloud tops, I'm very cold — about 328 degrees below zero Fahrenheit. I'm greenish-blue. Until 1999 I am the most distant planet, but usually I'm the eighth planet from the sun. What am I?

_____

I'm any instrument that can be used to study objects in space. Some kinds like me can collect visible light with mirrors or with lenses. Other special kinds can collect invisible light called radio waves. I'm not the specific kind, but any instrument that collects light from space and lets someone "see" things in space better than without me. What am I?

_____

We are not nearly as big as the earth's moon, and only a few of us are round like a ball. Most of us are irregularly shaped rocks. But we all have large and small craters. We don't give off heat or light, but we reflect sunlight, depending upon how smooth or rough our surfaces are. We are not planets, yet most of us orbit the sun in a belt between Mars and Jupiter. What are we?

_____

Many astronomers work at my place. I'm where telescopes are kept. Objects in the sky are studied at me. The national one is called Kitt Peak. Another kind like me is in New Mexico where there are 27 radio telescopes. I can be a single building or a group of buildings. What am I?

_____

I'm often called the blue planet because water covers about three–fourths of my surface. I have a lot of wind and rain. My clouds are made of water. I have high mountains and plains, deserts and rain forests. Life abundantly lives on my surface, in my oceans and in my air. My air is mostly nitrogen and oxygen. What am I?

_____

I'm an instrument that astronomers use to study objects in space. I collect and bounce starlight with mirrors so my shape can be shorter than the kind with lenses. The biggest kind in the world are made like me. My mirror can be up to several feet wide. My eyepiece can be at the front or back of my tube. What am I?

_____

To look at me you'd think something knocked me over on my side! I'm a large, bluish–green planet with several dark rings. From Earth you can look straight at my north pole and my rings appear to circle me. My cloud tops are 355 degrees below zero Fahrenheit. What am I?

_____

I'm an area between the orbits of Mars and Jupiter where most of the asteroids are found. I'm not really an object, but a place. What's my name?

_____

I like to study the planets and stars to learn more about them. I work in an observatory and use telescopes to see the objects more clearly. I work mostly at night, but some of my friends can work any time of the day with other kinds of telescopes. Who am I?

_____

I'm the solid part of a comet. My surface is very cold. I'm made of ices and frozen gases. I'm only about 10 miles across, but from Earth you can see me because of the extra long tail streaming away from me. Even when I don't have a tail, I orbit the sun. So when I get close to it, I melt away a little each time I go around. What am I?

_____

I'm the current program of space missions begun in 1981. In my program, men and women are launched like a rocket, eventually reaching Earth orbit. There they conduct all sorts of experiments of the earth, the sun, space and special tests in weightlessness. The spacecraft lands like a glider. After being overhauled, the craft can be used again for another mission. What am I?

_____

I'm a small icy planet, usually the most distant from the sun. But for a few more years one planet is closer to the sun than I am. I have no atmosphere, but I do have a moon about half my size. What am I?

_____

I'm one of thousands of cuplike depressions on the moon, asteroids, some planets and many planets' moons. There are even 80 like me on the earth! I'm formed by meteorites hitting a solid surface. What am I?

_____

Planets orbit the sun in my shape. I'm not quite round. Sometimes I can be very elongated and slender. Another close word for me is oval. What am I?

_____

Billions of stars held together by gravity form me. I have some gas and dust, too. One example of me is The Milky Way. The sun is only one of billions of stars in my group. What am I?

_____

I have seasons like Earth does, but my ice is not like Earth's water ice — it's called "dry ice." My surface has lots of rusty dust that makes me look red. One of my mountains, called Olympus Mons, is an extinct volcano and bigger than any of Earth's mountains. Dry river channels cross some of my surface and my "air" is carbon dioxide. What am I?

_____

I'm made of a piece of glass, but I'm very special. I have been carefully ground so light going through me is bent just right. At least two like me are used in refracting telescopes to make objects look closer and larger. A simple kind of me is even used in a magnifying glass. What am I?

_____

I'm a large, golden-yellow planet, sixth from the sun. I am made of gases, mostly hydrogen, helium, and methane. My surface is gaseous, with bands of very pale yellow, white and brown. At least 23 icy moons circle me. But most spectacular is my ring system — thousands of tiny ringlets circle my equator. My ring particles are made of dirty ice chunks and dust. What am I?

_____

I'm sort of an imaginary object. Actually, I'm the path of an object around the sun, or a moon around a planet. I can even be the path of the Space Shuttle around the earth, or an Apollo spacecraft around the moon. (My name also can be a verb, not just a noun!) What am I?

_____

I'm one of nine larger bodies that orbit the sun. But I'm not a specific one. I orbit in an elliptical path. An example of me in the solar system is Venus. But there probably are others like me that orbit other central stars. What am I?

_____

I look like the earth's moon, but I orbit the sun. There are still many craters on my surface. No wind nor water has worn them away. I am very hot during the day and very cold at night because I have no atmosphere. What am I?

_____

Astronomers use me to study objects in space. I'm the special kind that bends and collects light with lenses. My shape is long and slender since light that comes in one end does not get bounced back and forth with any mirrors. I'm especially good for studying large areas of the sky. What am I?

_____

I'm an object that orbits another, larger object. I can be natural, like a moon, or I can be constructed like ones used for telephone communications. As long as I orbit something, I'm one of these. What am I?

_____

The earth and the sun were studied during my program which lasted from 1973 to 1974. Three teams of three men each worked and played in my roomy interior. What am I?

_____

A sun system is another name I'm sometimes called. I'm made of a group of objects like planets, comets and asteroids that orbit a central star. I'm the whole group of objects bound by the central star's pull of gravity. What am I?

_____

I'm the largest planet in the solar system and well known for my Great Red Spot, a hurricane near my equator. I'm made of swirling gases of hydrogen, helium, ammonia and methane. I'm so big that all the other eight planets, all asteroids and comets could fit inside me with room left over! What am I?

_____

I'm the very tiny particles that constantly stream out from the sun. I cause a comet's tail to be pointed away from the sun. All my particles push on the tail. (If it weren't for me, Mercury would have no atmosphere at all.) What am I?

_____

Astronomers use me to collect and study invisible light from space. I can collect radio waves. Most like me are round, dish–shape. There are 27 of my kind at a national observatory in New Mexico. What am I?

_____

You couldn't land on my surface without special spacesuits. Mechanical spacecraft from Russia have landed here, but my high temperatures and pressures destroyed them in less than an hour. My clouds are very thick and made of a strong acid. The "air" here is mostly carbon dioxide. You can land on me, but you wouldn't last long! What am I?

_____

I'm the long slender part of a comet. I always point away from the sun, and I'm made of tiny dust particles and gas. I form when frozen gases melt when the comet's head gets close enough to the sun. What am I?

_____

Planets and space exploration
Activity 2

Answers

1. A comet
2. The Apollo Program
3. The Milky Way
4. Neptune
5. A telescope
6. Asteroids
7. Observatory
8. Earth
9. Reflecting telescope
10. Uranus
11. Asteroid belt
12. An astronomer
13. Comet head
14. The Shuttle Program
15. Pluto
16. A crater
17. An ellipse
18. A galaxy
19. Mars
20. A lens
21. Saturn
22. An orbit
23. A planet
24. Mercury
25. Refracting telescope
26. Satellite
27. Skylab
28. Solar system
29. Jupiter
30. Solar wind
31. A radio telescope
32. Venus
33. A comet's tail

LASER DISC UNIT #4 - GEOGRAPHY

Laser Disc Unit #4 - Geography

LASER DISC SOFTWARE - EARTH SCIENCE VOL. II - CHAPTERS 10-16
Optical Data Corporation

General Content: Address: Earth: Physical geography and maps Laser disc, resources, lessons

1. East meets west
   Chapter 11 15309
   Chapter 12 15896 - 15921 All

2. Illustrated Glossary
   Chapter 15 16090 - 16222 All

3. Reservoir
   Chapter 16 (start) 16249 - 16334 (stop)

4. Laser Disc software is used with the following reading materials:

   Contemporary's Building Basic Skills in Social Studies - Unit II: Geography Pages 45 - 64

   Contemporary's GED Social Studies Exercise Book - Geography Pages 47 - 56

The following information is taken from the laser disc software package: KENNETH C. REILEY, ED., WINDOWS ON SCIENCE: EARTH SCIENCE VOL. II, OPTICAL DATA CORPORATION, WARREN. N.J., 1990. LESSON MANAGER: PP. 35, 36, 37. RESOURCES: PAGES ARE NOT NUMBERED.

VOCABULARY

These words are used in context in the Video Lesson and appear in the Illustrated Glossary.

sphere
ocean
globe
continent
axis
equator
hemisphere
latitude
parallels
longitude
meridians
prime meridian
map
projection
distortion
Mercator projection
Robinson projection
Goode's projection
Lambert/polar projection
compass rose
map margin
symbol
map key
scale
topographic map
elevation
contour lines

Address: Earth

Earth Science
Volume II

Chapters 10 – 16

CHAPTER 10

15306 UNIT MENU
15307 ADDRESS: EARTH: PHYSICAL GEOGRAPHY AND MAPS

East meets west

15308 Ocean scene; flat horizon and sea gull

CHAPTER 11

15309 Silent movie: *"Rotating Earth"*; 19 seconds duration
15894 Earth; Africa and the Red Sea; Apollo spacecraft view
15895 Swimmer in the ocean; sea gulls and horizon

CHAPTER 12

15896 Globe of Earth; begin 25-frame sequence; equatorial view; globe rotated 15 degrees eastward before the next frame; first and last frames show the Prime Meridian
15921 Globe; North Pole view; Arctic Ocean

CHAPTER 13

15922 Globe of Earth; begin 25-frame sequence; equatorial view; globe rotated 15 degrees eastward before the next frame; first and last frames show the Prime Meridian
15947 Globe; Antarctica labeled
15948 Earth; axis, North and South Poles labeled; direction of rotation; diagram
15949 Person standing on Earth facing the North Pole
15950 Person facing north; east, south and west directions labeled; diagram
15951 Person facing west; "?" for other directions; diagram
15952 Person facing east; "?" for other directions; diagram
15953 Person facing south; "?" for other directions; diagram
15954 Street map; school, candy store, home anad streets labeled; diagram
15955 Street map; school, candy store, home; compass directions; labeled diagram
15956 Earth; equator; unlabeled hemispheres
15957 Earth; equator, northern hemisphere labeled; "?" for southern hemisphere
15958 Earth; equator, northern and southern hemispheres labeled
15959 Activity: Which hemisphere?

CHAPTER 14

15960 Activity: Which hemisphere?; globe of Earth; begin 25-frame sequence; equatorial view; globe rotated 15 degrees eastward before the next frame; first and last frames show the Prime Meridian
15985 Globe; Antarctica labeled
15986 Globe; polar view, Arctic Ocean
15987 STEP FORWARD FOR ANSWER
15988 Activity: Which hemisphere?; answers

Latitude and longitude

15989 IMAGINARY LINES
15990 Earth; North and South Poles, equator, parallels of latitude; diagram
15991 Earth; North and South Poles, equator, parallels of latitude; in degrees; diagram
15992 Earth; North and South Poles, lines of longitude; diagram
15993 Earth; Prime Meridian; diagram
15994 Earth; North and South Poles, lines of longitude, Prime Meridian; in degrees; diagram
15995 Earth; western and eastern hemispheres; diagram
15996 U.S. map; latitude and longitude; Reno, Philadelphia and New Orleans
15997 Activity: Locating the treasure
15998 Activity: Locating the treasure; treasure map

Map projections

15999 MAP PROJECTIONS
16000 Map and globe
16001 Map; North Atlantic Ocean, North America and Europe
16002 Orange and knife
16003 Orange peeled in one piece
16004 Orange peel forced to be flat
16005 Using two hands to force an orange peel to be flat
16006 Goode's projection
16007 DISTORTION
16008 Mercator projection
16009 Robinson projection
16010 Goode's projection
16011 Lambert or polar projection

Map skills

16012 Map of U.S., Canada and Mexico
16013 Map of the northeastern U.S.

16014 Map of Rhode Island; parts of Connecticut, Massachusetts and New York
16015 Rhode Island road map
16016 Compass rose
16017 Road map with compass rose
16018 Map margin
16019 Map key
16020 Map key; close-up showing symbols; begin 4-frame sequence
16024 Road map; Newport to Jamestown; close-up showing symbols
16025 Road map; Newport to Jamestown; with scale
16026 Reading the scale and determining distance; begin 3-frame sequence
16029 Road map; close-up of Newport
16030 Sailboats off Newport
16031 Newport Jazz Festival
16032 Newport mansion
16033 Newport lighthouse
16034 Road map; Newport to Kingston; with compass rose
16035 Road map; Newport to Jamestown
16036 Road map; Jamestown; with Newport and Jamestown Bridges
16037 Road map; Jamestown Bridge; U.S. Route 1 intersection
16038 Road map; U.S. 1 to Kingston
16039 Road map; close-up of Kingston

Topographic maps

16040 TOPOGRAPHIC MAPS
16041 Topographic map; Kingston
16042 Road map,topographic map, camera and lunch
16043 Road map; Kingston to Great Swamp
16044 Map key; highway symbols
16045 State highway 138; 2 undivided, paved lanes
16046 Topographic map; Kingston to West Kingston
16047 Farmer tilling a field
16048 Topographic map; West Kingston to Kingston Station
16049 Train station at Kingston Station, RI
16050 Topographic Map; Kingston Station to intersection of South County Trail
16051 Farmer irrigating field; mountain in background
16052 Topographic map; intersection of route 138 and South County Trail; swamp and hills
16053 Small country road
16054 Topographic map; South County Trail and small country road, Great Swamp Fight Site stream, swamp and cemetery
16055 Sign; Great Swamp Fight Site
16056 Topographic map; Great Swamp Fight Site; South County Trail and small country road; stream, swamp and cemetery
16057 Marshy scene; trees and tall grass
16058 Country trail
16059 Ferns growing in a wet, shady environment
16060 Great Swamp Fight Site monument
16061 Topographic map; close-up Great Swamp Fight Site; swamp, country trail, monument
16062 Topographic map; Great Neck, swamp and railroad
16063 Contour lines relating to a relief map; simple hill; diagram
16064 Contour lines relating to a relief map; two mountains; diagram
16065 Topographic map; Great Neck; contour lines beginning at the swamp's edge
16066 Contour model of Great Neck
16067 Topographic map; Worden Pond; road, swamp, pond and houses
16068 Windsurfer on Worden Pond
16069 Topographic map; Intersection of U.S. Route 1 and Succotash Road, Snug Harbor
16070 Egrets in a salt marsh
16071 Topographic map; Snug Harbor to East Matunuck State Beach; salt marsh
16072 Salt marsh near East Matunuck State Beach
16073 Sign; East Matunuck State Beach
16074 Topographic map; East Matunuck State Beach; note the contour lines showing depth of the water in the ocean
16075 Path through sand dunes to the beach
16076 East Matunuck State Beach; sunbathers and ocean
16077 Topographic map; East Matunuck State Park to Galilee; breachway
16078 Boat basin
16079 Boat going through the breachway
16080 Restaurant near the boat basin
16081 U.S. highway map; placemat

Review

16082 REVIEW
16083 Globe; equator and Prime Meridian
16084 Earth; latitude and longitude lines; diagram
16085 Person facing north; directions labeled; diagram
16086 Road map; Newport to Jamestown
16087 Topographic map; Kingston to West Kingston
16088 THE END
16089 UNIT MENU

Illustrated Glossary

CHAPTER 15
16090 ILLUSTRATED GLOSSARY
Each vocabulary word is followed by an illustration, the definition, use in a sentence and the Spanish translation.

16091 Axis
16092 Earth's axis and direction of rotation; diagram

16096 Compass rose
16097 Compass rose on a map

16101 Continent
16102 Mercator projection map

16106 Contour lines
16107 Contour - elevation; two hills; diagram

16111 Distortion
16112 Goode's projection map

16116 Elevation
16117 Contour-elevation; simple hill; diagram

16121 Equator
16122 Earth; equator labeled; diagram

16126 Globe
16127 Globe of Earth

16131 Goode's projection
16132 Goode's projection map

16136 Hemisphere
16137 Eastern and western hemispheres; diagram

16141 Lambert or polar projection
16142 Lambert or polar projection map

16146 Latitude
16147 Parallels of latitude; labeled diagram

16151 Longitude
16152 Lines of longitude; labeled diagram

16156 Map
16157 U.S. highway map; placemat

16161 Map key
16162 Road map showing the map key

16166 Map margin
16167 Road map showing the map margin

16171 Mercator projection
16172 Mercator projection map

16176 Meridians
16177 Lines of longitude; labeled diagram

16181 Ocean
16182 Ocean scene with horizon and sea gull

16186 Parallels
16187 Parallels of latitude; labeled diagram

16191 Prime Meridian
16192 Earth; Prime Meridian labeled; diagram

16196 Projection
16197 Robinson projection map

16201 Robinson projection
16202 Robinson projection map

16206 Scale
16207 Road map showing the scale

16211 Sphere
16212 Orange

16216 Symbol
16217 Road map showing the map key

16221 Topographic map
16222 Topographic map; Great Neck, Rhode Island

Reservoir

CHAPTER 16
16226 RESERVOIR
16227 Contour model; close-up
16228 Contour model; Great Neck; top view
16229 Contour model; Great Neck; side view
16230 Railroad tracks
16231 Monument; southernmost point in the continental U.S.; Key West, Florida
16232 East Matunuck State Beach, breachway; Rhode Island; boat basin and beaches; aerial view
16233 Round Valley Reservoir, New Jersey; aerial view
16234 Road map of Rhode Island; scale
16235 Person facing north; different directions; un abeled diagram
16236 Earth; polar view with labeled lines of longitude; diagram
16237 Treasure map; lines of latitude and longitude
16238 U.S. highway map; placemat
16239 Earth; western hemisphere with labeled lines of latitude; diagram
16240 Mercator projection; lines of latitude and longitude; diagram
16241 Earth diagram; summer rays of the sun; diagram
16242 Earth diagram; direction of spin
16243 Earth diagram; tilt of the earth on its axis; precession of Earth's axis (26,000 year cycle)
16244 Construction of a topographic map of an island; begin 5-frame sequence
16249 Earth; northern and southern polar views; diagram
16250 Earth; eastern and western hemispheres; diagram
16251 Time zones of the western hemisphere; begin 2-frame sequence
16253 Earth; Antarctica
16254 Earth; Europe
16255 Earth; Asia
16256 Earth; Australia
16257 Earth; Africa
16258 Earth; South America
16259 Earth; North America
16260 U.S. map; population density and map key; begin 2-frame sequence
16262 U.S. map; vegetation zones and map key; begin 5-frame sequence
16267 U.S. map; temperature and map key; begin 4-frame sequence

Address: Earth

Name _____

Date _____

Picture perfect
Choose the word from the Word Bank that best fits the videodisc image.

Word Bank:
North Pole, Asia, compass rose, South America, equator, Europe, south, topographic map, Africa, Australia, prime meridian

Frame #		
15921	1. _____	view of the earth.
15922	2. _____	and _____ lines
15949	3. _____	is the direction at the boy's back
16016	4. _____	is on a map to show north
16050	5. _____	type of map is shown
16254	6. _____	continent is shown
16255	7. _____	continent is shown
16256	8. _____	continent is shown
16257	9. _____	continent is shown
16258	10. _____	continent is shown

Which hemisphere?

Name _____

Procedure

Observe Earth Science, Volume II, Frames 15960 - 15986.

Make an X to identify the hemisphere(s) in which Earth's oceans and continents are located.
Be carefull

	Northern Hemisphere	Southern Hemisphere
North America		
South America		
Europe		
Asia		
Africa		
Australia		
Antarctica		
Atlantic Ocean		
Pacific Ocean		
Indian Ocean		
Arctic Ocean		

The compass rose

Name _____

Following directions

In which direction do you travel to go from:

Point A to point B? _____

Point B to point C? _____

Point C to point D? _____

Point D to point E? _____

Point E to point F? _____

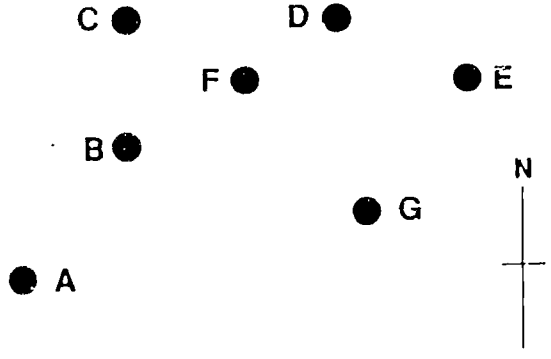
Point F to point G? _____

Point F to point C? _____

Point D to point F? _____

Point _____ is directly south of point _____.

Point _____ is directly west of point _____.



The compass rose

Now refer to the compass rose and this map of the United States to answer the following questions.

The city directly south of Seattle is _____.

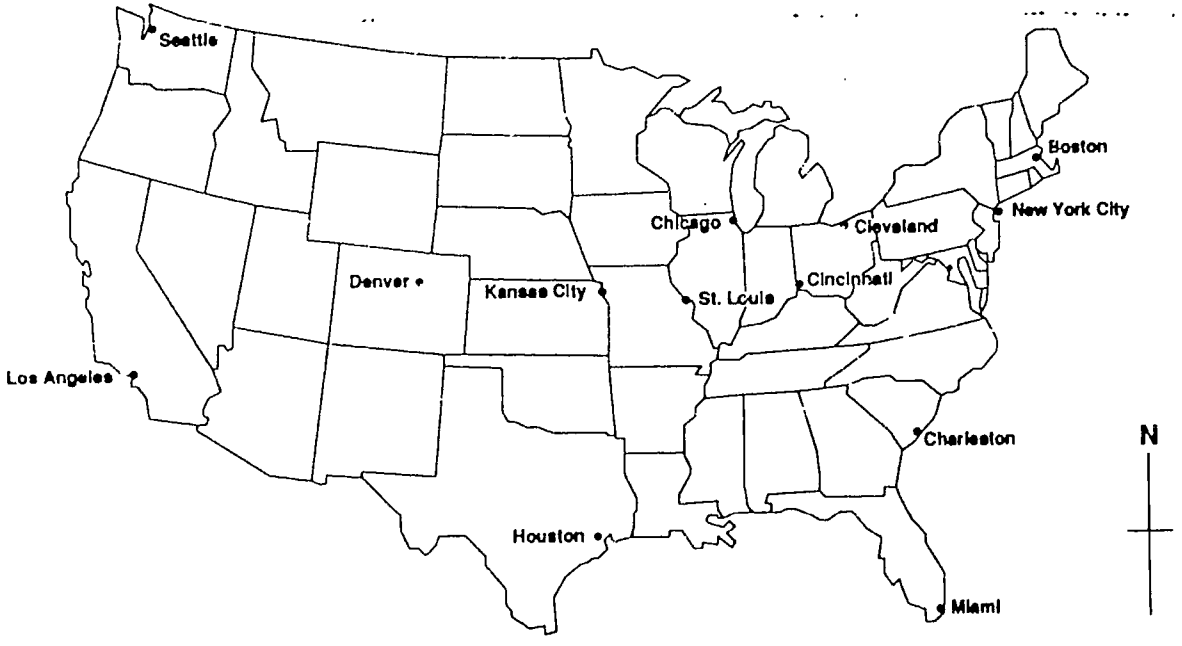
The city northeast of New York City is _____.

What two cities are directly west of St. Louis? _____ and _____.

If you were a pilot based in Kansas City, in what direction would you fly to get to:

Chicago _____ Miami _____ Houston _____ Cleveland _____.

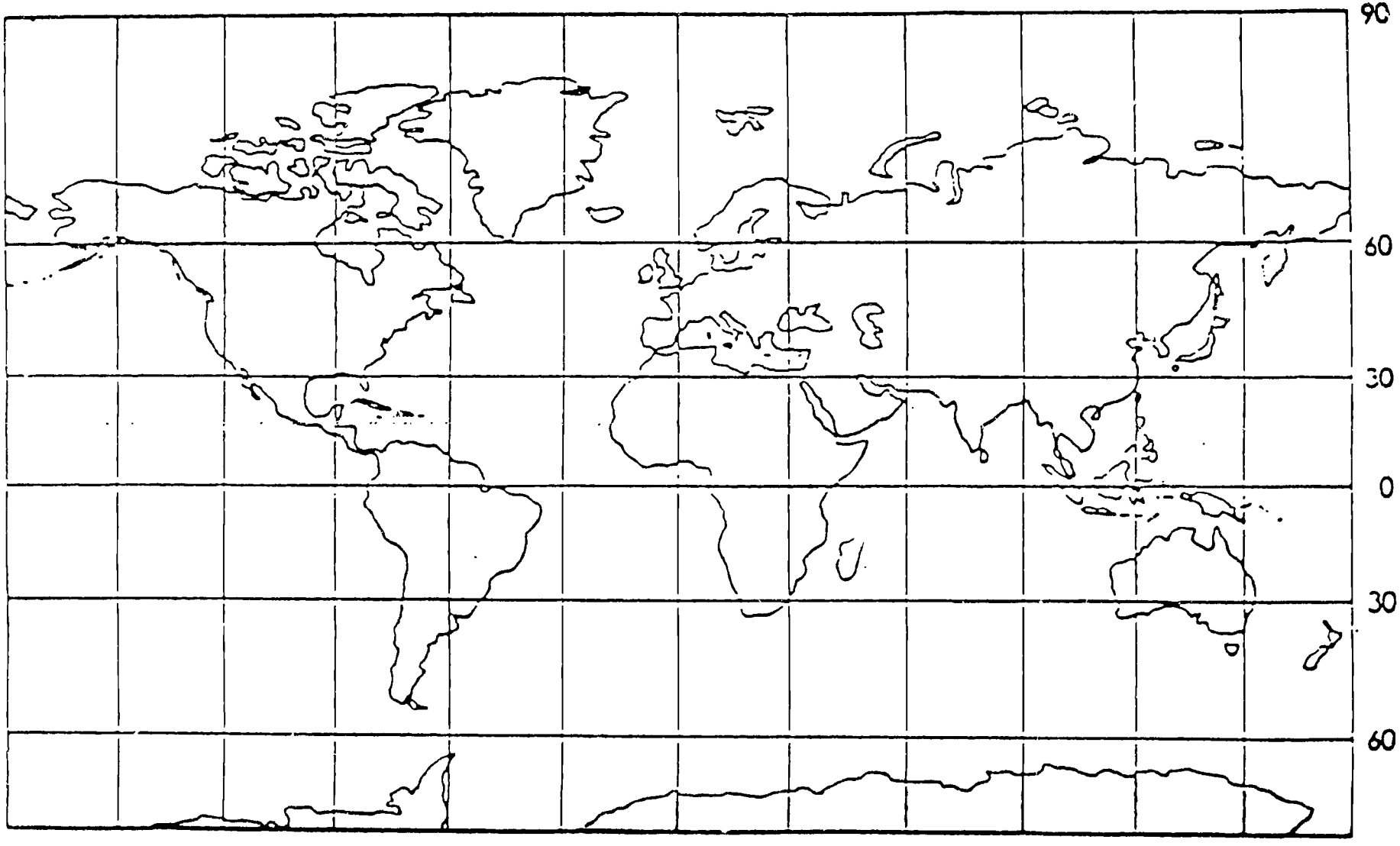
What cities are south of Charleston? _____.



16271	U.S. map; average rainfall and map key; begin 2-frame sequence
16273	U.S. map; vegetation and relief; begin 4-frame sequence
16277	Earth; Mexico
16278	Earth; Central America
16279	Earth; Canada
16280	Earth; U.S.
16281	U.S. map; topography; begin 9-frame sequence
	The next 45 frames show each state of the U.S. as it is found on a U.S. map and on a globe
16290	Alabama
16291	Alaska
16292	Arizona
16293	Arkansas
16294	California
16295	Colorado
16296	Connecticut
16297	Florida
16298	Georgia
16299	Hawaii
16300	Idaho
16301	Illinois
16302	Indiana
16303	Iowa
16304	Kansas
16305	Kentucky and Tennessee
16306	Louisiana
16307	Maine
16308	Maryland and Delaware
16309	Massachusetts and Rhode Island
16310	Michigan
16311	Minnesota
16312	Mississippi
16313	Missouri
16314	Montana
16315	Nebraska
16316	Nevada
16317	New Hampshire and Vermont
16318	New Jersey
16319	New Mexico
16320	New York
16321	North Carolina
16322	North Dakota
16323	Ohio
16324	Oklahoma
16325	Oregon
16326	Pennsylvania
16327	South Carolina
16328	South Dakota
16329	Utah
16330	Virginia
16331	Washington
16332	West Virginia
16333	Wisconsin
16334	Wyoming
16335	Globe of Earth; begin 25-frame sequence; northern hemisphere view; globe rotated 15 degrees eastward before the next frame; first and last frames show the Prime Meridian
16360	VOLUME II MENU

Acknowledgements

Aerial Data Reduction Associates, Inc.
Howard Bennett
Hammond Incorporated
Stuart Hammond
John Heigl
Houghton Mifflin Company
Dick Sanderson, cartographer
Keystone Aerial Survey
Jerry Krause
Rhode Island Department of Economic Development
Washington University


90
60
30
0
30
60

87

98

Test answers

True or False

1. The shape of the earth is like a ball.
2. About 75 percent of the earth is covered with water.
3. True
4. The prime meridian is 0 degrees longitude.
5. There is only one prime meridian on Earth.
6. The oceans that border North America are the Atlantic and Pacific oceans.
7. True
8. If you are facing north, the direction on your right is east.
9. True
10. North America is in the Northern Hemisphere.

Matching

1. e
2. j
3. g
4. c
5. d
6. a
7. i
8. h
9. f
10. b

Multiple choice

1. a
2. a
3. a
4. b
5. d

Picture perfect

1. North Pole
2. equator, prime meridian
3. south
4. compass rose
5. topographical map
6. Europe
7. Asia
8. Australia
9. Africa
10. South America

Which hemisphere?

Procedure

Observe Earth Science, Volume II, Frames 15960 - 15986.

Make an X to identify the hemisphere(s) in which Earth's oceans and continents are located.
Be carefull

	Northern Hemisphere	Southern Hemisphere
North America	X	
South America	X	X
Europe	X	
Asia	X	
Africa	X	X
Australia		X
Antarctica		X
Atlantic Ocean	X	X
Pacific Ocean	X	X
Indian Ocean		X
Arctic Ocean	X	

The compass rose

Following directions

In which direction do you travel to go from:

Point A to point B? NE

Point B to point C? N

Point C to point D? E

Point D to point E? SE

Point E to point F? W

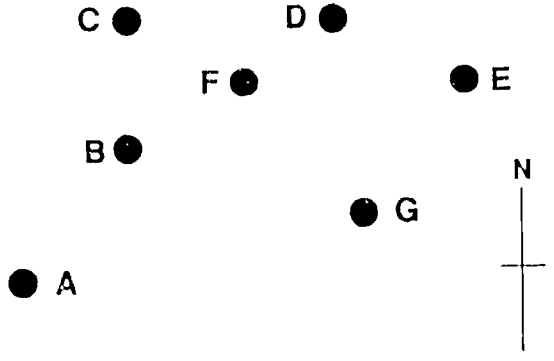
Point F to point G? SE

Point F to point C? NW

Point D to point F? SW

Point B is directly south of point C.

Point F is directly west of point E.



The compass rose

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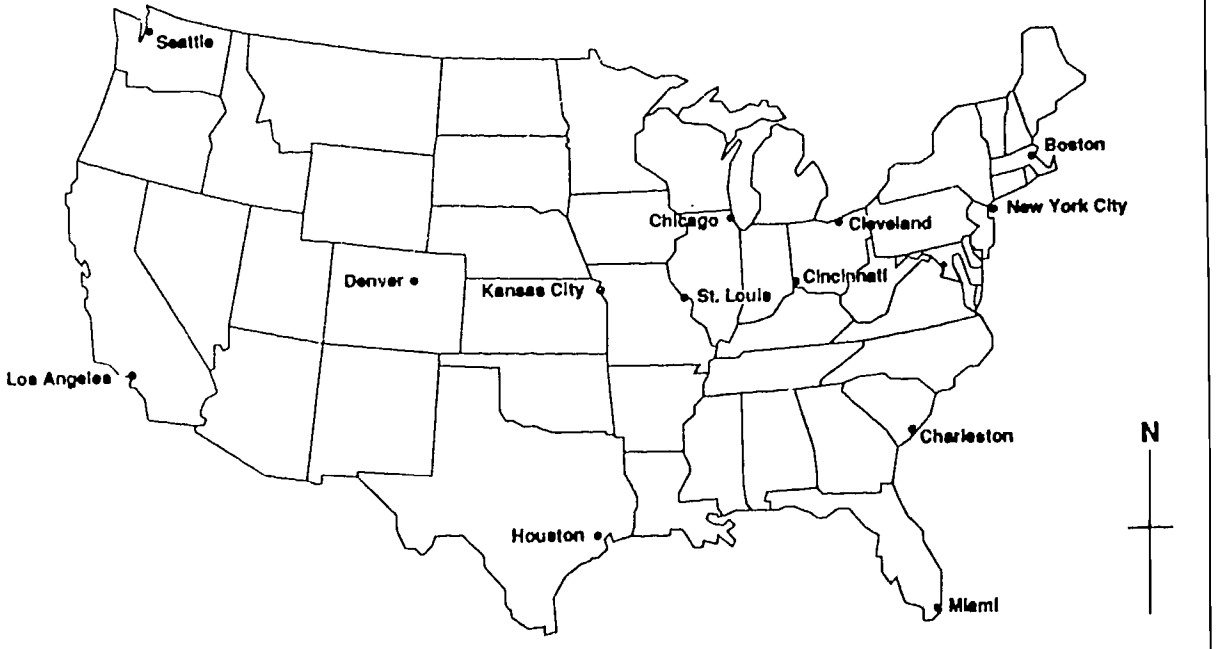
If you were a pilot based in Kansas City, in what direction would you fly to get to:

Chicago *NE* Miami *SE* Houston *S* Cleveland *NE*

What cities are south of Charleston? *Miami and Houston*



LASER DISC UNIT #5 - CHEMISTRY/PHYSICS

Laser Disc Unit #5 - Chemistry/Physics

LASER DISC SOFTWARE - PHYSICAL SCIENCE VOL. I - CHAPTERS 15 - 24
Optical Data Corporation

General Content: Physical and chemical changes
Laser disc, resource guide, teaching with windows, and lesson manager

1. States of matter
   Chapter 20 (start) 8278 - 8297 (stop)

2. Elements
   Chapter 21 8312 All

3. Periodic Table of Elements
   Chapter 22 9483 - 9997 All

4. Illustrated Glossary
   Chapter 23 1011 - 1015 All

5. Reservoir
   Chapter 24 (start) 10167 - 10175 (stop)

6. Laser Disc software is used with the following reading materials:

   Contemporary's Building Basic Skills in Science -
   Unit III: Chemistry Pages 84 - 103
   Unit IV: Physics Pages 106 - 123

   Contemporary's GED Science Exercise Book -
   Chemistry Pages 40 - 49
   Physics Pages 50 - 58

The following information is taken from the laser disc software package: MARGUERITE JARVIS AND KENNETH C. REILEY, EDS., WINDOWS ON SCIENCE: PHYSICAL SCIENCE VOL. I, OPTICAL DATA CORPORATION, WARREN, N.J., 1990. LESSON MANAGER: PP. 9, 10, 11, 12. RESOURCES: PAGES ARE NOT NUMBERED.

What's the matter?

Physical Science
Volume I

Chapter 15 – Video Lesson
Chapter 23 – Illustrated Glossary
Chapter 24 – Reservoir

UNIT OBJECTIVES

Upon completion of this unit, students will be able to:

Understand the concepts of mass and density
Identify properties common to all matter
Describe the motion of atoms and molecules in different states of matter
Identify the principle components of an atom and describe their relationship to one another
Use the Periodic Table of Elements to study elements

VOCABULARY

These words are used in context in the Video Lesson and appear in the Illustrated Glossary.

matter	liquid	proton	metal
mass	freezing point	neutron	atomic number
weight	boiling point	atomic mass	periodic table of elements
balance	gas	electron	group
volume	evaporation	electron cloud	non-metal
density	atom	model	
melting point	model	energy level	
solid	nucleus	element	

What's the matter?

Physical Science
Volume I

Chapters 15 – 24

CHAPTER 15

5914 UNIT MENU

What is matter?

5915 WHAT'S THE MATTER?
5916 Matter; classroom, students, desks, blackboard
5917 Matter; outside view of a school; flagpole

CHAPTER 16

5918 Matter in motion; movie with natural sound: *"F-15"*; 39 seconds duration
6854 Matter; Earth as seen from an Apollo spacecraft
6855 MASS
6856 Comparing masses; big and small dogs
6857 Comparing masses; small dog
6858 Comparing masses; big cat
6859 Measuring mass or weight; bathroom scale
6860 Measuring mass; cat and dog on balance; diagram
6861 Max Matter
7131 Max activity: Does Air Have Mass?; materials needed
7132 Max activity: WHAT SHOULD MAX DO?
7133 Max activity: blowing up a balloon
7134 Max activity: balancing the meterstick with two uninflated balloons

CHAPTER 17

7135 Max activity: movie with natural sound: *"Does Air Have Mass?"*; 6 seconds duration

Properties of matter

7315 PROPERTIES OF MATTER
7316 Properties; shape, color, texture, mass; a brick and a ball
7317 Property; COLOR; many ordinary items
7318 Property; COMPOSITION; many ordinary items
7319 Property; SHAPE; many ordinary items
7320 Property; SIZE; many ordinary items
7321 Property; ELASTICITY; many ordinary items
7322 Property; comparing mass; a straw and a paper clip on a double-pan balance
7323 Measuring volume; eraser showing length, width and height; diagram
7324 Measuring volume of an irregularly shaped object; volume of a push pin by displacement of water in a graduated cylinder
7325 DENSITY = MASS / VOLUME; formula
7326 Density; comparing densities to that of water; cork and rubber stopper in a beaker of water; cork floating, stopper sunk
7327 PROPERTIES OF MATTER; chart

States of matter

7328 STATES OF MATTER
7329 Solid; ice sculpture of a swan

CHAPTER 18

7330 Changing shape; movie with natural sound: *"Chipping an Ice Sculpture"*; 10 seconds duration
7590 SOLID; tightly packed molecules; labeled diagram

CHAPTER 19

7591 Changing states of matter; silent time-lapse movie: *"A Melting Ice Sculpture"*; 14 seconds duration

CHAPTER 20

8011 Liquid; silent movie: *"Dropping the Ice Pick"*; 8 seconds duration
8251 LIQUID; loosely packed molecules; labeled diagram
8252 Liquid; pouring swan water into a beaker
8253 Solid; frozen water; ice
8254 Change of state of matter; MELTING POINT; melting ice to form swan water again
8255 Change of state of matter; melting ice to form water; beaker above a burner
8256 Change of state of matter; BOILING POINT; boiling swan water
8257 GAS; more loosely packed molecules; labeled diagram
8258 Gas, liquid, solid; molecules in a flask; labeled diagram
8259 Change of state; evaporation; fish tank on first Monday
8260 Change of state; evaporation; fish tank on Wednesday
8261 Change of state; evaporation; fish tank on Friday

8262 Change of state; evaporation; fish tank on second Monday
8263 EVAPORATION; diagram

The atom

8264 AN ELEMENTARY LOOK AT MATTER
8265 Carbon; stick of carbon
8266 Carbon; cutting stick of carbon in half
8267 Carbon; cutting stick of carbon in half
8268 Carbon; cutting stick of carbon in half
8269 Carbon; cutting stick of carbon in half
8270 Carbon; cutting stick of carbon in half
8271 Carbon; cutting stick of carbon in half
8272 Carbon; cutting stick of carbon in half
8273 Carbon; cutting stick of carbon in half
8274 Carbon; cutting stick of carbon in half
8275 Carbon; smallest piece that can be cut with a knife
8276 Historical perspective; Greek philosopher Democritus holding a speck of carbon; an "atom;" *atomos*; illustration
8277 Carbon; smallest piece that can be cut with a knife
8278 Atomic model; three-dimensional model of an atom; labeled
8279 Atomic model; NUCLEUS; labeled diagram
8280 Atomic model; atom with two nuclear particles; labeled diagram
8281 Atomic model; atom with two nuclear particles; PROTON; labeled diagram
8282 Atomic model; atom with two nuclear particles; NEUTRON; labeled diagram
8283 Atomic model; atom with two nuclear particles; ATOMIC MASS; labeled diagram
8284 Atomic model; hydrogen; diagram
8285 Atomic model; carbon; labeled diagram
8286 Atomic model; gold; numbers of protons and neutrons; labeled diagram
8287 Elements; carbon and gold; numbers of neutrons and protons; chart
8288 Atomic model; ELECTRON; labeled diagram
8289 Atomic model; six electrons (carbon); diagram
8290 ELECTRON CLOUD MODEL; diagram
8291 Electron cloud model; possible position of an electron; labeled diagram
8292 Atomic model; ENERGY LEVELS; labeled diagram
8293 Atomic model; four energy levels; maximum number of electrons possible in each level; labeled diagram
8294 Atomic model; 12 electrons; (magnesium); diagram
8295 Atomic model; with symbols for numbers of protons and neutrons (magnesium); labeled diagram
8296 Atomic model; making a simplified model; with symbols for numbers of protons, neutrons and electrons (magnesium); diagram
8297 Elements; hydrogen, carbon and copper; chart
8298 STEP FORWARD FOR ANSWERS
8299 Atomic model; hydrogen simplified model; diagram
8300 Atomic model; carbon simplified model; diagram
8301 Atomic model; copper simplified model; diagram

Elements

8302 ELEMENT
8303 Elements; symbols for hydrogen, carbon and oxygen; H, C, O
8304 Ponder the question: What symbols do we use for helium and calcium?
8305 Elements; symbols for helium and calcium; He, Ca
8306 Ponder the question: What symbols do we use for iron and lead?
8307 Elements; symbols for iron and lead; Fe, Pb; ferrum and plumbum
8308 Elements; property; metal; ingots of silver and copper
8309 Elements; property; metal; sheets of silver and copper
8310 Elements; property; metal; malleability; a smith shaping metal
8311 Elements; property; metal; malleability and ductility; silver jewelry and copper wire

CHAPTER 21

8312 Elements; property; movie: narrated movie: *"Making Gold Coins"*; 40 seconds duration

Periodic Table of The Elements

9467 Elements; data boxes from Periodic Table arranged randomly; C, He, Be, H, B, Li; diagram
9468 Elements; data boxes from Periodic Table arranged alphabetically; C, He, Be, H, B, Li
9469 Elements; data boxes from Periodic Table arranged by atomic number; C, He, Be, H, B, Li
9470 Elements; the Periodic Table; unlabeled diagram
9471 Elements; PERIODIC TABLE OF ELEMENTS; labeled diagram
9472 Elements; ATOMIC NUMBER for hydrogen; data box from Periodic Table; labeled diagram
9473 Elements; ATOMIC MASS for hydrogen; data box from Periodic Table; labeled diagram
9474 Elements; helium data box from Periodic Table
9475 Elements; simplified model of helium; labeled diagram
9476 Periodic Table; man-made elements highlighted in green
9477 Elements; abundance in Earth's crust; chart
9478 Periodic Table; gaseous elements highlighted in green

9479 Elements; abundance in Earth's atmosphere; chart
9480 Elements; gas; helium balloons
9481 Elements; gas; neon lights
9482 Periodic table; liquid elements highlighted in green

CHAPTER 22

9483 Elements; mercury; liquid and metal; narrated movie: *"The Behavior of Mercury"*; 18 seconds duration
9983 Periodic table; solid elements highlighted in green
9984 Periodic table; metal elements highlighted in green
9985 Elements; metal; chromium; chrome bumper of a car
9986 Elements; metal; iron; horseshoe
9987 Elements; metal; copper; penny
9988 Elements; metal; lead sinker used in fishing
9989 Periodic table; non-metal elements highlighted in green
9990 Elements; non-metal; carbon; chunk of coal
9991 Elements; non-metal; sulfur
9992 Periodic table; group one metal elements highlighted in green
9993 Elements; group one metal; lithium floating
9994 Elements; group one metal; potassium
9995 Elements; data boxes from Periodic table; lithium, sodium and potassium
9996 Elements; group one metals; H, Li, Na, K, Rb, Cs, Fr; simplified model showing valence electron; chart
9997 Periodic table; groups numbered

Review

9998 REVIEW
9999 Matter; view of earth from space
10000 Mass; double-pan balance to measure mass
10001 Ponder the question: Can you identify the three states of matter; solid, liquid and gas?; unlabeled diagram
10002 Model of an atom; diagram
10003 Electron cloud model; diagram
10004 Simplified atomic model; nitrogen; diagram
10005 Element; data box from Periodic table; aluminum
10006 Element; data box from Periodic table; oxygen
10007 Periodic table; non-metal elements highlighted in green
10008 Ponder the question: symbols of elements F, Cl, Br, I, At; What do we have in common?
10009 END OF LESSON
10010 UNIT MENU

Illustrated Glossary

CHAPTER 23

10011 ILLUSTRATED GLOSSARY
Each vocabulary word is followed by an illustration, the definition, use in a sentence and the Spanish translation.

10012 Atom
10013 Atomic model

10017 Atomic mass
10018 Six data boxes from the Periodic Table

10022 Atomic number
10023 Hydrogen; data box from the Periodic Table

10027 Balance
10028 Double-pan balance

10032 Boiling point
10033 Water boiling above a flame; labeled

10037 Density
10038 Beakers of oil and water; oil floating on water in a graduated cylinder

10042 Electron
10043 Atomic model; labeled diagram

10047 Electron cloud model
10048 Electron cloud model; labeled diagram

10052 Element
10053 Strip of lead

10057 Energy level
10058 Atomic model; labeled diagram

10062 Evaporation
10063 Evaporation; labeled diagram

10067 Freezing point
10068 Thermometer on dry ice

10072 Gas
10073 Molecular diagram of a gas

10077 Group
10078 Periodic Table; groups numbered; diagram

10082 Liquid
10083 Molecular diagram of a liquid

10087 Mass
10088 Beaker of oil and standard masses on a double-pan balance

10092 Matter
10093 Brick and rubber ball

10097 Melting point
10098 Beaker of melting ice above a flame; labeled diagram

10102 Metal
10103 Strip of lead, bent to show malleability

10107 Model
10108 Ball and stick model of a molecule

10112 Neutron
10113 Atomic model; labeled diagram

10117 Non-metal
10118 Sulfur

10122 Nucleus
10123 Atomic model; labeled diagram

10127 Periodic Table of the Elements
10128 Periodic Table of the Elements; chart

10132 Pressure
10133 Girl blowing up a balloon

10137 Proton
10138 Atomic model; labeled diagram

10142 Solid
10143 Molecular diagram of a solid

10147 Volume
10148 Cubic meter; labeled diagram

10152 Weight
10153 Ordinary bathroom scale; close-up

Reservoir

CHAPTER 24
10157 RESERVOIR
10158 Model; atoms, elements and matter as collections of cubes; labeled diagram
10159 States of matter; molecular model of a solid; diagram
10160 States of matter; molecular model of a liquid; diagram
10161 States of matter; molecular model of a gas; diagram
10162 States of matter; molecular models of a solid, liquid and a gas; diagram
10163 States of matter; shape and volume; summary chart
10164 Change of state of matter; beaker of ice melting over a flame
10165 Change of state of matter; beaker of water boiling over a flame
10166 Properties; summary chart
10167 Periodic Table; element symbols
10168 Historical development; models of the atom; Thomson, Rutherford and Bohr; diagram and pictures
10169 Atomic model; particles, relative mass, charge and location; model and summary chart
10170 Atomic model; positively charged nucleus, negatively charged electron; strong force; diagram
10171 Atomic model; energy levels K-Q; labeled diagram
10172 Atomic model; energy levels; energy level drop and release of photon of light; labeled diagram
10173 Atomic model; energy levels; numbers of electrons possible at levels; labeled diagram
10174 Atomic models; simplified models showing outer electrons only
10175 Atomic models; isotopes of hydrogen
10176 Properties; metal; silver and copper; sheets and wire
10177 Properties; metal; silver and copper wires
10178 Properties; metal; smith shaping silver by hammering
10179 Properties; metal; silver, hand-made punch bowl
10180 Properties; metal; smith shaping metal
10181 Properties; metal; ingot of copper
10182 Properties; metal; blacksmith forming metal hooks by hammering heated metal
10183 Properties; metal; bracelets
10184 Properties; metal; elaborate copper necklace
10185 Properties; metal; three ingots of silver
10186 Properties; metal; ingot of copper
10187 Properties; metal; ductile; wire
10188 Properties; metal; malleable; lead strip
10189 Properties; metal; malleable; shiny if polished; copper strip
10190 Properties; metal; malleable; copper cooking pots
10191 Properties; metal; malleable; tin cans
10192 Properties; red powder cinnebar, liquid mercury in petri dishes; when heated, cinnebar produces mercury
10193 Properties; shape and composition; granular and cubic sugar
10194 Properties; shape and composition; trail mix
10195 Properties; shape and composition; sand and sea shells mixture
10196 Properties; many small ordinary items; unlabeled
10197 Properties; states of matter; temperature and thermometers; hot liquid soup, cold solid ice cream
10198 Properties; shape and composition; ball atop brick
10199 Properties; states of matter; solid and liquid; two eggs without shells in a glass bowl
10200 Properties; many items on a rack in a hardware store
10201 Composition of the Earth's atmosphere; percentage of argon, oxygen and nitrogen; cubic models; labeled diagram
10202 States of matter; gas and solid; materials needed for "Does Air Have Mass?" activity
10203 States of matter; gas and solid; balloons; inflated and uninflated
10204 States of matter; gas and solid; holding three helium-filled balloons
10205 States of matter; gas and solid; hot-air balloon festival
10206 States of matter; gas and solid; Goodyear blimp; 6-frame sequence

Periodic Table of

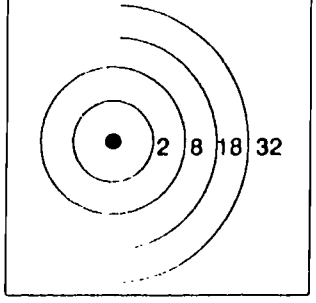
1 1 **H** Hydrogen																	2 4 **He** Helium
3 7 **Li** Lithium	4 9 **Be** Beryllium											5 11 **B** Boron	6 12 **C** Carbon	7 14 **N** Nitrogen	8 16 **O** Oxygen	9 19 **F** Fluorine	10 20 **Ne** Neon
11 23 **Na** Sodium	12 24 **Mg** Magnesium											13 27 **Al** Aluminum	14 28 **Si** Silicon	15 31 **P** Phosphorus	16 32 **S** Sulfur	17 35 **Cl** Chlorine	18 40 **Ar** Argon
19 39 **K** Potassium	20 40 **Ca** Calcium	21 45 **Sc** Scandium	22 48 **Ti** Titanium	23 51 **V** Vanadium	24 52 **Cr** Chromium	25 55 **Mn** Manganese	26 56 **Fe** Iron	27 59 **Co** Cobalt	28 59 **Ni** Nickel	29 64 **Cu** Copper	30 65 **Zn** Zinc	31 70 **Ga** Gallium	32 73 **Ge** Germanium	33 75 **As** Arsenic	34 79 **Se** Selenium	35 80 **Br** Bromine	36 84 **Kr** Krypton
37 85 **Rb** Rubidium	38 88 **Sr** Strontium	39 89 **Y** Yttrium	40 91 **Zr** Zirconium	41 96 **Nb** Niobium	42 96 **Mo** Molybdenum	43 98 **Tc** Technetium	44 101 **Ru** Ruthenium	45 103 **Rh** Rhodium	46 106 **Pd** Palladium	47 108 **Ag** Silver	48 112 **Cd** Cadmium	49 115 **In** Indium	50 119 **Sn** Tin	51 122 **Sb** Antimony	52 128 **Te** Tellurium	53 127 **I** Iodine	54 131 **Xe** Xenon
55 133 **Cs** Cesium	56 137 **Ba** Barium	57 139 **La** Lanthanum	72 178 **Hf** Hafnium	73 181 **Ta** Tantalum	74 184 **W** Tungsten	75 186 **Re** Rhenium	76 190 **Os** Osmium	77 192 **Ir** Iridium	78 195 **Pt** Platinum	79 197 **Au** Gold	80 201 **Hg** Mercury	81 204 **Tl** Thallium	82 207 **Pb** Lead	83 209 **Bi** Bismuth	84 209 **Po** Polonium	85 210 **At** Astatine	86 222 **Rn** Radon
87 223 **Fr** Francium	88 226 **Ra** Radium	89 227 **Ac** Actinium	104 257	105 260	106 263	107 262	108	109 266									

58 140 **Ce** Cerium	59 141 **Pr** Praseodymium	60 144 **Nd** Neodymium	61 145 **Pm** Promethium	62 150 **Sm** Samarium
90 232 **Th** Thorium	91 231 **Pa** Protactinium	92 238 **U** Uranium	93 244 **Np** Neptunium	94 244 **Pu** Plutonium

Periodic Table Key

3 7
Li
Lithium

Energy levels



the Elements

Color Key	
Red	Solid
Blue	Liquid
Gray	Gas

							2 4 **He** Helium
			5 11 **B** Boron	6 12 **C** Carbon	7 14 **N** Nitrogen	8 16 **O** Oxygen	9 19 **F** Fluorine	10 20 **Ne** Neon
			13 27 **Al** Aluminum	14 28 **Si** Silicon	15 31 **P** Phosphorus	16 32 **S** Sulfur	17 35 **Cl** Chlorine	18 40 **Ar** Argon
28 59 **Ni** Nickel	29 64 **Cu** Copper	30 65 **Zn** Zinc	31 70 **Ga** Gallium	32 73 **Ge** Germanium	33 75 **As** Arsenic	34 79 **Se** Selenium	35 80 **Br** Bromine	36 87 **Kr** Krypton
46 106 **Pd** Palladium	47 108 **Ag** Silver	48 112 **Cd** Cadmium	49 115 **In** Indium	50 119 **Sn** Tin	51 122 **Sb** Antimony	52 128 **Te** Tellurium	53 127 **I** Iodine	54 131 **Xe** Xenon
78 195 **Pt** Platinum	79 197 **Au** Gold	80 201 **Hg** Mercury	81 204 **Tl** Thallium	82 207 **Pb** Lead	83 209 **Bi** Bismuth	84 209 **Po** Polonium	85 210 **At** Astatine	86 222 **Rn** Radon

63 152 **Eu** Europium	64 157 **Gd** Gadolinium	65 159 **Tb** Terbium	66 163 **Dy** Dysprosium	67 165 **Ho** Holmium	68 167 **Er** Erbium	69 169 **Tm** Thulium	70 173 **Yb** Ytterbium	71 175 **Lu** Lutetium
95 243 **Am** Americium	96 247 **Cm** Curium	97 247 **Bk** Berkelium	98 251 **Cf** Californium	99 252 **Es** Einsteinium	100 257 **Fm** Fermium	101 258 **Md** Mendelevium	102 259 **No** Nobelium	103 260 **Lr** Lawrencium

What am I?

Name _____

An elementary look at matter

Answer the following questions using the Periodic Table of the Elements as a reference.

1. My nucleus contains 75 protons. What am I?

   _____

2. My atomic number is 28. What am I?

   _____

3. I am one of the man-made elements, named after a famous scientist whose first name was Albert. What am I?

   _____

4. We both have 10 neutrons in our nuclei. What are we?

   _____

5. I am a gas with two protons in my nucleus. What am I?

   _____

6. I am a metal and a liquid. What am I?

   _____

7. I have six protons and six neutrons. What am I?

   _____

8. I have three electrons. What am I?

   _____

9. I have three energy levels, with 10 electrons in my outer energy level. What am I?

   _____

10. I have one proton and no neutrons in my nucleus. What am I?

    _____

11. I have eight protons and eight neutrons, and am one of the gases you breathe. What am I?

    _____

12. I am a solid, non-metal with 53 electrons in my nucleus. What am I?

    _____

13. I am a man-made element, named after a country, and have 148 neutrons in my nucleus. What am I?

    _____

14. My symbol is Sn. What am I?

    _____

15. I am a metal with 79 electrons. I often am made into jewelry. What am I?

    _____

16. I am a non-metal liquid with 45 neutrons in my nucleus. What am I?

    _____

17. I am the non-metal element in table salt. What am I?

    _____

18. My Latin name is Ferrum. What am I?

    _____

19. I have 157 neutrons and am named after the scientist who created the first Periodic Table. What am I?

    _____

20. Between nickel and zinc
    is where I'll be.
    The pennies in your pocket
    are made out of me.
    What am I?

    _____

Classification of elements

Name _____

Purpose

This activity will help you become more familiar with the information on the Periodic Table of the Elements.

Procedure

1. Refer to your Periodic Table of the Elements and write down the symbol, atomic number and atomic mass for the elements listed in the table below.

2. Under the heading, *kind of element*, write down whether the element is a metal or non-metal.

Questions

1. What is so unusual about the placement of potassium and argon on the periodic table?

2. Explain why the elements' symbols are not always the first letters of their name.

3. In what way are the elements arranged on the Periodic Table of the Elements?

Element name	symbol	atomic number	atomic mass	kind of element
aluminum				
argon				
beryllium				
boron				
calcium				
carbon				
chlorine				
copper				
fluorine				
helium				
hydrogen				
iodine				
iron				
lead				
lithium				
magnesium				
mercury				
neon				
nitrogen				
oxygen				
phosphorus				
potassium				
silicon				
silver				
sodium				
sulfur				
zinc				

Name _____

Getting to know you...

In this activity, you will investigate the atomic structure of the elements. The data needed to complete this activity will be found on the Periodic Table of the Elements.

1. List the number of protons (p+) neutrons (n) and electrons (e-) which make up each of the following atoms:

ELEMENT	atomic mass	atomic number	protons	neutrons	electrons
hydrogen	_____	_____	_____p+	_____n	_____e-
helium	_____	_____	_____p+	_____n	_____e-
carbon	_____	_____	_____p+	_____n	_____e-
oxygen	_____	_____	_____p+	_____n	_____e-
sodium	_____	_____	_____p+	_____n	_____e-
chlorine	_____	_____	_____p+	_____n	_____e-
argon	_____	_____	_____p+	_____n	_____e-
sulfur	_____	_____	_____p+	_____n	_____e-

2. Fill in the number of electrons located in each energy level.

	1st energy level	2nd energy level	3rd energy level
hydrogen	_____	_____	_____
helium	_____	_____	_____
carbon	_____	_____	_____
oxygen	_____	_____	_____
sodium	_____	_____	_____
chlorine	_____	_____	_____
argon	_____	_____	_____
sulfur	_____	_____	_____

The shorthand method

In the boxes below, draw the atoms using the atomic model shorthand system.

H	He	C	O
Na	Cl	Ar	S

Questions

1. What is the relationship between the number of protons in an atom and that element's atomic number?

2. What is the relationship between the number of protons and the number of electrons in an atom?

3. What is the relationship between the number of protons and neutrons in an atom and that element's atomic mass?

What's the matter?

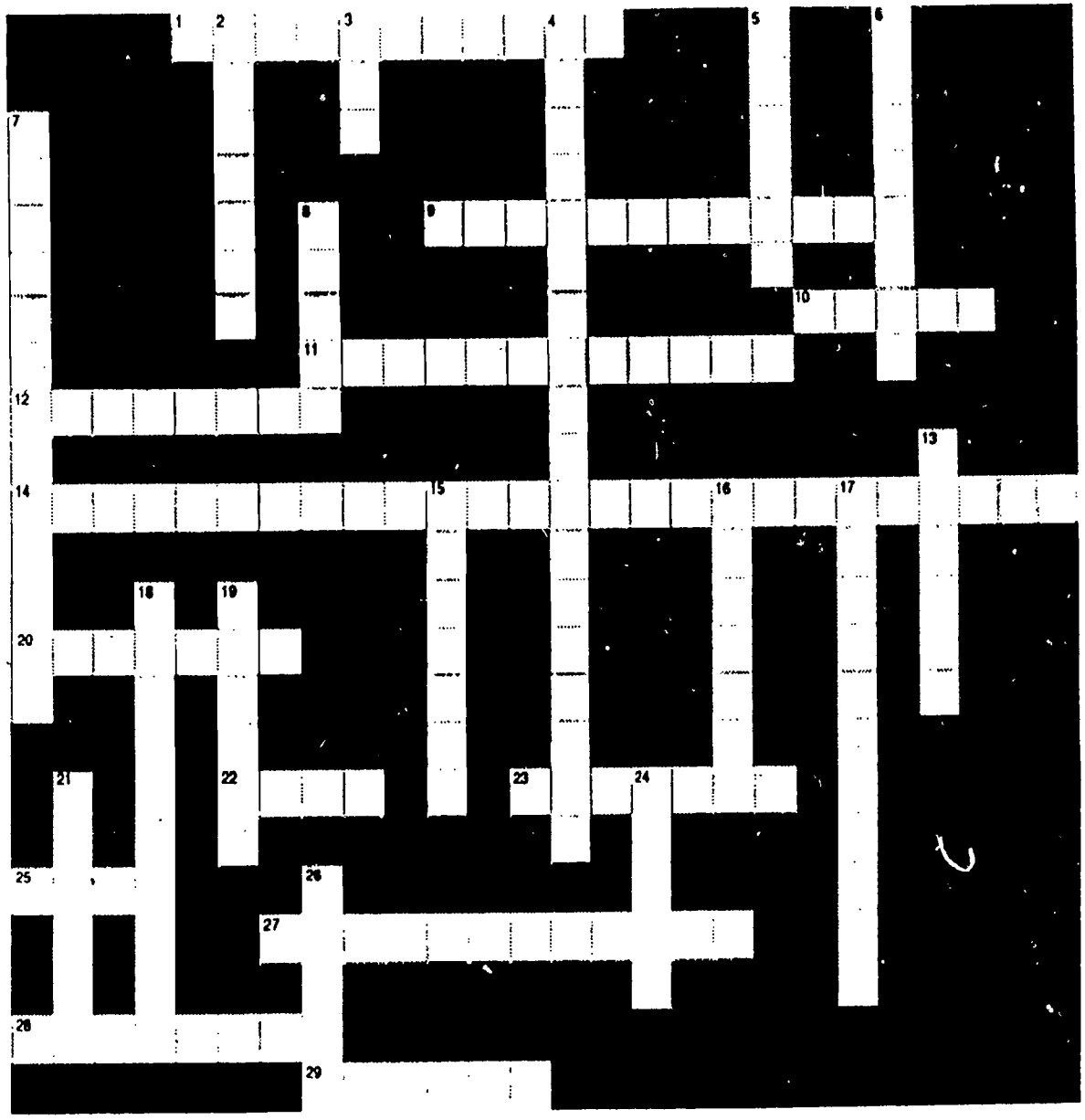
Name _____

Across clues

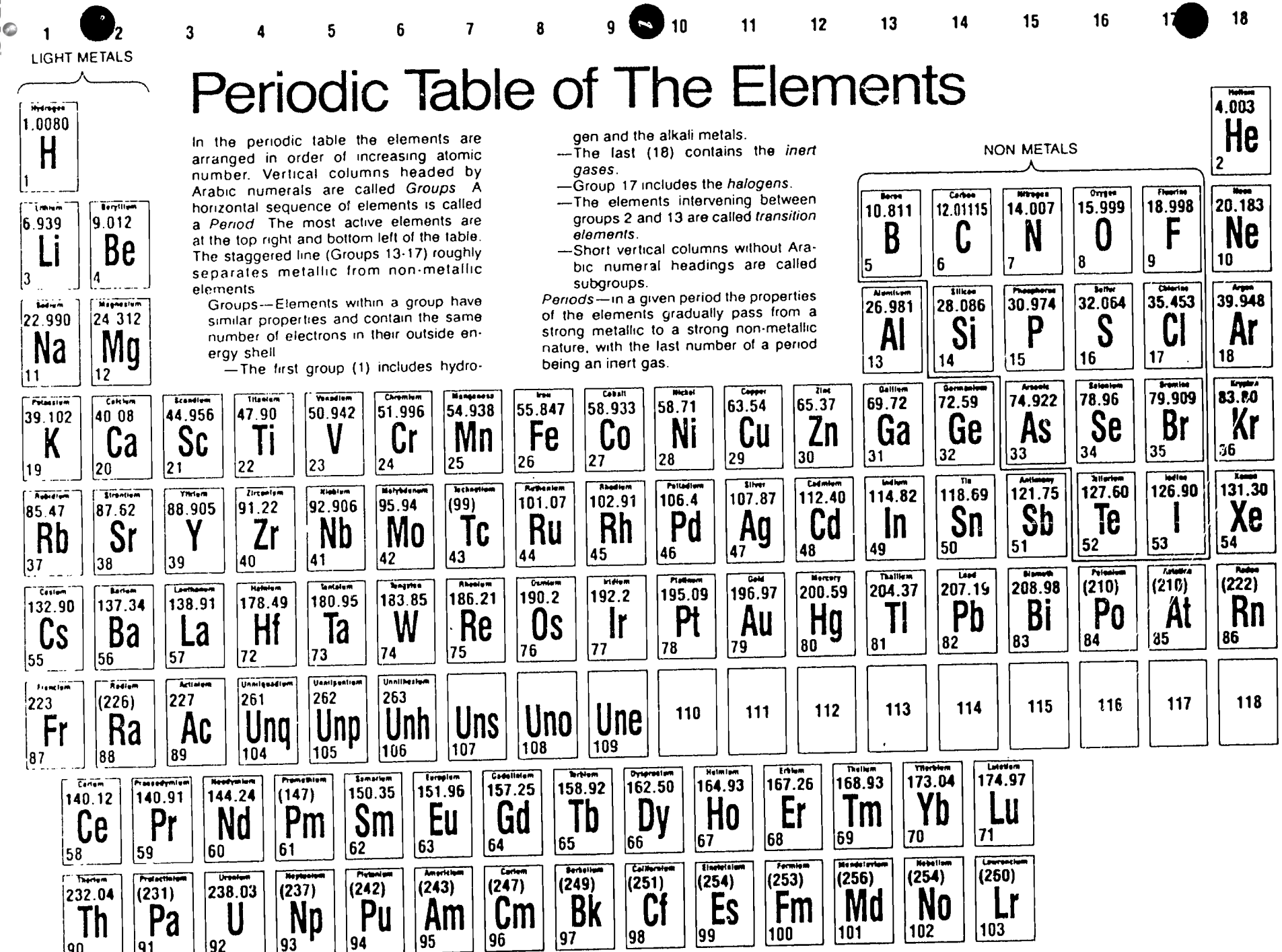
1. Electrons orbit the atom's nucleus in one of these.
9. Temperature at which a substance changes from a solid to a liquid
10. Fluorine, chlorine and bromine are in the same _____.
11. Number of protons in the nucleus
12. Carbon, sulfur, and iodine are _____ elements.
14 Arrangement of all the known elements in order of their atomic numbers
20. An atom of hydrogen does not have a _____ in its nucleus.
22. Amount of matter an object has
23. The brick sank to the bottom of the tank because its _____ is greater than that of water.
25. This smallest part of an element first was named by Democritus more than 2000 years ago.
27. Temperature at which a liquid changes into a gas
28 Force per unit area
29. A state of matter with a definite volume but no definite shape.

Down clues

2. The _____ of an atom of chlorine contains 17 protons and 18 neutrons.
3. An example of this is the air we breathe
4. The best way to represent an atom because the electrons are moving so quickly
5 A positively charged particle in the nucleus
6. A very small, fast-moving particle that orbits the nucleus of an atom
7. For water, it is at zero degrees celsius
8 Aluminum and gold are _____ elements.
13. An astronaut's _____ is less on the moon than on Earth.
15 The mass of a substance can be measured with this instrument.
16. Substance made of just one type of atom
17. Process by which fast-moving molecules escape from a liquid
18 Calculated by adding the number of protons and neutrons in the nucleus
19. Amount of space an object occupies
21. Anything that has mass and takes up space
24. State of matter with a definite shape and volume
26 A _____ of a water molecule can be made using gum drops and toothpicks.



Periodic Table of The Elements



In the periodic table the elements are arranged in order of increasing atomic number. Vertical columns headed by Arabic numerals are called *Groups*. A horizontal sequence of elements is called a *Period*. The most active elements are at the top right and bottom left of the table. The staggered line (Groups 13-17) roughly separates metallic from non-metallic elements.

Groups—Elements within a group have similar properties and contain the same number of electrons in their outside energy shell.

—The first group (1) includes hydrogen and the alkali metals.

—The last (18) contains the *inert gases*.

—Group 17 includes the *halogens*.

—The elements intervening between groups 2 and 13 are called *transition elements*.

—Short vertical columns without Arabic numeral headings are called subgroups.

Periods—In a given period the properties of the elements gradually pass from a strong metallic to a strong non-metallic nature, with the last number of a period being an inert gas.

Answers

1. Rhenium
2. Nickel
3 Einsteinium
4. Fluorine and Neon
5. Helium
6. Mercury
7. Carbon
8. Lithium
9. Calcium
10. Hydrogen
11. Oxygen
12. Iodine
13. Americium
14. Tin
15. Gold
16. Bromine
17. Chlorine
18. Iron
19. Mendelevium
20. Copper

Questions

1. What is so unusual about the placement of potassium and argon on the periodic table?

   Argon has a heavier atomic mass than potassium.

2. Explain why the elements' symbols are not always the first letters of their name.

   Several elements share the same first letter; several names are derived from Latin words

3. In what way are the elements arranged on the Periodic Table of the Elements?

   According to their atomic number

Element name	symbol	atomic number	atomic mass	kind of element
aluminum	Al	13	27	metal
argon	Ar	18	40	non-metal
beryllium	Be	4	9	metal
boron	B	5	11	non-metal
calcium	Ca	20	40	metal
carbon	C	6	12	non-metal
chlorine	Cl	17	35	non-metal
copper	Cu	29	64	metal
fluorine	F	9	19	non-metal
helium	He	2	4	non-metal
hydrogen	H	1	1	metal
iodine	I	53	127	non-metal
iron	Fe	26	56	metal
lead	Pb	82	207	metal
lithium	Li	3	7	metal
magnesium	Mg	12	24	metal
mercury	Hg	80	201	metal
neon	Ne	10	20	non-metal
nitrogen	N	7	14	non-metal
oxygen	O	8	16	non-metal
phosphorus	P	15	31	non-metal
potassium	K	19	39	metal
silicon	Si	14	28	non-metal
silver	Ag	47	108	metal
sodium	Na	11	23	metal
sulfur	S	16	32	non-metal
zinc	Zn	30	65	metal

Structure of atoms

Getting to know you...

1. List the number of protons (p+) neutrons (n) and electrons (e-) which make up each of the following atoms:

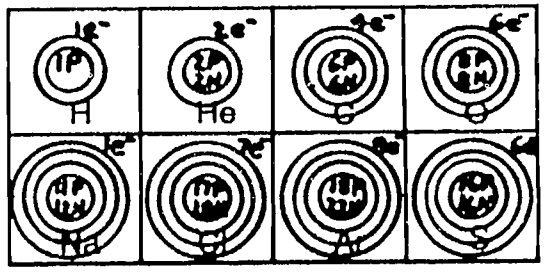
ELEMENT	atomic mass	atomic number	protons	neutrons	electrons
hydrogen	1	1	1 p+	0 n	1 e-
helium	4	2	2 p+	2 n	2 e-
carbon	12	6	6 p+	6 n	6 e-
oxygen	16	8	8 p+	8 n	8 e-
sodium	23	11	11 p+	12 n	11 e-
chlorine	35	7	17 p+	18 n	17 e-
argon	40	18	18 p+	22 n	18 e-
sulfur	32	16	16 p+	16 n	16 e-

2. Fill in the number of electrons located in each energy level.

	1st energy level	2nd energy level	3rd energy level
hydrogen	1	0	0
helium	2	0	0
carbon	2	4	0
oxygen	2	6	0
sodium	2	8	1
chlorine	2	8	7
argon	2	8	6
sulfur	2	8	8

The shorthand method

In the boxes below, draw the atoms using the atomic model shorthand system.



Questions

1. What is the relationship between the number of protons in an atom and that element's atomic number?

   The two are the same

2. What is the relationship between the number of protons and the number of electrons in an atom?

   They usually are the same

3. What is the relationship between the number of protons and neutrons in an atom and that element's atomic mass?

   The number of protons plus the number of neutrons equals the atomic mass.

What's the matter?

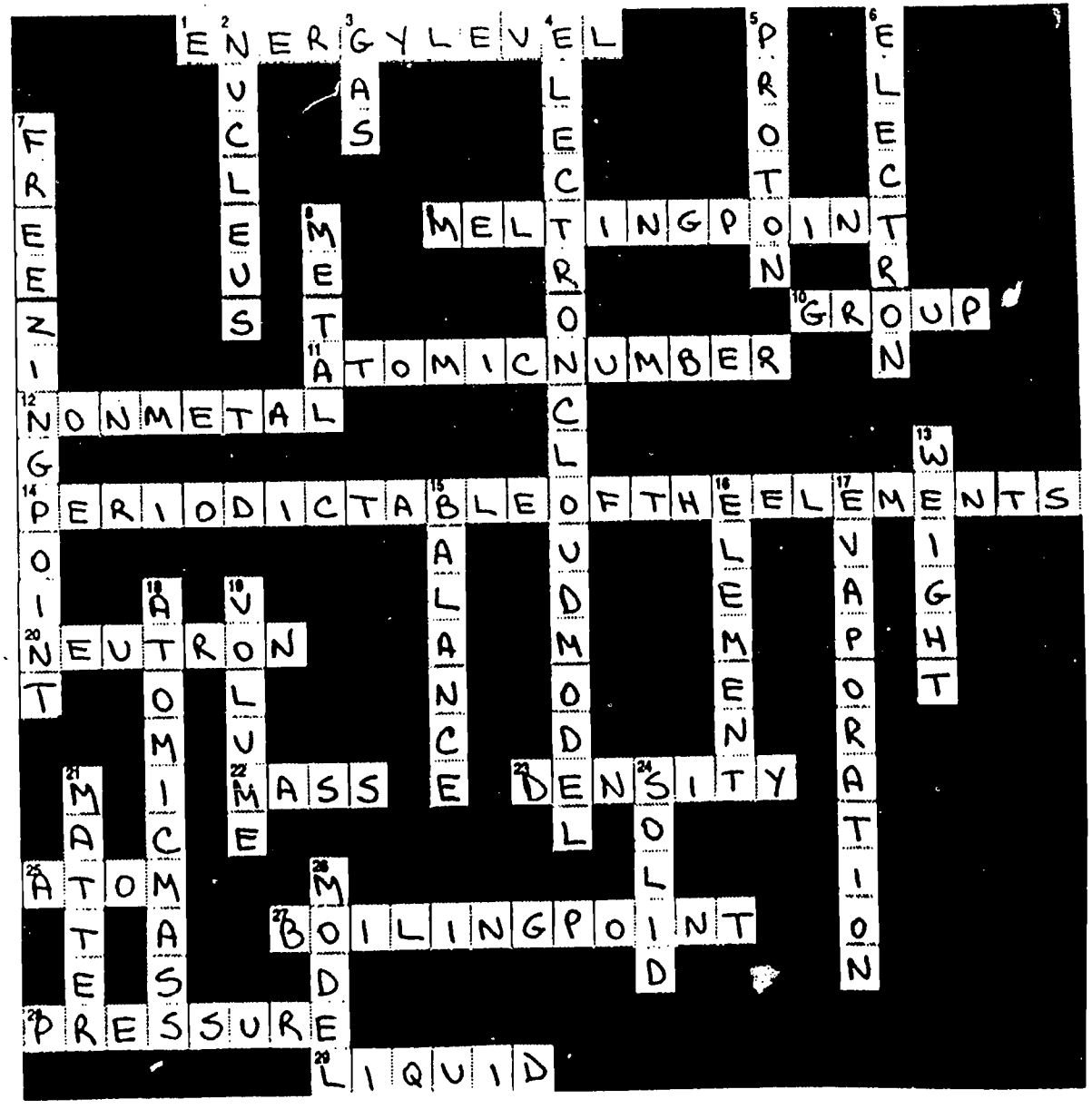
Name _____

Across clues

1 Electrons orbit the atom's nucleus in one of these.
9 Temperature at which a substance changes from a solid to a liquid
10 Fluorine, chlorine and bromine are in the same _____.
11 Number of protons in the nucleus
12 Carbon, sulfur, and iodine are _____ elements.
14 Arrangement of all the known elements in order of their atomic numbers
20. An atom of hydrogen does not have a _____ in its nucleus.
22. Amount of matter an object has
23 The brick sank to the bottom of the tank because its _____ is greater than that of water.
25. This smallest part of an element first was named by Democritus more than 2000 years ago.
27. Temperature at which a liquid changes into a gas
28 Force per unit area
29. A state of matter with a definite volume but no definite shape.

Down clues

2. The _____ of an atom of chlorine contains 17 protons and 18 neutrons.
3 An example of this is the air we breathe
4. The best way to represent an atom because the electrons are moving so quickly
5. A positively charged particle in the nucleus
6. A very small, fast-moving particle that orbits the nucleus of an atom
7. For water, it is at zero degrees celsius
8 Aluminum and gold are _____ elements.
13. An astronaut's _____ is less on the moon than on Earth.
15 The mass of a substance can be measured with this instrument.
16 Substance made of just one type of atom
17 Process by which fast-moving molecules escape from a liquid
18 Calculated by adding the number of protons and neutrons in the nucleus
19 Amount of space an oject occupies
21 Anything that has mass and takes up space
24 State of matter with a definite shape and volume
26 A _____ of a water molecule can be made using gum drops and toothpicks.



LASER DISC UNIT #6 - POLITICAL SCIENCE

Laser Disc Unit # 6 - Political Science

LASER DISC SOFTWARE - POWERS OF THE SUPREME COURT
POWERS OF THE CONGRESS
POWERS OF THE PRESIDENT
American Broadcasting Company

General Content: Information about the powers of the Supreme Court, the Congress, and the President
Each is a separate package of laser disc software. Each package contains one laser disc and a guidebook. The guidebook is designed for use with a bar code reader.

Powers of the Supreme Court

1. Glossary
   Chapter 39 53530 - 53915 Selected vocabulary

2. Resources
   Chapter 27: Historical Figures 51193 - 51265 All

3. Supplemental Material - Side One
   Chapter 3: Constitution and the Court
   Chapter 4: Preamble to the Constitution
   Chapter 5: U. S. Supreme Court
   Chapters 6 - 31: Amending the Constitution: Bill of Rights, Amendments 1 - 26, Additional Amendments

4. Supplemental Material - Side Two
   Chapter 9: Qualifications of becoming a Supreme Court Justice
   Chapter 13: Justice Swearing-in
   Chapter 20: Judicial Review: Marbury vs. Madison; Brown vs. Board of Education; Miranda vs. Arizona; United States vs. Nixon

Powers of the Congress

1. Glossary
   Chapter 65 51196 - 51604 Selected vocabulary

2. Resources
   Chapter 57 Development of Democracy 51917 - 51927
   Chapter 58 Profile of Congress 51930 - 51935
   Chapter 62 Committees of the House 52094 - 52120
   Chapter 63 Committees of the Senate 52123 - 52142
   Chapter 66 The Federal System 52223
   Chapter 67: Separation of Powers 52225
   Chapter 68: Checks and Balances: 52228 - 52229

3. Supplemental Material - Side One
   Chapter 8: Making Laws
   Chapter 10: Amending the Constitution

   How a Bill Becomes a Law
   Chapter 11: Enactment in the House and Senate
   Chapter 12: Method of Voting
   Chapter 13: Presidential Approval of Legislation
   Chapter 14: Presidential Veto
   Chapter 15: Overriding a Presidential Veto

   Separate Powers of the House and Senate
   Chapter 38: Powers of the House and Senate
   Chapter 39: Impeachment
   Chapter 40: Revenue Bills
   Chapter 41: Choosing a President
   Chapter 42: Trial of Impeachment
   Chapter 44: Choosing A Vice-President
   Chapter 45: Ratifying Treaties

4. Supplemental Materials - Side Two
   Types of Government
   Chapter 4: Anarchy
   Chapter 5: Totalitarianism
   Chapter 6: Monarchy
   Chapter 7: Democracy
   Chapter 8: Comparing Governments

Chapter 9: Communism
Chapter 10: Capitalism

Organization of Congress
Chapter 24: Congress Convenes
Chapter 26: Speaker of the House
Chapter 27: Vice-President (President of the Senate)
Chapter 28: Congressional Committees

Rights and Responsibilities of Citizenship
Chapter 48: Citizenship
Chapter 49: Becoming a Citizen
Chapter 50: Right to Vote

Powers of the President

1. Glossary
   Chapter 47 52650 - 52905 Selected vocabulary

2. Resources
   Chapter 30: Amendments to the Constitution 51695 - 51732
   Chapter 32: Documents 51816 - 51897
   Chapter 33: Presidents of the United States 51901 - 51899
   Chapter 36: Executive Departments 52043 - 52060
   Chapter 37: Directory of States 52065 - 52063 (includes Territories and Possessions)

3. Supplemental Materials - Side One
   Chapter 3: Constitution and the President
   Chapter 14: The Electoral College

4. Supplemental Materials - Side Two
   Chapter 6: Roles of the President
   Chapter 14: Checks and Balance
   Chapter 19: War Powers Act

Laser Disc software is used with the following reading materials:

Contemporary's Building Basic Skills in Social Studies -
Unit III: Political Science Pages 68 - 90

Contemporary's GED Social Studies Exercise Book -
Political Science Pages 15 - 25

The following information is taken from the laser disc software packages:

POWERS OF THE SUPREME COURT: ABC NEWS INTERACTIVE, AMERICAN BROADCASTING COMPANIES, INCORPORATED, 1991, PP. 4, 56, 89, 90.

POWERS OF THE CONGRESS: ABC NEWS INTERACTIVE, AMERICAN BROADCASTING COMPANIES, INCORPORATED, 1991, PP. 51, 71, 72, 139, 140.

POWERS OF THE PRESIDENT: ABC NEWS INTERACTIVE, AMERICAN BROADCASTING COMPANIES, INCORPORATED, 1991, PP. 55, 56, 65, 104.

Powers of the Supreme Court

Chapter Guide
Side One

Chapter 3: Constitution and the Court

(1:34)

In this chaoter of the videodisc, Chief Justice William Rehnquist discusses the separation of powers and provides examples of how the three branches of government check and balance each other. Images of the Supreme Court, Congress and the presidency are shown.

Full Chapter

Video Segment Only
Frames 2562-5389

Relatec visual Frames

Graphics:
2558 Article VI Clause 2
2559 Article III Section 1
2561 Article III Section 2
Clause 1

Fact file:
5390 The Supreme Cour
and the Constitution

Focus question: *
5391

Glossary terms:
53586 Checks and balances
53587 Chief justice
53613 Congress
53732 Judicial Review
53733 Judiciary branch
53742 Law
53857 Separation of powers
53898 Unconstitutional

Questions for Discussion

What is the purpose of separation of powers among the three branches of government?
Why are checks and balances so vital to the functioning of our democracy?
How do the three branches of government check and balance each other?
How does the judicial branch check and balance the executive and legislative branches? Give examples.
How do the executive and legislative branches check and balance the judicial branch? Give examples.
What are the advantages and disadvantages of a system of checks and balances?

Transcript:

Student: Mr Chief Justice why did the framers of the U S Constitution set the Supreme Court apart from the legislative and executive branches?

Chief Justice William Rehnquist: Well I think because they believed very strongly in the separation of powers That is that there are basically three different kinds of power exercised by a government The executive power which in our country is represented by the President the legislative power which in our country is represented by Congress and the judicial power which in our country is represented at least in the federal system by the federal courts And they thought it was very important in order to prevent government as a whole from becoming too all powerful that these three powers be separated so that they might on occasion check and balance one another

Student: Exactly how do they check and balance one another?

Chief Justice William Rehnquist: Well if you look at the judiciary for example the Supreme Court and the other federal courts those courts have the authority to declare an act of Congress that's been signed and approved by the President to be unconstitutional So that is an obvious check by the judiciary on both the executive and the legislative branches But the people who become judges become federal judges by virtue of being nominated by the President and confirmed by the Senate And so that really is a form of check and balance by the executive and the legislative branches on the courts So you see it works both ways

AIM:
* Why did the Framers create three branches of government?

PERFORMANCE OBJECTIVES
The students will be able to:
- identify the three branches of government
- describe the importance of separation of powers and of checks and balances in our democracy
- evaluate the importance of checks and balances

Stop Step Play

Chapter 39: Glossary

53530 Accessory
53531 Accuse
53532 Acquittal
53533 Adjudicate
53534 Administrative Agency
53535 Administrative Law
53536 Admiralty (Maritime) Law
53537 Adversary Proceeding
53539 Advisory Opinion
53540 Affirmance
53541 Affirmation
53542 Affirmative Action
53543 Affidavit
53544 Allegation
53545 Amendment
53546 Amnesty
53547 American Bar Association (ABA)
53548 Amicus Curiae
53549 Annul
53550 Answer
53551 Appeal
53552 Appellant
53553 Appellate Court
53554 Appellate Jurisdiction
53555 Appellee
53556 Apportionment
53557 Arraignment
53559 Arrest
53560 Arrest Warrant
53561 Articles
53562 Articles of Impeachment
53563 Attorney at Law
53564 Attorney General
53565 Authority
53566 Bail
53567 Bail Bondsperson
53568 Bailiff
53569 Bench Trial
53570 Bill of Attainder
53571 Bill of Rights
53572 Bind
53573 Blue Slip
53574 Book
53575 Brief
53576 Burden of proof
53577 Capital Offense
53578 Capitol Hill
53579 Case
53580 Case Law
53581 Censorship
53582 Certiorari, Writ of
53583 Charge
53584 Charge to the Jury
53585 Charter
53586 Checks and Balances
53587 Chief Justice
53588 Circuit Court
53589 Citizen
53590 City Courts
53591 Civil Action
53592 Civil Disobedience
53593 Civil Law (Private Law)
53594 Civil Liberty
53595 Civil Rights
53596 Claim
53597 Class Action
53598 Clemency
53599 Clerk (of the court)
53600 Client
53601 Closing Arguments
53602 Code law
53603 Code of Ethics
53604 Code of Military Justice
53605 Common Law
53606 Comparable Worth
53607 Compensation
53608 Concurrent Jurisdiction
53609 Concurring Opinion
53610 Conference
53611 Confess
53612 Confession
53613 Congress (United States)
53614 Conscription (Military Draft)
53615 Consent Decree
53616 Constitution
53617 Constitutional
53618 Constitutional Convention
53619 Constitutional Court
53620 Constitutionalism
53621 Constitutional Law
53622 Contempt of Court
53623 Contract
53624 Conviction
53625 Copyright
53626 Corruption of Blood
53627 Counterclaim
53628 Counsel
53629 County Seat
53630 Court
53631 Court-martial (Military Court)
53632 Courts of Appeals
53633 Court of General Jurisdiction
53636 Court of Last Resort
53637 Court of Limited Jurisdiction
53639 Court Packing Plan
53641 Court of Original Jurisdiction
53642 Crime
53643 Criminal Justice System
53644 Criminal Law
53645 Cross-Examination
53646 Cruel and Unusual Punishment
53647 Custody
53648 Deadlocked Jury
53649 Decision
53650 Declaration of Independence
53651 Declaratory Judgement
53652 De facto
53653 Defendant
53655 De jure
53656 Delegated (Expressed) Powers
53657 Delegation of Power
53658 Deliberate
53659 Democracy
53660 Deposition
53661 Discovery
53662 Discrimination
53663 Dismissal
53664 Dissenting Opinion
53665 District Court
53666 Divided Court
53667 Docket
53668 Doctrine
53669 Double Jeopardy
53671 Due Process of Law
53672 Eminent Domain
53673 Enforcement
53674 Enumerated Powers (Delegated, Expressed)
53675 Equity Law
53676 Error, Writ of
53677 Evidence
53678 Evolution

CONTINUED ON NEXT PAGE

Powers of the Supreme Court

Chapter Guide
Side Two

Chapter 23: *Miranda v. Arizona*

(4:00)

Frames 41126-47423

In this chapter of the videodisc, ABC News Law Correspondent Tim O'Brien relates the circumstances which led to this landmark decision establishing the rights of the accused. The video segment shows scenes from the crime and reviews the circumstances of the case, and features an interview with the police officer who arrested Ernest Miranda.

Related Visual Frames

Graphic:
47424 Miranda Rights

Fact file:
47428 Miranda v. Arizona

Focus question:*
47433

Glossary terms:
51590 Arrest
51648 Constitutional
51872 Reversal
51871 Retrial

Questions for Discussion

What was the issue involved in the case of *Miranda v. Arizona*?
What constitutional issue was involved in the case of *Miranda v. Arizona*?
On what basis did Miranda claim his constitutional rights had been violated?
Why was the Fifth Amendment used as the basis for *Miranda*'s appeal?
What were the arguments against *Miranda*'s appeal?
What was the Supreme Court decision in this case?
What were the dissenting opinions in this case?
How does the *Miranda* decision affect the police?
How does the *Miranda* decision limit police actions?
Why was the *Miranda* decision controversial?
Since the *Miranda* decision, the police must inform suspects of what rights before questioning them?
What are "Miranda cards"?
If the Fifth Amendment protecting against self-incrimination did not exist, what dangers might a suspect face?
What happened to Ernest Miranda once he was released from jail?
What were the effects of this decision on the U.S. government?
What were the results of the decision of *Miranda v. Arizona*?
Why is *Miranda v. Arizona* considered a landmark case?
If you were on the Supreme Court, how would you have voted in this case? Explain.

Transcript:

ABC News Law Correspondent Tim O'Brien It was 1963. The Los Angeles Dodgers would clobber the New York Yankees 4-zip in the World Series. The Beatles would soon invade America, and John F. Kennedy would soon be assassinated in Dallas In Phoenix, Arizona, a shy young girl was raped shortly after leaving work at this downtown theater, and few would notice, although her case would also alter history.

AIM:
What was significant about the case of Miranda v. Arizona?

PERFORMANCE OBJECTIVES
The students will be able to:
- identify the issues in the case of Miranda v. Arizona
- describe the constitutional issues involved in this case
- explain the decision of the Supreme Court in this case
- analyze the impact of the decision on the nation

Stop Step Play

CONTINUED FROM PREVIOUS PAGE

It was 11:30 at night, a few blocks from the woman's home. A high school dropout with a history of sex offenses named Ernesto Miranda forced her into his '53 Packard and then raped her. It was the car's license plate that led Carroll Cooley, then a sergeant on the Phoenix Police Department, to Miranda.

Carroll Cooley: We asked him to accompany us downtown so we could talk to him about the reason his car was seen in that location. And we asked him if he would stand in a lineup.

Tim O'Brien: The victim could not positively identify her assailant, but said this man, Miranda, "kind of looked like him."

Carroll Cooley: Ernie wanted to know how he had done in the lineup. He was anxious. I told him he didn't do very well. Ernie then said, "Well, I guess I better tell you about it."

Tim O'Brien: Miranda gave Sergeant Cooley this confession, admitting everything, acknowledging the confession was voluntary, ensuring he would be convicted of rape. But in 1966, the Supreme Court reversed that conviction in a ruling that still has some in law enforcement reeling.

Tim O'Brien: Chief Justice Earl Warren said Miranda's confession was inadmissable because Cooley never told him he had the right to a lawyer, to remain silent, that whatever he did say could be used against him. In 1963, the police just didn't do that.

Carroll Cooley: I think it was a bad decision. I do not agree with it. I don't now. I didn't then.

Tim O'Brien: The debate has not subsided.

Alan Dershowitz: That if you have a right, you have to know about the right. You can't have a right without intelligent information about that right. For years before Miranda, we, the "educated," had the right to remain silent, but they, the "uneducated," didn't have a right to remain silent. Miranda equalized that.

Tim O'Brien: In the years since Miranda was decided, the High Court has fine tuned the decision, allowing otherwise invalid confession to be used to show the defendant wasn't telling the truth at the trial. Miranda warnings are not required in an emergency, where public safety is threatened. And police don't have to tell a suspect that a lawyer is trying to contact him. Seldom are defendants set free because a confession is ruled inadmissable. Miranda himself was re-tried, reconvicted, and served five years of a 20-year sentence. Later, he enjoyed his notoriety, selling autographed Miranda cards to police officers. But it all ended here in 1976...at the Amapola bar, a grungy little place on the south side of Phoenix. Miranda accused a patron of cheating at cards and wound up getting stabbed to death. 23-year old Esquivel Perez, a Mexican national, was the key suspect. The first thing the police did was advise him of his rights. His Miranda Rights.

Police officer: You have the right to remain silent. Anything you say can be used against you in a court of law. You have the right to the presence of an attorney to assist you prior to questioning and be with you during questioning if you so desire. If you cannot afford an attorney, you have the right to have an attorney appointed for you prior to questioning. You understand your rights?"

Suspect: Yes, sir.

Resources
Chapter 63: Committees of the Senate

Visual Frames

Documents:

52123 Committee on Agriculture, Nutrition, and Forestry
52124 Committee on Appropriations
52125 Committee on Armed Services
52126 Committee on Banking, Housing, and Urban Affairs
52127 Committee on the Budget
52128 Committee on Commerce, Science, and Transport
52129 Committee on Energy and Natural Resources
52130 Committee on Environment and Public Works
52131 Committee on Finance
52132 Committee on Foreign Relations
52133 Committee on Governmental Affairs
52134 Committee on the Judiciary
52135 Committee on Labor and Human Resources
52136 Committee on Rules and Administration
52137 Committee on Small Business
52138 Committee on Veterans Affairs
52139 Select Committee on Ethics
52140 Select Committee on Indian Affairs
52141 Select Committee on Intelligence
52142 Special Committee on Aging

Powers of the Congress

Chapter Guide
Side One

Chapter 45: Ratifying Treaties

(:28)

Full Chapter

Video Segment Only
Frames 47298-48411

This chapter of the videodisc deals with the Senate's power to ratify or reject treaties with other nations. The video segment contains scenes from the attempts to ratify the Strategic Arms Limitation II (SALT II) treaty.

Related Visual Frames

Graphic:
47297 Article II, Section 2, Clause 2

Diagram:
48412 How a treaty is ratified

Glossary terms:
51509 Ratification
51582 Treaty

Historical example:
48415 Treaty of Versailles

Focus question: •
48416

Questions for Discussion

What is the role of the Senate in the ratification of treaties?
What are the steps to ratify a treaty?
What voting procedures are followed in the ratification of treaties?
What issues should a Senator consider when voting on the ratification of treaties?
What recent treaties has the Senate ratified?
What recent treaties has the Senate rejected?
It has been said that the power to ratify treaties is the most important power of the Senate. Do you agree or disagree? Why?
Why did the Senate reject the Treaty of Versailles and the SALT II Treaty?

Transcript:

Negotiator. We do have the repeated statements from the Soviet Union, vague and general though they are, about the interest in negotiating a ban on all new weapons systems.

Sen. Charles Percy: Whether I will support this treaty or not really depends upon my ultimate judgment as to whether it is in the national interest that we do so. I'm not in a position now to endorse this treaty and have notified the Administration that, if they stand firm that no understanding or reservations even could be accepted. I wouldn't vote to ratify it any more than I would the original treaty brought before us on Panama Canal

AIM:
• What is the role of the Senate in the ratification of treaties?

PERFORMANCE OBJECTIVES
The students will be able to:
• define "ratification"
• discuss the process of ratification of treaties by the Senate
• analyze the impact of the Senate in conducting foreign affairs through exercising the power to ratify treaties

Stop Step Play

Powers of the Congress

Chapter Guide
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Chapter 65: Glossary

Visual Frames

51196 Abdication
51197 Abiure
51198 Absentee Ballot
51199 Acquittal
51200 Ad Hoc Committee
51201 Administrative Agency
51202 Alien
51203 Allegiance
51204 Amendment
51205 Amnesty
51206 Anarchism
51207 Apportionment
51208 Appropriation (Congressional)
51209 Aristocracy
51210 Articles
51211 Articles of Confederation
51213 Articles of Impeachment
51214 At Large
51215 Australian Ballot
51216 Authoritarian
51217 Authority
51218 Authorization (Congressional Appropriation)
51219 Autocracy
51220 Autonomy
51221 Balanced Ticket
51222 Bicameral
51223 Bill of Attainder
51224 Bill of Rights
51225 Bipartisanship
51226 Block Grant
51227 Blue Slip
51228 Boston Massacre
51229 Boston Tea Party
51230 Bureaucracy
51231 Burgess
51232 Cabinet
51233 Cabinet Government
51234 Calendar
51235 Campaign
51236 Candidate
51237 Canvas
51238 Capitalism (Free Enterprise)
51239 Capitol
51240 Capitol Hill
51242 Casework
51243 Categorical Grant
51244 Caucus
51245 Census
51246 Census, Bureau of
51247 Charter
51248 Checks and Balances
51249 Chief Justice
51250 Citizen
51251 Citizenship
51252 Civil Service
51253 Clerk of the House
51254 Closed Primary
51255 Cloture
51256 Coalition
51257 Code of Ethics
51258 Colonialism
51259 Commerce Clause
51260 Committee of the Whole
51261 Committees of Correspondence
51262 Common Law
51263 Communism
51265 Compromise
51266 Concurrent Powers
51267 Concurrent Resolution
51269 Confederation
51270 Conference Committee
51271 Conflict of Interest
51272 Congress of the Confederation
51273 Congress of the United States
51274 Congressional District
51275 Congressional Oversight
51276 Congressional Petition
51277 Congressional Record
51278 Connecticut Compromise (Great Compromise)
51280 Conscription (Military Draft)
51281 Consensus
51282 Conservatism
51283 Constituency
51284 Constituent
51285 Constitution
51286 Constitutional
51287 Constitutional Convention
51288 Constitutional Democracy
51289 Constitutional Monarchy
51291 Continental Congress
51292 Constitutionalism
51293 Copyright
51294 Corruption of Blood
51295 Court of Appeals
51296 Declaration of Independence
51297 Delegation of Power
51298 Delegated (Expressed) Powers
51299 Democracy
51300 Democratic Party
51301 Desecrate
51302 Despotism
51303 Dictatorship
51304 Direct Democracy
51305 District Court
51306 Divine Right of Kings
51307 Division
51308 Donkey
51309 Dual Citizenship (Dual Nationality)
51310 Due Process of Law
51311 East India Company
51312 Elastic Clause
51314 Election
51315 Election Day
51316 Elector
51317 Electoral College
51318 Electoral Vote
51319 Electorate
51320 Elephant
51321 Embargo
51322 Eminent Domain
51323 Emolument
51324 Endorsement
51325 Enforcement
51326 Enumerated Powers (Delegated, Expressed)
51327 Excise Tax
51328 Executive Agreement
51329 Executive Branch
51330 Executive Oversight
51331 Expatriate
51332 Ex Post Facto Law
51333 Fairness Doctrine
51335 Fascism
51336 Federal Grant
51337 Federalism
51338 Federal Law
51339 Filibuster
51340 Franchise (Suffrage)
51341 Franking Privilege
51342 Freedom
51343 Free Enterprise (Capitalism)
51345 General Election
51346 Gerrymander
51347 Government

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51348 Grandfather Clause
51349 Grant
51350 Grass Roots
51351 Green Card
51352 Habeas corpus
51353 Hearing
51354 Honorarium
51355 House of Commons
51356 House of Lords
51357 Ideology
51358 Immunity (Congressional)
51359 Impeachment
51361 Imperialism
51362 Implied Powers
51363 Impounament
51364 Imposts
51365 Inauguration
51366 Incumbent
51367 Independent
51368 Inherent Power
51369 Initiative
51370 Interest Group
51371 International Law
51372 Interstate Compact
51373 Interstate Commerce
51374 Intrastate Commerce
51375 IRS (Internal Revenue Service)
51376 Item Veto
51377 Joint Committee
51378 Joint Resolution
51379 Joint Session
51380 Judicial Review
51382 Judiciary Branch
51383 Junkets
51384 Junta
51385 Jurisdiction
51386 Jus Sanguinis
51387 Jus Soli
51388 Justice
51389 Kitchen Cabinet
51390 Laissez-faire Capitalism
51391 Lame Duck
51392 Law
51393 Law of the Land
51394 Left (Political)
51395 Left Wing
51396 Legislation
51397 Legislative Branch
51398 Legislative Veto
51399 Legislature
51400 Legitimacy
51401 Letters of Marque and Reprisal
51402 Libel
51403 Liberalism
51404 Libertarianism
51405 Library of Congress
51406 Literacy Test
51407 Lobby
51408 Logrolling
51409 Loose Contructionist
51410 Mace
51411 Majority Leader
51412 Majority Rule
51413 Malfeasance
51414 Mandate
51415 Markup of a Bill
51416 Member of Congress
51417 Miaterm Election
51418 Militia
51419 Minister
51420 Minority Leader
51421 Minority Party
51422 Minor Party
51423 Misdemeanor
51424 Mixed Economy
51425 Moderate
51426 Monarchy
51427 Motion
51428 Multi-party System
51429 Municipal
51430 National Committee
51431 National Convention
51432 Nationalism
51433 National Guard
51434 Nationalization
51435 Naturalization
51436 Natural Law
51437 Necessary and Proper
51439 New Deal Legislation
51440 New Jersey Plan
51441 Nominating Petition
51442 Nomination
51443 Nominee
51444 Nonpartisan
51445 Oligarchy
51446 One Party System
51447 Open Primary
51448 Ordinance
51449 Parliament
51450 Parliamentary Procedure
51451 Parliamentary System
51452 Participatory Democracy
51453 Partisanship
51454 Party Leader
51455 Patent
51456 Patronage
51457 Peoole s Democracy
51458 Perquisite ("Perk")
51459 Petition
51460 Pigeonholing (a bill in Congress)
51461 Plebiscite
51462 Pluralism
51463 Pluralistic Democracy
51465 Plurality
51466 Pocket Veto
51467 Political Action Committee (PAC)
51468 Political Corruption
51469 Political Machine
51470 Political Party
51472 Politics
51473 Poll
51474 Poll Tax
51475 Pollwatcher
51476 Popular Vote
51477 Pork Barrel Legislation
51478 Positive Law
51479 Post Roca
51480 Power
51481 Power of the Purse
51482 Preamble
51483 Precinct
51484 Premier (Prime Minister)
51485 President
51486 President of the Senate
51487 President Pro Tempore
51488 Presidential System
51489 Pressure Group
51490 Primary Election
51491 Prime Minister (Premier)
51492 Private Bill
51493 Private Law
51494 Privatization
51495 Privilege
51496 Propaganda
51497 Proprietor
51498 Pro tempore
51499 Public Bill
51500 Public Interest Group
51501 Public Law
51502 Public Opinion
51503 Public Opinion Survey
51504 Public Policy
51505 Quorum
51506 Quorum Call
51507 Radical
51508 Ranking Member
51509 Ratification
51510 Readings of a Bill

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Resources
Chapter 62: Committees of the House of Representatives

Visual Frames

Documents:

52094 Committee on Agriculture
52095 Committee on Appropriations
52096 Committee on Armed Services
52097 Committee on Banking, Finance, and Urban Affairs
52098 Committee on the Budget
52099 Committee on the District of Columbia
52100 Committee on Education and Labor
52101 Committee on Energy and Commerce
52102 Committee on Foreign Affairs
52103 Committee on Government Operations
52104 Committee on House Administration
52105 Committee on House Administration
52106 Committee on the Judiciary
52107 Committee on Merchant Marine and Fisheries
52108 Committee on Post Office and Civil Service
52109 Committee on Public Works and Transportation
52110 Committee on Rules
52111 Committee on Science, Space and Technology
52112 Committee on Small Business
52113 Committee on Standards of Official Conduct (Ethics Committee)
52114 Committee on Veterans' Affairs
52115 Committee on Ways and Means
52116 Select Committee on Aging
52117 Select Committee on Children, Youth, and Families
52118 Select Committee on Hunger
52119 Permanent Select Committee on Intelligence
52120 Select Committee on Narcotics Abuse and Control

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Resources
Chapter 36: Executive Departments

Visual Frames

Fact file:
52043 The Direct Administration

Graphics:
52047 Department of Agriculture
52048 Department of Commerce
52049 Department of Defense
52050 Department of Education
52051 Department of Energy
52052 Department of Health and Human Services
52053 Department of Housing and Urban Development
52054 Department of the Interior
52055 Department of Justice
52056 Department of Labor
52057 Department of State
52058 Department of Transportation
52059 Department of the Treasury
52060 Department of Veteran Affairs

Stop Step Play

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Chapter 47: Glossary

Visual Frames

52650 Abdication
52651 Absentee ballot
52652 Administration
52653 Administrative Agency
52654 Allegiance
52655 Ambassador
52656 Amendment
52657 Amnesty
52658 Articles
52659 Articles of Impeachment
52660 Australian Ballot
52661 Authority
52662 Autocracy
52663 Balanced Ticket
52664 Bill of Rights
52665 Bipartisanship
52666 Blue Slip
52667 Bureaucracy
52668 Cabinet
52669 Campaign
52670 Candidate
52671 Capitol
52672 Caucus
52673 Census
52674 Checks and Balances
52675 Chief Executive
52676 Chief Justice
52677 Chief of State
52678 Citizen
52679 Citizenship
52680 Civil Service
52681 Closed Primary
52682 Coalition
52683 Code of Ethics
52684 Commander in Chief
52685 Commission
52686 Compromise
52687 Concurrent
52688 Confederation
52689 Conflict of Interest
52690 Connecticut Compromise
52692 Conscription
52693 Conservatism
52694 Constituency
52695 Constituent
52696 Constitution
52697 Constitutional
52698 Constitutional Convention
52699 Constitutional Democracy
52700 Constitutional Monarchy
52702 Continental Congress
52703 Constitutionalism
52704 Council of Economic Advisers (CEA)
52705 Declaration of Independence
52706 Delegated (Expressed) Powers
52707 Delegation of Power
52708 Democracy
52709 Democratic Party
52710 Deregulation
52711 Despotism
52712 Dictatorship
52713 Diplomacy
52714 Diplomatic Agent (Diplomat)
52715 Diplomatic Channels
52716 Diplomatic Immunity
52717 Diplomatic Recognition
52718 Diplomatic Relations
52719 Dipomat in Chief
52720 Direct Democracy
52721 Divine Right of Kings
52722 Donkey
52723 Due Process of Law
52724 Election
52725 Election Day
52726 Elector
52727 Electoral College
52728 Electoral Vote
52729 Electorate
52730 Elephant
52731 Emergency Powers
52732 Emolument
52733 Endorsement
52734 Enforcement
52735 Enumerated (Delegated Expressed) Powers
52736 Executive Agreement
52737 Executive Branch
52738 Executive Order
52739 Executive Oversight
52740 Executive Privilege
52742 Favorite Son/Daughter
52744 Federalism
52745 Foreign Policy
52746 Franchise (Suffrage)
52747 Freedom
52748 General Election
52749 Government
52750 Grass Roots
5275.1 Gunboat Diplomacy
52752 Honeymoon Period
52753 Ideology
52754 Impeachment
52756 Implied Powes
52757 Impoundment
52758 Inauguration
52759 Incumbent
52760 Independent
52761 Independent Regulatory Agency/Commission
52762 Inherent Power
52763 Interest Group
52764 International Law
52765 Item Veto
52766 Joint Resolution
52767 Joint Session
52768 Judicial Review
52770 Judiciary Branch
52771 Junta
52772 Keynote Address
52773 Kitchen Cabinet
52774 Lame Duck
52775 Law
52776 Law of the Land
52777 Left (Political)
52778 Left Wing
52779 Legislative Branch
52780 Legislative Veto
52781 Liberalism
52782 Libertarianism
52783 Literacy Test
52784 Lobby
52785 Majority Rule
52786 Mandate
52787 Mass Media
52788 Media Event
52789 Midterm Election
52790 Minor Party
52791 Minority Party
52792 Moderate
52793 Multi-Party Sytem
52794 National Committee
52795 National Convention
52796 Nationalism
52797 National Guard
52798 New Deal Legislation
52799 New Jersey Plan
52800 News

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52801 News Release (Handout)
52802 News Agency (service)
52803 Nominating Petition
52804 Nomination
52805 Nominee
52806 Nonpartisan
52807 One-Party System
52808 Open Primary
52809 Oval Office
52810 Pardon
52811 Parliamentary System
52812 Participatory Democracy
52813 Partisanship
52814 Party Leader
52815 Patronage
52816 Plank
52817 Platform
52818 Pocket Veto
52819 Political Action Committee (PAC)
52820 Political Machine
52821 Political Party
52823 Politics
52824 Poll
52825 Poll Tax
52826 Pollwatcher
52827 Popular Vote
52828 Power
52829 Preamble
52830 Precinct
52831 Premier (Prime Minister)
52832 President
52833 President Elect
52835 Presidential Debates
52837 Presidential Election Campaign Fund
52838 Presidential Electors
52839 Presidental Libraries
52840 Presidential Power
52841 Presidential News Conference
52842 Presidential Primary
52843 Presidential Succession
52844 Presidential System
52845 Presidential Transition
52846 President of the Senate
52847 President Pro Tempore
52848 Press Conference
52849 Primary Election
52850 Prime Minister (Premier)
52851 Privilege
52852 Propaganda
52853 Public Interest Group
52854 Public Opinion
52855 Public Opinion Survey
52856 Ratification
52857 Realignment
52858 Representative Democracy
52860 Reprieve
52861 Republic
52862 Republican Party
52863 Reserved Powers
52864 Residency Requirement
52865 Right (Political)
52866 Right Wing
52867 Rule of Law
52868 Runoff Election
52869 Sample
52870 Sampling Error
52871 Select (Special) Committee
52872 Separation of Powers
52873 Slate (of Candidates)
52874 Sovereignty
52875 Special (Select) Committee
52876 Special Election
52877 Special Interest Group
52878 Special Session (of Congress)
52879 Spoils System
52880 Standing Committee
52881 Straight Party Ticket
52882 Straw Vote
52883 Stump
52885 Suffrage (Franchise)
52886 Summit Diplomacy
52887 Supremacy Clause
52888 3/5ths Compromise
52890 Third Party
52891 Ticket Splitting
52892 Traitor
52893 Treason
52894 Treaty
52895 Two Party System
52896 Unconstitutional
52897 Uncontested Election
52898 Unitary Government
52899 United States
52900 U S Constitution
52901 U S Supreme Court
52902 Veto
52903 Veto Override
52904 Vice President
52905 Virginia Plan
52906 Voter Registration
52907 Ward
52908 White House
52909 White Primary

Powers of the President

Chapter Guide
Side Two

Chapter 6: Roles of the President

(:27)

Fromes 9339-10175

In this chapter of the videodisc, former President Jimmy Carter discusses the extra-constitutional roles of the President. In the video segment, President Carter describes how a President is the inspirational leader of the country, and the spokesperson for all the democratic nations of the world.

Related Visual Frames

Focus question: *
10176

Glossary terms:
52147 Authority
52194 Democracy
52242 Implied Powers
52309 Politics
52314 Power
52318 President

Questions for Discussion

What does President Jimmy Carter mean when he says, "The President is the inspirational leader of our country"?

In what ways can the President:
- inspire the people;
- speak for the American people;
- point out the unmet need of the people;
- herald the achievements of the American people; and
- challenge the future.

Give examples of how Presidents have used each of these powers.

Which is the most important job of the President?

What does President Jimmy Carter mean when he says the President is "spokesman of the democratic nations on earth."

Do you agree or disagree with President Jimmy Carter?

What are the limitations to the influence of the extra-constitutional powers?

Transcript:

Jimmy Carter: Well, in the first place, the constitution doesn't mention that the President in effect, is an inspirational leader for our country and he speaks for the American people. he points out to them the unmet needs, or the achievements or the challenges of the future. The president, at least since the second world war has become a spokesman for the Democratic nations on earth. The most powerful voice of any political leader in the world.

AIM:
* In what ways does the President represent the American people?

PERFORMANCE OBJECTIVES
The students will be able to:
- identify the extra-constitutional powers of the President
- describe the ways the President represents the American people
- evaluate the importance of the extra-constitutional powers of the President

Stop Step Play

SUPPLEMENTAL READING AND EXERCISES

Supplemental Reading And Exercises

1. Biology

Contemporary's Pre-GED Science Skills

Chapter 2: Plants and Animals	Pages 37 - 56
Chapter 3: The Human Body	Pages 72 - 95

Contemporary's GED Science

Chapter 5: Plant and Animal Biology	Pages 92 - 121
Chapter 6: Human Biology	Pages 122 - 151

2. Earth Science

Contemporary's Pre-GED Science

Chapter 6: Earth Science	Pages 166 - 191

Contemporary's GED Science

Chapter 7: Earth Science	Pages 153 - 183

3. Chemistry/Physics

Contemporary's Pre-GED Science

Chapter 4: Everyday Physics	Pages 107 - 128
Chapter 5: Chemistry	Pages 137 - 159

Contemporary's GED Science

Chapter 8: Chemistry	Pages 184 - 220
Chapter 9: Physics	Pages 221 - 257

4. Geography

Contemporary's Pre-GED Social Studies

Chapter 2: Geography: Reading Maps	Pages 68 - 85

Contemporary's GED Social Studies

Chapter 8: Geography	Pages 210 - 240

5. Political Science

Contemporary's Pre-GED Social Studies

Chapter 5: Evaluating Social Studies Materials	Pages 142 - 169

Contemporary's GED Social Studies

Chapter 6: Political Science	Pages 147 - 175

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