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DOCUMENT NUMBER: 9203556
DIRECTORATE STATUS

STATUS I

FROM: HANNA, Gary: U.S. DEPARTMENT OF EDUCATION

TO: DR. D.A. BROMLEY

DATE OF
CORRESPONDENCE: 12/04/92

SUBJECT: HE IS FORWARDING A MEMORANDUM REGARDING THE
EXECUTIVE ORDER ON IMPROVING MATHEMATICS AND SCIENCE
EDUCATION.

DIRECTORATE
ASSIGNED: INTERNATIONAL/POLICY
STAFF
ASSIGNED:

ACTION
REQUIRED: AS/IF NECESSARY
STAFF
ACTION:

SENDER'S DUE DATE:
OSTP DUE DATE: 12/23/92
DATE COMPLETED: STAFF DUE DATE
DATE COMPLETED/DEPT:

COPIES TO: D. Allan Bromley
ADMINISTRATION

WHITE HOUSE TRACKING #: CONTACT PERSON:
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OSTP RECEIVED: 12/09/92
FILE: P-EDUCATION

DEPT RECEIVED:

CENTRAL FILES:



35576

UNITED STATES DEPARTMENT OF EDUCATION
OFFICE OF INTERGOVERNMENTAL AND INTERAGENCY AFFAIRS

DEC -4 1992

TO : FICE Members

SUBJECT: Executive Order on Improving Mathematics
and Science Education

As most of you know, the President signed Executive Order 12821 Improving Mathematics and Science in Support of the National Education Goals.

The Order encourages each agency to assist in the mathematics and science education of the nation's students, teachers, parents and the public. It authorizes the training of elementary-secondary school teachers; the encouragement of Federal employee participation in math-science education programs; the transfer of excess Federal education related equipment to schools; the development agency plans to carry out the Order; and specifies a Federal structure to help coordinate the administration of these activities. A copy of Executive Order 12821 is attached for your information.

Also attached, is a pamphlet and a flyer announcing a variety of publications for parents from the Department of Education which may be of interest to your employees or program constituents. Please give me a call if I can be of assistance.

Gary Hanna
Federal Interagency Committee
on Education
(202) 401-0429

Attachments

Publications for Parents



Helping You Help Your Child Learn

U.S. Department of Education
Office of Educational Research
and Improvement

United States
Department of Education
Washington, D.C. 20208-5570

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U.S. Department of Education
Permit No. G-17

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POP 91-9201R
January 1992
EEO/ENR 91-19

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1/92

Name

Address

City, State, ZIP

Single copies of "Publications for Parents" may be ordered directly from: OERI, 555 New Jersey Avenue NW, Washington, DC 20208-5641. Cost: Free.

Did you know that a walk through the neighborhood or a short car trip can provide opportunities for teaching your child geography? Or that such common household projects as shopping and cooking can help your child understand that math plays a key role in many everyday activities? Or that more and more public libraries now offer programs especially for infants and toddlers?

Recognizing that the vast majority of parents are eager to foster their children's natural enthusiasm for learning and to help them to succeed in school, the U.S. Department of Education's Office of Educational Research and Improvement (OERI) has developed a series of easy-to-read books and pamphlets designed specifically to help parents help their children learn.

All of the materials described here are low-cost, easy-to-use, and grounded in sound educational research and proven practice. Each one provides straightforward ideas that you can use with confidence to help your child learn and succeed in school.

Now I ask all Americans to be points of light in the crusade that counts the most: the crusade to prepare our children and ourselves for the exciting future that looms ahead. At any moment in every mind, the miracle of learning beckons us all.

President George Bush, April 18, 1991
in a White House address announcing
AMERICA 2000: A National Education Strategy

This pamphlet and the publications listed in it are public documents and may be reproduced in whole or in part without permission. Please credit the United States Department of Education.

Helping Your Child Learn Geography

A visit to an ethnic restaurant, a stroll through the neighborhood, or a short drive to a nearby town all provide excellent opportunities for steering your children's natural curiosity toward a knowledge of geography. These—and many other routine activities—can become occasions to educate youngsters about the world around us.

Published in cooperation with the Department of Interior's U.S. Geological Survey, *Helping Your Child Learn Geography* contains a wealth of ideas for informal and easy-to-do activities that can help prepare youngsters up through the age of 10 for continued, academic forays into geography. And because geography is more than simply knowing where things are located on a map, the activities and games are organized around five specific themes that are currently used in many schools.

This beautifully illustrated booklet includes a glossary of geographic terms, a listing of where to get free or inexpensive materials and maps, and a list of books for children—picture books, story books, and atlases—that will help them learn about the world.

Cost: 50 cents
Consumer Information Center, 414Y



Growing Up Drug Free: A Parent's Guide To Prevention

Teaching children how to say no to drugs is one of the most critical challenges parents today face. Still, many parents hesitate to discuss alcohol and other drug use with their children—often because they don't know what to say or because they believe their own children couldn't become involved with illegal substances.

Growing Up Drug Free: A Parent's Guide to Prevention is designed to help you take an active role in drug prevention *before* your children have a problem. Drawing on the advice of experts in drug prevention and in child development, the handbook outlines what children at four key stages of development—from pre-school to high school—should know about drugs, and it suggests family activities to reinforce children's motivation to avoid alcohol and other drugs.

This comprehensive, 50-page handbook provides some general guidelines for talking with your children about alcohol and drugs, as well as suggestions for communicating with youngsters of varying ages. It also offers tips on recognizing whether a child is using drugs, strategies for fostering school and community action, and a detailed glossary describing specific drugs and their effects.

Cost: Free
Consumer Information Center, 508Y

[Note: Also available in Spanish. Cost: Free.
Order from: National Clearinghouse for
Alcohol and Drug Information, P.O. Box 2345,
Rockville, MD 20852.]

Helping Your Child Use the Library

It's never too soon to take your children to the library! More and more public libraries are introducing programs for toddlers 18- to 36-months-old, and there are even some for infants! Of course, programs and resources for children over age 3 abound.

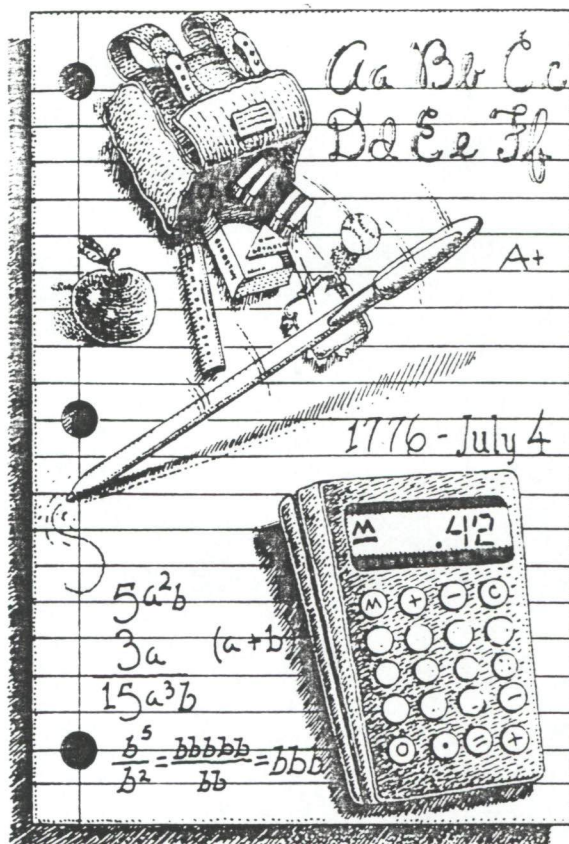
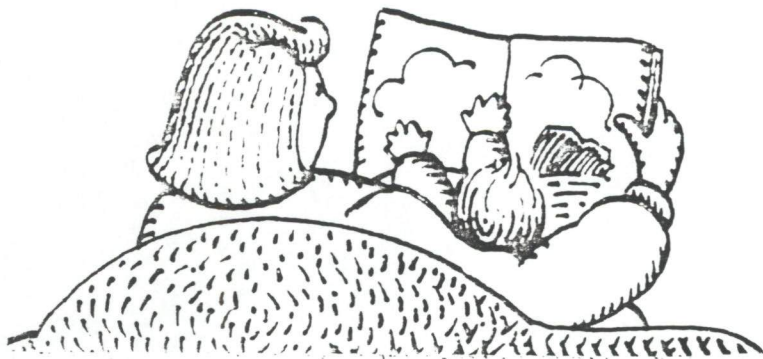
Now, you can learn more about what libraries have available for you and your children by obtaining a copy of *Helping Your Child Use the Library*. This booklet offers suggestions for you—no matter what age your children—on how to help them become good readers and to get the most out of the abundant resources available through libraries. It contains ideas to interest your children in reading, tips for visiting the library with them and for when they visit the library alone, and a comprehensive overview of the many services designed especially for preschoolers, school-age youngsters, and teens.

Developed with the cooperation of the American Library Association, *Helping Your Child Use the Library* also contains information about services for special children and for adults, and suggests additional sources of information about books and reading.

Cost: 50 cents

Consumer Information Center, 415Y

[Note: Also available in Spanish. Cost: Free.
Order directly from OERI, 555 New Jersey Avenue, NW,
Washington, DC 20208-5641.]



Help Your Child Do Better in School

Many children do poorly in school because they lack the kinds of behavior and attitudes that result in classroom success. For example, they may be easily distracted from their studies or have difficulty remembering facts and ideas. They may lack interest in their schoolwork or possess poor study habits. As a parent, however, you can help your child change these behaviors and attitudes. This easy-to-read leaflet describes specific strategies that can help children at all grade levels to become better students.

Cost: 50 cents

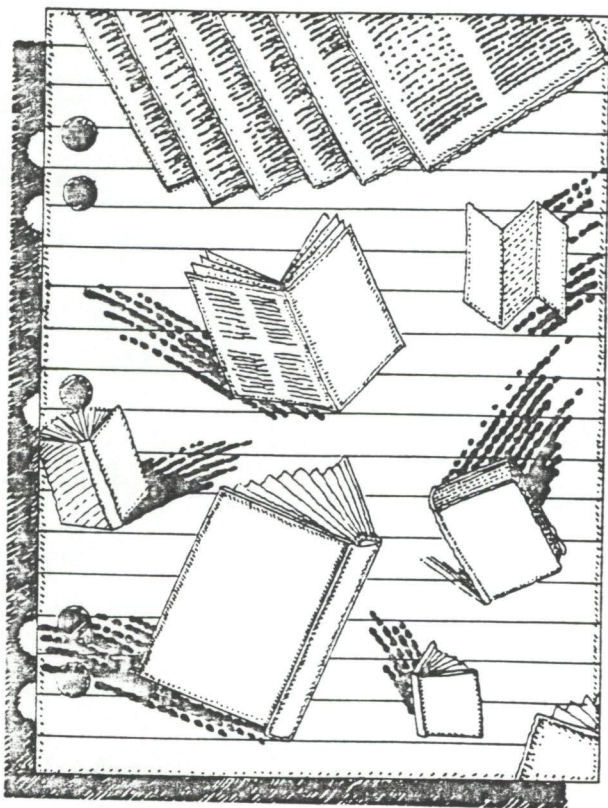
Consumer Information Center, 410Y

Help Your Child Become a Good Reader

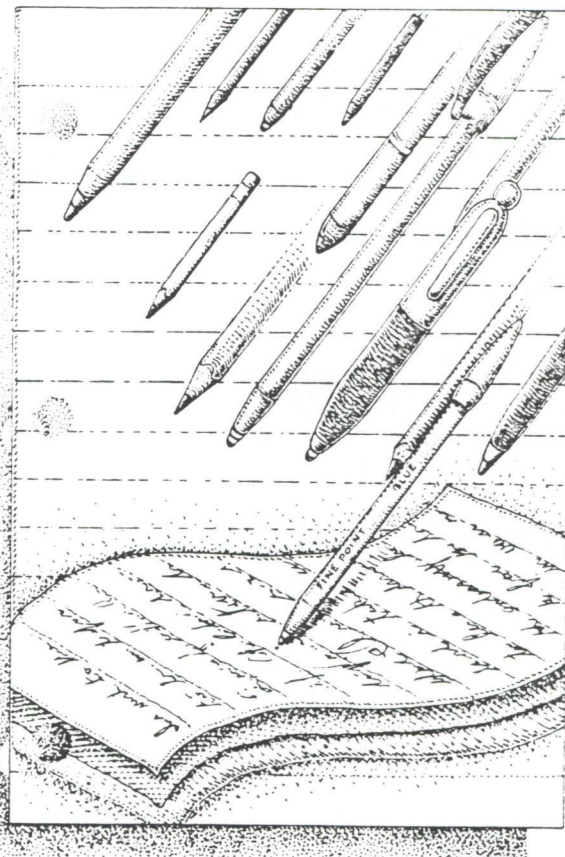
If you want your children to read well and with understanding—to get "hooked on books"—begin early to lay the right foundation. Youngsters who are good readers have parents who encourage their success and interest in reading and who take time to read aloud to them. This leaflet describes over a dozen activities that will help make your children successful readers, and it discusses important factors that influence success and interest in reading.

Cost: 50 cents

Consumer Information Center, 409Y



[NOTE: Books for Children, a descriptive list of the best books published in the past year for children in preschool through middle school, is available for \$1 from the Consumer Information Center, 101Y.]



Help Your Child Learn To Write Well

For a variety of reasons, many schools are unable to give children sufficient instruction in writing. Study after study shows that students' writing lacks clarity, coherence, and organization. As a parent, however, you can play a big role in promoting your children's writing skills. By employing some "helping" strategies that are both simple and fun, you can help your children learn to write well—and to enjoy doing it. This leaflet tells you how.

Cost: 50 cents

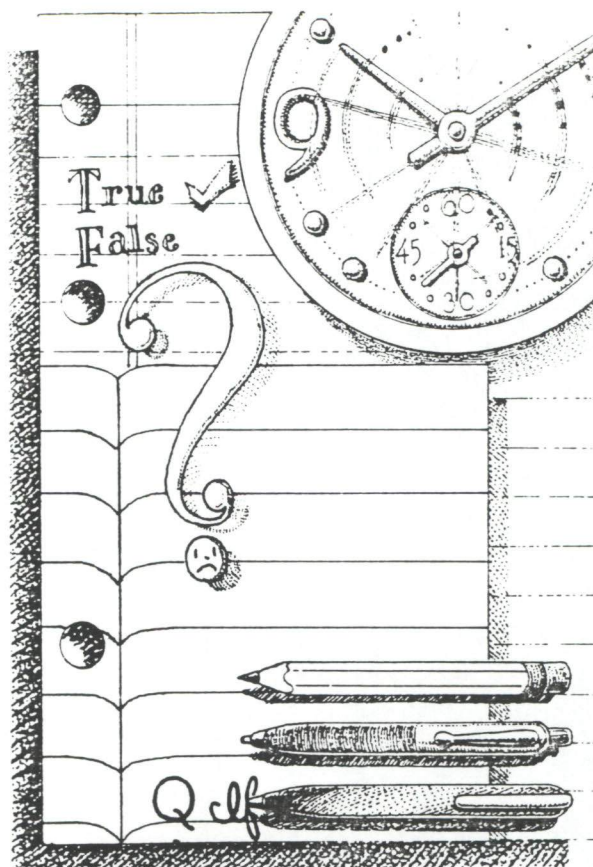
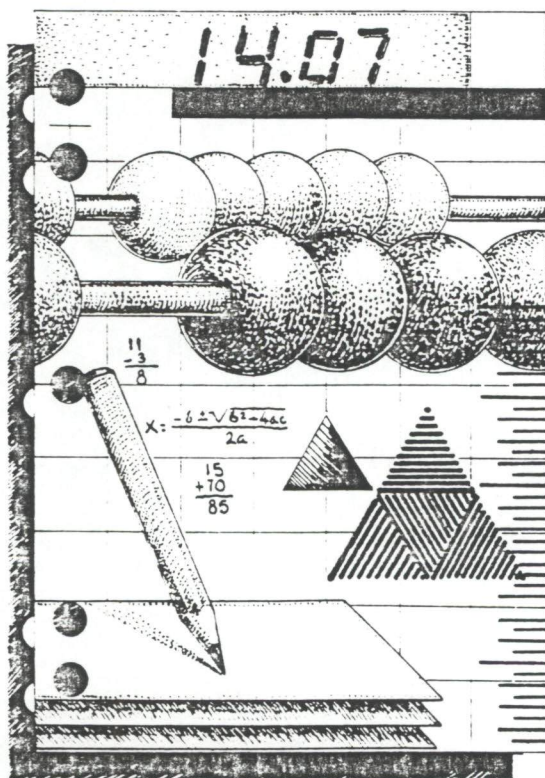
Consumer Information Center, 413Y

You Can Help Your Young Child Learn Mathematics

Knowing mathematics is more important today than ever before. No matter what they want to be when they grow up, your children will need good math skills. Youngsters are natural problem solvers, however, so it's not difficult to encourage their curiosity about quantities, patterns, and shapes. Many routine family activities offer opportunities for you to do just that. *You Can Help Your Young Child Learn Mathematics* points out how shopping, cooking, traveling, and even play can be used to teach young children important mathematical concepts. This eight-page pamphlet also offers tips on evaluating the kind of math instruction your children are receiving in school.

Cost: 50 cents

Consumer Information Center, 412Y



Help Your Child Improve in Test-Taking

Tests are part of a child's life. They may be used to measure basic skills, assess subject learning, or determine grade placement. And the ability to do well on tests can help throughout life in such things as obtaining a driver's license, trying out for sports, or getting a job. You can help your children develop this ability by encouraging them to use some simple techniques that will help avoid "test anxiety." In addition to describing these strategies, *Help Your Child Improve in Test-Taking* includes some "dos and don'ts" for parents along with suggestions for followup after the test.

Cost: 50 cents

Consumer Information Center, 411Y

Becoming a Nation of Readers: What Parents Can Do

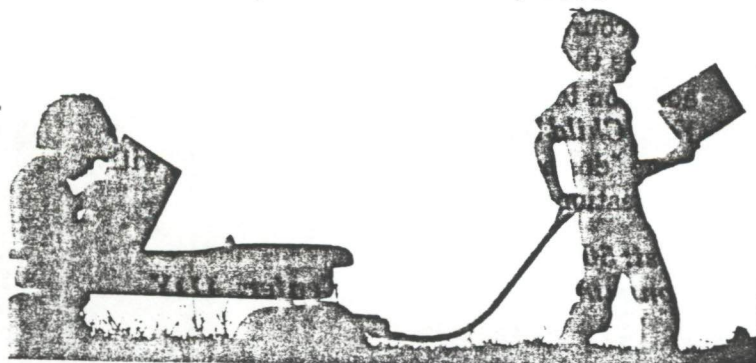
Because children's attitudes toward reading are shaped in the home, parents play a critical role in determining whether their youngsters become successful readers. While reading to children is the most important way to encourage them to read, there are many other strategies to stimulate their interest in the written word.

Becoming a Nation of Readers: What Parents Can Do offers straightforward, clear information on how you can help your children—from preschool through elementary age—become good readers. The booklet not only explains what reading is and how reading skills develop over time, but it discusses what to look for in good programs for both beginning and developing readers. Also included are ideas and sources of information for home activities that will improve reading achievement and suggestions for monitoring your children's progress throughout the school years.

Becoming a Nation of Readers: What Parents Can Do is a distillation of findings from *Becoming a Nation of Readers*, the influential report of the Commission on Reading which examined and analyzed a vast body of research on how reading develops and on what conditions foster effective reading development.

Cost: 50 cents

Consumer Information Center, 408Y



Choosing a School for Your Child

Schools are not all alike, and selecting which school a child will attend is one of the most important decisions any parent can make. Parents, however, often face difficulties in identifying the options they have for their children and in determining which school will best help them to flourish. *Choosing a School for Your Child* addresses these problems by providing a step-by-step guide through the selection process for both public and private schools.

This booklet describes the kinds of schools that may be available and supplies detailed information about which factors you should consider in evaluating individual schools. For example, is the curriculum appropriate for your children? Are you comfortable with the school's philosophy and with its policies in such areas as homework and discipline? Are you convinced that the school is achieving its goals?

Choosing a School for Your Child also incorporates suggestions on how to undertake school visits, as well as advice on getting the child enrolled at the desired school. It contains a checklist that can be used for recording information on specific schools, examines strategies for when no suitable school can be found, and includes a list of additional information sources.

Cost: 50 cents

Consumer Information Center, 471X

[Note: Also available in Spanish. Cost: Free.
Order directly from OERI, 555 New Jersey Avenue, NW
Washington, DC 20208-5641.]

Presidential Documents

Title 3—

Executive Order 12821 of November 16, 1992

The President

Improving Mathematics and Science Education in Support of the National Education Goals

By the authority vested in me as President by the Constitution and the laws of the United States of America, including the provisions of the Stevenson-Wydler Technology Innovation Act of 1980, as amended (15 U.S.C. 3701, *et seq.*), and the Federal Property and Administrative Services Act of 1949, ch. 288, 63 Stat. 377 (codified as amended in scattered sections of the United States Code), and in order to ensure that Federal departments, agencies, and laboratories assist in mathematics and science education to meet the National Education Goals, it is hereby ordered as follows:

Section 1. Assistance in Mathematics and Science Education. (a) Each executive department and agency (hereinafter referred to as "agency") that: (i) has a scientific mission; (ii) employs significant numbers of scientists, mathematicians, and engineers; or (iii) has a Federal laboratory; as determined by the Committee established by section 2(d) of this order, shall, to the maximum extent permitted by law:

(1) Assist in the mathematics and science education of our Nation's students, teachers, parents, and the public by establishing programs at their agency to provide for training elementary and secondary school teachers to improve their knowledge of mathematics and science. Such programs, to the maximum extent possible, shall involve partnerships with universities, State and local elementary and secondary school authorities, corporations, and community based organizations. These activities shall be coordinated with other relevant Federal teacher training programs (e.g., those administered by the National Science Foundation, the Department of Education, and the Department of Energy). Because of its extensive experience in teacher training programs at its Federal laboratories, the Department of Energy, when requested by other agencies, shall assist in the development of these activities.

(2) Provide brief periods of excused absence for Federal employees to assist in the conduct of mathematics and science education programs, in accordance with guidelines of the Office of Personnel Management.

(b) Develop, within 6 months of the issuance of this order, an implementation plan to fulfill the requirements of this section. The plan shall be consistent with approved agency budget totals. The plan shall be coordinated through the Committee on Education and Human Resources of the Federal Coordinating Council for Science, Engineering, and Technology.

Sec. 2. Transfer of Education-Related Federal Equipment to Elementary and Secondary Schools. (a) To the maximum extent permitted by law, all agencies shall give highest preference to elementary and secondary schools in the transfer or donation of education-related Federal equipment. All such transfers to the schools shall be made at the lowest cost permitted by law.

(b) Each agency, to the maximum extent permitted by law, shall:

(1) Identify and transfer excess education-related Federal equipment at that agency that can be transferred to elementary and secondary schools by:

(A) Direct transfer of excess Federal research equipment in accordance with the provisions of subsection 3710(i) of the Stevenson-Wydler Technology Innovation Act of 1980, as amended (15 U.S.C. 3710(i)). The transfer of such

excess equipment shall be reported to the General Services Administration (GSA); or

(B) Reporting such excess equipment to the GSA for donation when declared surplus in accordance with the provisions of section 203(j) of the Federal Property and Administrative Services Act of 1949, as amended (40 U.S.C. 484(j));

(2) Allow the elementary and secondary schools sufficient time to select available education-related Federal equipment before it is disposed of elsewhere;

(3) Provide training and technical assistance, where possible, to recipients of education-related Federal equipment to ensure that the equipment will be utilized to its full capability; and

(4) Attempt to provide education-related Federal equipment to those elementary and secondary schools with the greatest need or to the recipients of federally funded mathematics and science projects where the equipment would further enhance the progress of the project.

(c) The GSA shall:

(1) To the maximum extent permitted by law, ensure that elementary and secondary schools are notified of the opportunity to obtain education-related Federal equipment, and, where practical, provide to elementary and secondary schools a current listing of education-related Federal equipment that is available for transfer, and, when requested, provide a current listing of this available equipment to agencies; and

(2) Maintain a record of the education-related Federal equipment provided to elementary and secondary schools pursuant to this order.

(d) There is hereby established a Coordinating Committee on Education-Related Federal Equipment (Committee). The Committee membership shall include, but not be limited to, representatives of the Departments of Defense, Education, Energy, and Health and Human Services, the National Science Foundation, the General Services Administration, and the National Aeronautics and Space Administration.

(1) The Co-chairs of the Committee shall be the Administrator of General Services and the Secretary of Education, or their designees.

(2) The Committee shall assess the availability of appropriate education-related Federal equipment and mechanisms for expeditious notification and transfer of the equipment to elementary and secondary schools and shall resolve issues that may arise in implementing this order.

(3) The Committee shall inform, as necessary, non-Federal groups (e.g., National Governors Association, State Agencies for Surplus Property, etc.) of issues concerning the transfer of education-related Federal equipment.

(4) The Committee may consult with the Committee on Education and Human Resources of the Federal Coordinating Council for Science, Engineering, and Technology concerning activities outlined in this order, particularly those activities listed in section 1 of this order.

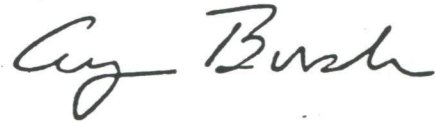
Sec. 3. Definitions. For the purposes of this order:

(a) "Education-related Federal equipment" means excess or surplus personal computers and related peripheral equipment, research equipment, and education-related equipment that is appropriate for use in mathematics and science curricula in elementary and secondary school education.

(b) "Elementary and secondary schools" means individual public or private educational institutions encompassing kindergarten through twelfth grade, as well as public school districts.

(c) "Federal laboratories" has the meaning set forth in the Stevenson-Wydler Technology Innovation Act of 1980 (15 U.S.C. 3710a(d)(2)).

(d) "Research equipment" means excess or surplus Federal property appropriate for mathematics and science education activities at the elementary and secondary education levels, as defined by and in accordance with the regulations of the agency that owns the research equipment.



THE WHITE HOUSE,
November 16, 1992.

[FR Doc. 92-28201

Filed 11-16-92; 4:31 pm]

Billing code 3195-01-M

Want to Help Your Child?

Then you will want to send for a new series of publications from the U.S. Department of Education. The books are designed to help parents help their young children learn. Each book includes simple, fun activities for parents and children to do together. At the end of each is a list of interesting resources to help parents learn more and continue the fun. The books are:

Helping Your Child Get Ready for School

with activities for children from birth through age 5

Helping Your Child Learn Science

for 3- through 10-year-olds

Cómo ayudar a sus hijos a aprender ciencia

Spanish translation of the science book

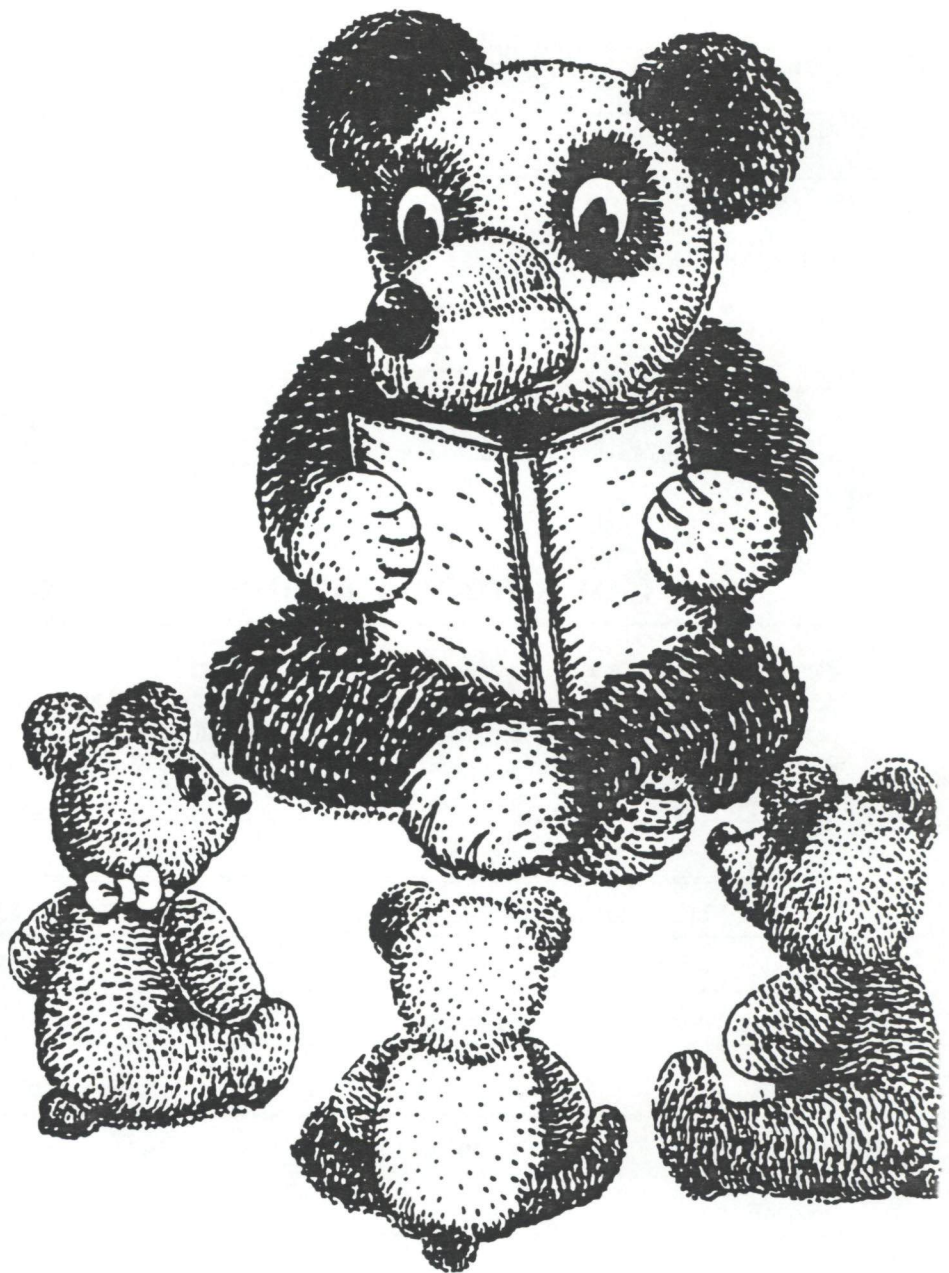
Helping Your Child Succeed in School

for school age children from 5 through 11

Helping Your Child Use the Library

from birth through high school

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Ordering information for the books is on the back.

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P4

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To fax your orders (202) 512-2250

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	065-000-00522-1	Helping Your Child Get Ready For School (Packs of 50)	\$36.00	
	065-000-00520-4	Helping Your Child Learn Science (Packs of 50)	\$36.00	
	065-000-00521-2	Cómo ayudar a sus hijos a aprender ciencia (Single copies)	\$ 3.25	
	065-000-00521-2	Cómo ayudar a sus hijos a aprender ciencia (Packs of 50)	\$36.00	
	065-000-00523-9	Helping Your Child Succeed in School (Single copies)	\$ 3.25	
	065-000-00523-9	Helping Your Child Succeed in School (Packs of 50)	\$36.00	
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11/92

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R. Woods, Consumer Information Center, Pueblo, CO 81009.

Title	Item #	Price	Quantity	Total \$
Helping Your Child Get Ready for School	161Y	\$3.25		
Helping Your Child Learn Science	160Y	\$3.25		
Helping Your Child Use the Library	415Y	50¢		
Totals				\$

(Please type or print. This will be used to return your books to you.)

NAME

ADDRESS

CITY, STATE, ZIP

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ORIGINATOR: 02

STATUS I

DIRECTORATE STATUS

FROM: SPOFFORD, Tenney

TO: DR. D.A. BROMLEY

DATE OF
CORRESPONDENCE: 10/27/92

SUBJECT: HE IS FORWARDING COPIES OF HIS LESSON PLAN AND ASKS
FOR DR. BROMLEY'S ASSISTANCE IN GETTING IT STARTED.

DIRECTORATE

STAFF

ASSIGNED: INTERNATIONAL/POLICY

ASSIGNED:

ACTION

STAFF

REQUIRED: DIRECT REPLY

ACTION:

SENDER'S DUE DATE:

OSTP DUE DATE: 11/16/92

STAFF DUE DATE

DATE COMPLETED:

DATE COMPLETED/DEPT:

COPIES TO: D. Allan Bromley

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FILE: P-EDUCATION

CENTRAL FILES:

27 OCTOBER 1992

MR. TENNEY R. SPOFFORD
36 SUFFOLK DOWN
SHOREHAM , NEW YORK
11786

DOCTOR D. ALLAN BROMLEY
DIRECTOR
OFFICE OF SCIENCE AND TECHNOLOGY
OLD EXECUTIVE OFFICE BUILDING # 358
WASHINGTON , D.C.
20506

DEAR DOCTOR BROMLEY ,

IF WE CAN'T GET PRESIDENT BUSH REELECTED NEXT WEEK , THEN HIS TIME AND YOUR TIME LEFT IN OFFICE MAY UNFORTUNATELY BE GROWING SHORT. GIVEN HIS ACHIEVEMENTS ON THE INTERNATIONAL SCENE , AND THE IMPETUS YOU HAVE PROVIDED FOR SCIENTIFIC PROGRAMS ; ALL BUT OVERLOOKED BY CAMPAIGN STRATEGISTS ; THE OUTLOOK FOR REELECTION IS BLEAK , BUT NOT IMPOSSIBLE.

YOUR ACHIEVEMENTS AS A PHYSICIST , ENGINEER , RESEARCHER AND TEACHER ARE LEGENDARY AND YET YOU SEEM TO GATHER STRENGTH AS YOU GET OLDER. THE OLDER THE VIOLIN THE SWEETER THE MUSIC. I WOULD LIKE TO TAP THAT STRENGTH TO TRY TO FULFILL ONE OF MY OWN FINAL MISSIONS AS A TEACHER. I'VE HEARD ENOUGH OF THE SAME EDUCATIONAL TUNES - MORE TEACHER: EDUCATION , - COMPUTERS - VIDEO - MOVIES - CALCULATORS - NATIONAL TESTS - PRIVITIZATION - GROUPING - BACK TO TRADITIONAL APPROACHES , ETC. ETC. YOU HAVE TO BE IN THE CLASSROOM WITH THE PRESENT GENERATION OF STUDENTS WEANED ON TV , DRUGS , VIOLENCE AND SEX TO GET A FEEL FOR WHAT IS ACTUALLY NEEDED. I'M NOT TALKING HERE ABOUT THE TOP 10 OR 20 % ; THE FUTURE DESIGNERS AND LEADERS . I'M TALKING ABOUT ^{GETTING} THE VAST MAJORITY OF STUDENTS ACROSS THE SOCIOECONOMIC AND CULTURAL GAMUT TO ENJOY LEARNING , PARTICULARLY MATH AND SCIENCE , AND BUILD AN INTRINSIC WORK ETHIC IN THESE YOUNG PEOPLE. THEY WILL EVENTUALLY SUPPORT THE GREAT ADVANCES IN SCIENCE AND TECHNOLOGY. THEY WILL BE THE TECHNICIANS , THE FANS IN THE STANDS WHO FINANCE OUR REACHES INTO OUTER AND INNER SPACE.

I HOPE TO GET GREAT LESSONS INTO THE CLASSROOMS .
THEY WILL COME FROM THE THOUSANDS OF SUPER TEACHERS ACROSS OUR NATION . AT PRESENT THERE IS NO WAY FOR TEACHERS TO GET THEIR FAVORITE LESSONS PRINTED , AND INTO CLASSROOMS.

I HAVE ENCLOSED, AS ONE FACET OF A "GET IT DONE" PROGRAM - THE DETAILED CONCEPTS OF GREAT LESSONS FROM TEACHERS ACROSS AMERICA. I HAVE ALSO ENCLOSED A SAMPLE LESSON , USING SCRATCH OFFS. I'M KIND OF

DESPARATELY REACHING OUT TO YOU TO HELP PROMULGATE THIS CONCEPT OF LESSON DEVELOPMENT AND DISTRIBUTION. PRINTED LESSONS CAN ACCOMPANY OUR OUTSTANDING VIDEO AND COMPUTER CAPABILITIES SO THAT STUDENTS HAVE A REAL INVOLVEMENT , OFTENTIMES WITH HANDS ON ACTIVITIES AND SO THAT WHEN THEY ARE FINISHED THEY WILL HAVE SOMETHING OF THEIR OWN TO TAKE HOME.

OUR GOVERNMENT NEEDS TO LEAD THE WAY IN PARTNERSHIP WITH INDUSTRY TO PROVIDE THESE LESSONS AND TO EDUCATE TEACHERS AND SUBSTITUTES IN THEIR EFFECTIVE USE. WHY AM I WRITING A DYNAMIC SCIENTIST OF YOUR STATURE ? HOPING I SUPPOSE , THAT YOU MIGHT SEE THE OPPORTUNITY TO BRING MORE SCIENCE TO THE WIDE MAJORITY OF STUDENTS THAT WILL NEVER GET TO PSSC STYLE PHYSICS. HOPING YOU MIGHT SEE THIS AS ONE WAY FOR DEDICATED , CREATIVE TEACHERS TO BRING THEIR BEST LESSONS [MATERIALS COMPLETE] INTO THOUSANDS OF CLASSROOMS ACROSS OUR NATION. AND BEST OF ALL , TO BYPASS ALL THE BUREAUCRACY - IN THE BEST ROSS PEROT TRADITION OF ' LET'S GET IT DONE. THE GREAT LESSONS CONCEPT IS COST EFFECTIVE , FAIR EDUCATION AT ITS BEST. YOU TAKE SOME OF THE INEQUITIES OF RACE AND CIRCUMSTANCE OUT OF EDUCATION - WORKING TOWARD THE ACTUAL REALIZATION OF " AMERICA 2000 " - AND PERHAPS ESTABLISHING A FAIR BASING FOR NATIONAL STANDARDS TESTING.

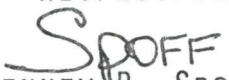
DOCTOR BROMLEY , IF YOU HAVE ANY IDEA HOW I CAN GET THIS GOING - I NEED YOUR HELP. AFTER 30 YEARS OF TEACHING I KNOW THIS IS AN EXCELLENT WAY TO GO , WHICH WILL BE POPULAR WITH MOST STUDENTS AND TEACHERS ALIKE , AND IN AN ECLECTIC SENSE IT IS A SOLAR FLARE , HAVING ITS PLACE IN THE SUN.

I MET YOU AT MY 35TH REUNION AT THE UNIVERSITY OF ROCHESTER THIS YEAR - YOU ARE A WONDERFUL SPEAKER INSPIRATIONAL , HUMAN AND HUMOROUS , TOUCHING REALITIES , WITH VISION AND CARING ABOUT PEOPLE AND THIS BEAUTIFUL BLUE PLANET. PERHAPS ONE OF YOUR PROTEGES , YOUR FORMER STUDENTS YOU TOLD ME ABOUT , COULD HELP ME IN MY ENDEAVOR TO BRING ENJOYABLE LESSONS TO ALL STUDENTS.

I SAW YOU IN PRESENCE AT THE NOT TOO WELL NATIONALLY PUBLICIZED WORLD SPACE CONGRESS , AND WAS LUCKY ENOUGH TO BE ON THE FLOOR OF THE SPACE EXPO TO CATCH YOUR VISIONARY AND ELOQUENT SPEECH THERE. I HAVE SENT MY LESSON SAMPLES TO NSF , TEXAS INSTRUMENTS AND THE NEW YORK STATE EDUCATION DEPT. I HAVEN'T EVEN RECIEVED AN ACKNOWLEDGEMENT OF RECEIPT. PLEASE GIVE ME THAT. PLEASE HELP ME AND LET'S REALLY IMPACT SCIENCE AND MATH EDUCATION BEFORE YOUR TENURE IN D.C. IS UP.

THANK YOU FOR YOUR INSPIRATION ,
AND GOD BLESS YOU

RESPECTFULLY,

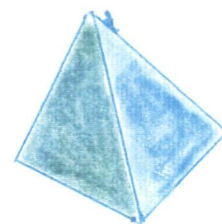

TENNEY R. SPOFFORD

P.S. PLEASE PARDON THE TYPING
BUT I WANTED TO GET THIS OUT TO YOU
AND THE SUBSTANCE OF MY MESSAGE IS HERE.

BRAIN BUILDERS

NAME: _____

PERIOD: _____

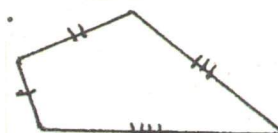


MATH 112

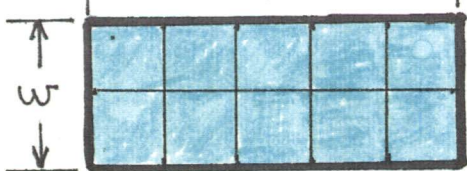
PERIMETER AREA VOLUME

INSTRUCTIONS: SCRATCH OFF BOX NEXT TO YOUR ANSWER TO SEE IF YOU ARE RIGHT.

1. A FOUR SIDED POLYGON IS CALLED A
- (1) TRIANGLE ☐
 - (2) QUADRILATERAL ☐
 - (3) PENTAGON ☐



"LITTLE MARKS SHOW SIDES ARE DIFFERENT IN LENGTH"

2. A FOUR SIDED POLYGON THAT LOOKS LIKE THIS  IS CALLED A

- (1) SQUARE ☐
- (2) TRAPEZOID ☐
- (3) RECTANGLE ☐

3. (A) ONE SIDE OF THE POLYGON ABOVE IS MARKED L ; THE L STANDS FOR

L

MEASURE IT WITH YOUR RULER TO THE NEAREST CENTIMETER

_____ CM. (SMALLEST SCALE)

- (B) FOR THE SIDE OF THE POLYGON MARKED W , THE W STANDS FOR

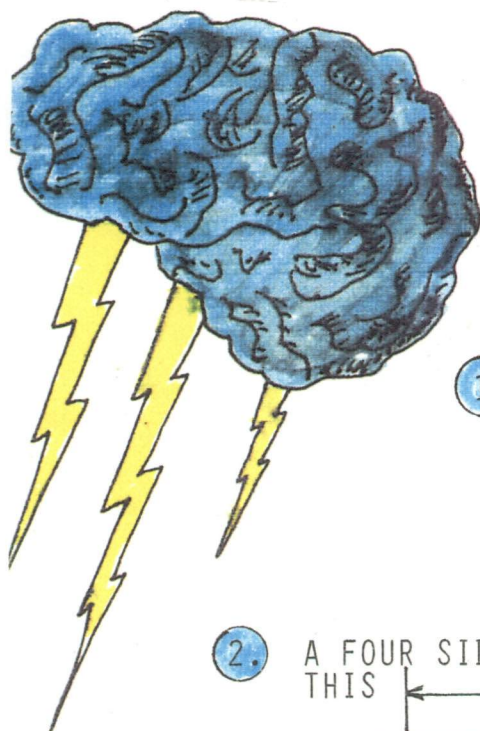
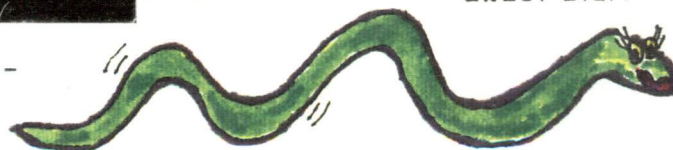
MEASURE W IN CENTIMETERS

_____ CM. - 1 -



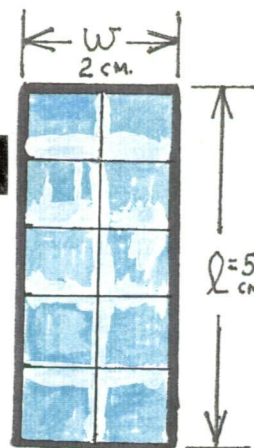
A
STANDING
QUADRA

"MOVE RIGHT ALONG SWEET STUFF"



4. THE DISTANCE AROUND A RECTANGLE IS CALLED

- (1) AREA [REDACTED] (2) CIRCUMFERENCE [REDACTED]
(3) PERIMETER [REDACTED]



USE MEASUREMENTS FROM PG. 1

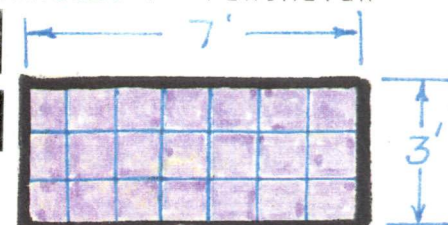
5. FIND THE P [REDACTED] OR DISTANCE

AROUND THE BLUE RECTANGLE.

- (1) 10 cm. [REDACTED] (3) 12 cm. [REDACTED]
(2) 7 cm. [REDACTED] (4) 14 cm. [REDACTED]

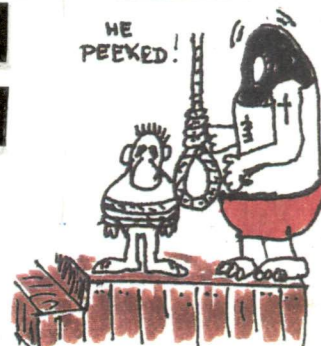
6. SELECT A FORMULA FOR THE DISTANCE AROUND A RECTANGLE. P = PERIMETER

- (1) $P = 2l + 2w$ [REDACTED] (3) $P = l + w$ [REDACTED]
(2) $P = 2lw$ [REDACTED] (4) $P = lw$ [REDACTED]



7. FIND THE AREA OF THE RECTANGLE SHOWN
(IF NECESSARY COUNT THE BOXES INSIDE)

- (1) 10 ft^2 [REDACTED] (3) 20 ft^2 [REDACTED]
(2) 21 ft^2 [REDACTED] (4) 18 ft^2 [REDACTED]



8. ANOTHER WORD FOR AREA WOULD BE

- (1) PERIMETER [REDACTED]
(2) SURFACE [REDACTED]
(3) VOLUME [REDACTED]

9. SELECT THE FORMULA FOR THE AREA OF A RECTANGLE

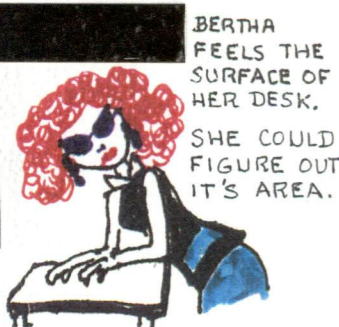
A = AREA

- (1) $A = l + w$ [REDACTED] (3) $A = 2l + 2w$ [REDACTED]
(2) $A = 2lw$ [REDACTED] (4) $A = lw$ [REDACTED]

10. IF YOU HAD A RECTANGLE LIKE THIS, WHAT WOULD BE THE FORMULA FOR

- (A) AREA (B) PERIMETER

- (1) $A = bh$ [REDACTED] (1) $P = bh$ [REDACTED]
(2) $A = 2b + 2h$ [REDACTED] (2) $P = 2b + 2h$ [REDACTED]



11. IN THE RED RECTANGLE
(A) THE b WOULD STAND FOR (1) BRITISH [REDACTED]

(2) BOTTOM [REDACTED]

(3) BASE [REDACTED]



A CLUCK

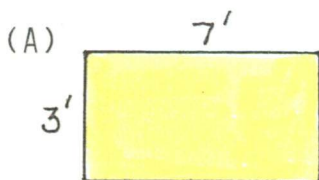
(B) THE h IN THE RED RECTANGLE STANDS FOR

(1) HEIGHT

(2) HELP

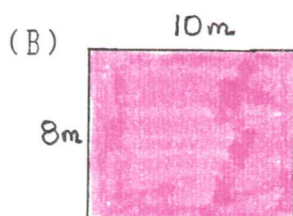
b

12. FIND THE AREA A , AND THE PERIMETER P FOR EACH RECTANGLE SHOWN



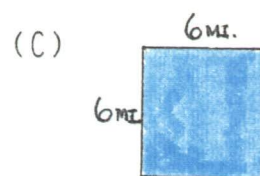
$A = \underline{\hspace{2cm}} \text{ FT}^2$

$P = \underline{\hspace{2cm}} \text{ FT.}$



$A = \underline{\hspace{2cm}} \text{ M}^2$

$P = \underline{\hspace{2cm}} \text{ M}$



$A = \underline{\hspace{2cm}} \text{ MI}^2$

$P = \underline{\hspace{2cm}} \text{ MI}$

13. THE LAST QUADRILATERAL SHOWN, THE BLUE RECTANGLE WHICH HAS ALL FOUR SIDES EQUAL, IS KNOWN AS A

(1) BOX

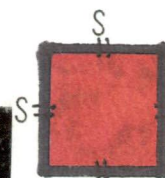
(3) SQUARE

14. A FORMULA FOR THE AREA OF THE RED SQUARE OF SIDE S IS

(1) $A = S^2$

(2) $A = 2S$

(3) $A = 4S$



15. THE FORMULA FOR THE PERIMETER OF A SQUARE WITH EACH SIDE CALLED S IS

(1) $P = S^4$

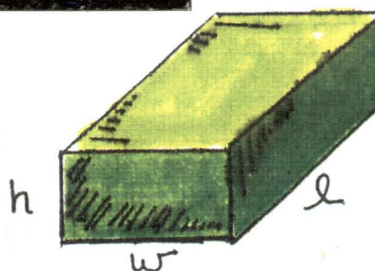
(2) $P = 2S$

(3) $P = 4S$

16. TO FIND THE VOLUME V OF A BOX OR WHAT IS CALLED A RECTANGULAR SOLID, YOU WOULD USE THE FORMULA

(1) $V = l + w + h$

(2) $V = lwh$



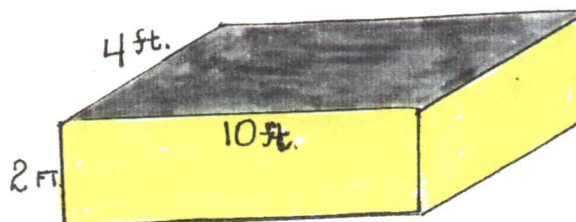
17. WHAT IS THE VOLUME OF THE RECTANGULAR SOLID SHOWN?

(1) 80 CUBIC FT.

(2) 136 FT^3

(3) 16 CUBIC FT.

(4) 32 FT.^3

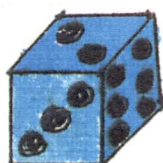


TO MEASURE AN AIR HEAD YOU NEED VOLUME.

18.

RECTANGULAR SOLIDS , LIKE DICE , HAVE HOW MANY SIDES ?

(1) 6



(3) 3



(2) 2



(4) 4



19.

WHEN YOU FIND THE VOLUME YOU ARE MAKING A MEASUREMENT OF

(1) SPACE



(3) SURFACE



(2) DISTANCE



(4) TIME



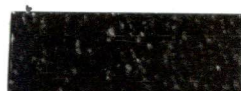
20.

IF YOU COVER A BOX WITH WRAPPING PAPER , HOW MANY SIDES WOULD YOU NEED TO COVER ?

(1) SIX



(3) THREE



(2) TWELVE



(4) FOUR



21.

COVERING A BOX WOULD INVOLVE FINDING ITS

(1) PERIMETER



(2) SURFACE AREA



(3) VOLUME



22.

TO FIND OUT HOW MUCH SAND YOU WOULD NEED TO FILL UP A BOX (CARTON) , YOU WOULD NEED TO FIND THE

(1) PERIMETER



(3) VOLUME



(2) SURFACE AREA



(4) CIRCUMFERENCE



23.

COUNT THE NUMBER OF EDGES ON A RECTANGULAR SOLID. THE SIDES AND EDGES YOU CAN'T SEE ARE DOTTED. ALL THE EDGES OF THE SAME LENGTH HAVE THE SAME COLOR.

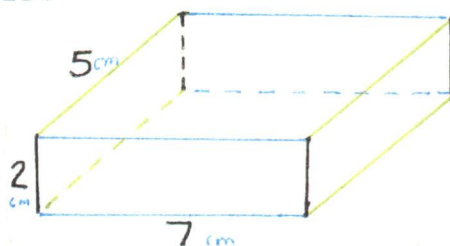
(1) SIX



(2) NINE



(3) TWELVE



SAY HELLO TO
DRUGS...
GOODBYE TO
FREEDOM!



24.

ADD UP THE LENGTHS OF ALL THE EDGES OF THE RECTANGULAR SOLID ABOVE.

(1) 14 cm.



(2) 28 cm.



(3) 70 cm.

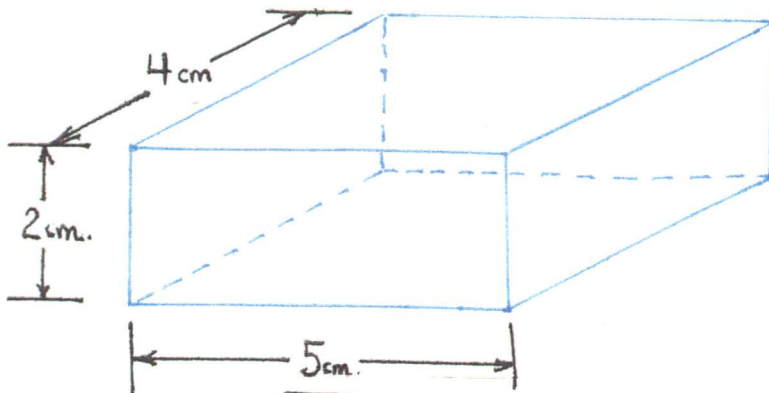


(4) 56 cm

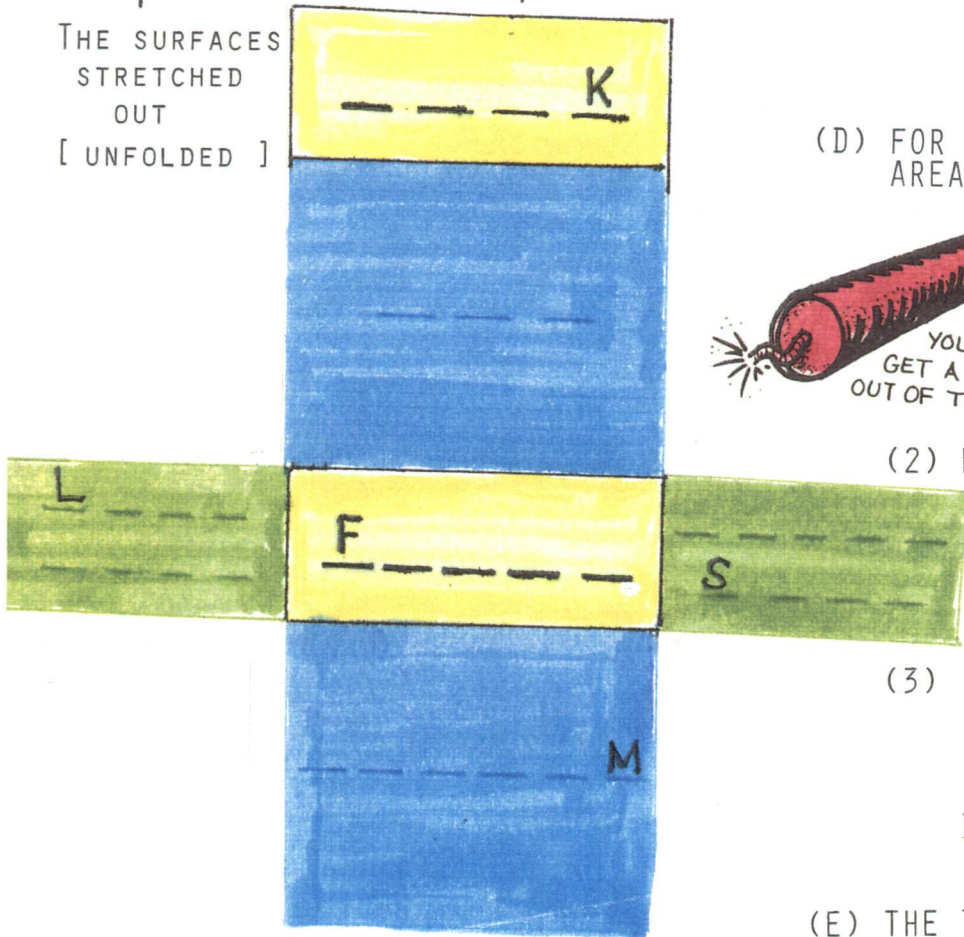


25.

TO FIND THE SURFACE AREA OF A RECTANGULAR SOLID YOU FIND THE AREA OF THE SIX SIDES. [REMEMBER THAT DOTTED LINES SHOW PARTS YOU COULD NOT SEE - UNLESS THE SOLID WAS MADE OF TRANSPARENT MATERIAL LIKE PLASTIC.]



THE SURFACES
STRETCHED
OUT
[UNFOLDED]



(A) YOU NEED THE FRONT AND THE

(B) THE BOTTOM AND THE

(C) THE LEFT SIDE AND

THE _____ SIDE

(D) FOR THE FIGURE SHOWN FIND EACH AREA:



(1) FRONT _____ cm^2

AND

BACK _____ cm^2

(2) LEFT SIDE _____ cm^2

AND

RIGHT SIDE _____ cm^2

(3) TOP _____ cm^2

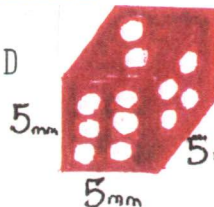
AND

BOTTOM _____ cm^2

(E) THE TOTAL SURFACE AREA IS

26.

TAKE A LOOK AT THIS RED



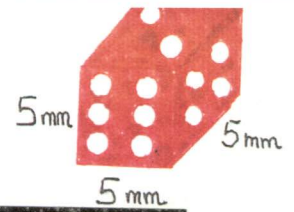
(F) FIND THE VOLUME

_____ cm^3

(A) ADD UP ALL THE EDGES _____ MM

THIS IS A MEASUREMENT OF LENGTH OR A LINEAR MEASURE. MEASUREMENTS OF LENGTH ARE ONE DIMENSIONAL OR 1 D

(B) CALCULATE THE TOTAL SURFACE AREA OF THE RED DIE [CUBE]



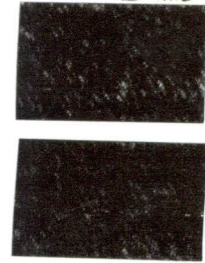
THE MEASURE OF SURFACE AREA IS TWO DIMENSIONAL [UNITS²] 2D

MM²

(C) FIND THE VOLUME OF THE CUBE

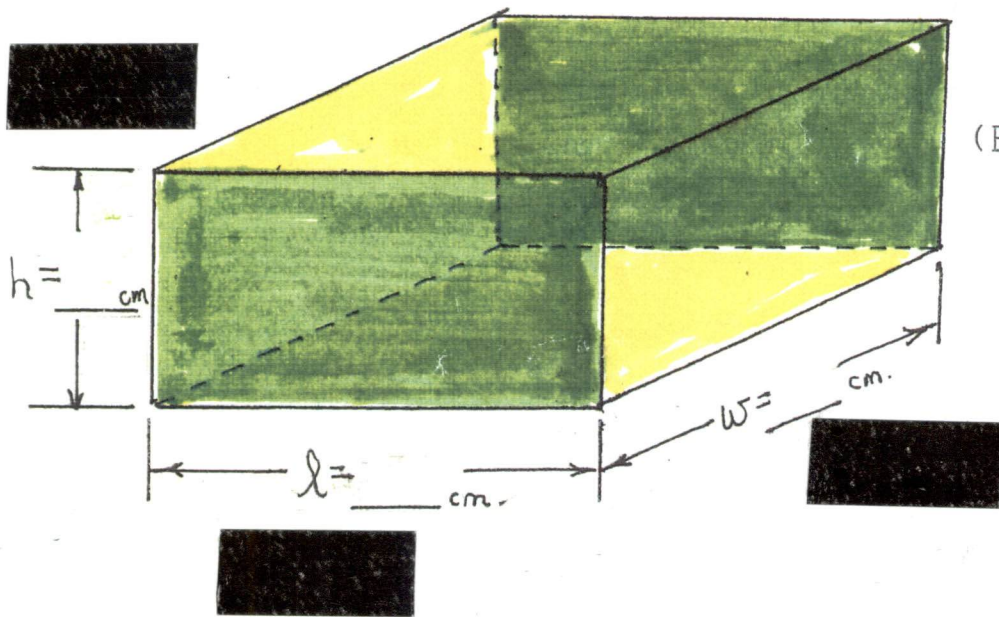
VOLUME IS A MEASURE OF SPACE IN THREE DIMENSIONS 3D

MM³



27

NOW MEASURE, TO THE NEAREST CENTIMETER, THE DIMENSIONS OF THE RECTANGULAR SOLID DRAWN BELOW. WRITE IN THE DIMENSIONS.



(A) FIND THE VOLUME _____ CM³



(B) SURFACE AREA

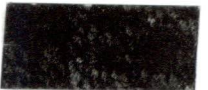
(1) TOP AND BOTTOM

_____ CM²



(2) FRONT AND BACK

_____ CM²



(3) RIGHT AND LEFT SIDES

_____ CM²



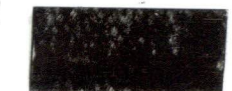
(C) SURFACE AREA HAS

(1) 1D

(2) 2D

(3) 3D

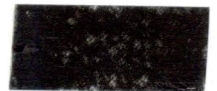
TOTAL _____ CM²



(D) DETERMINE THE SUM OF ALL THE EDGES

THE MEASUREMENT IN CM. INDICATES

_____ CM



(1) 1D

(2) 2D

(3) 3D



"HOW'S YOUR MAINFRAME?"
IT'S GREAT TO BE THE
CENTER OF ATTENTION.



USE YOUR RULER (INCH SCALE) TO SKETCH A RECTANGULAR SOLID

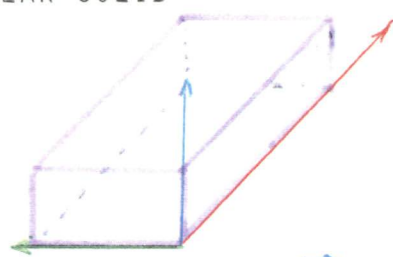


GO
FOR
IT

$$H = 1''$$

$$W = 2''$$

$$L = 3''$$



(A) GO ALONG BLUE $\overrightarrow{PA}$ TO MEASURE

$$H = 1''$$

(B) GO ALONG GREEN $\overrightarrow{PC}$ TO GET

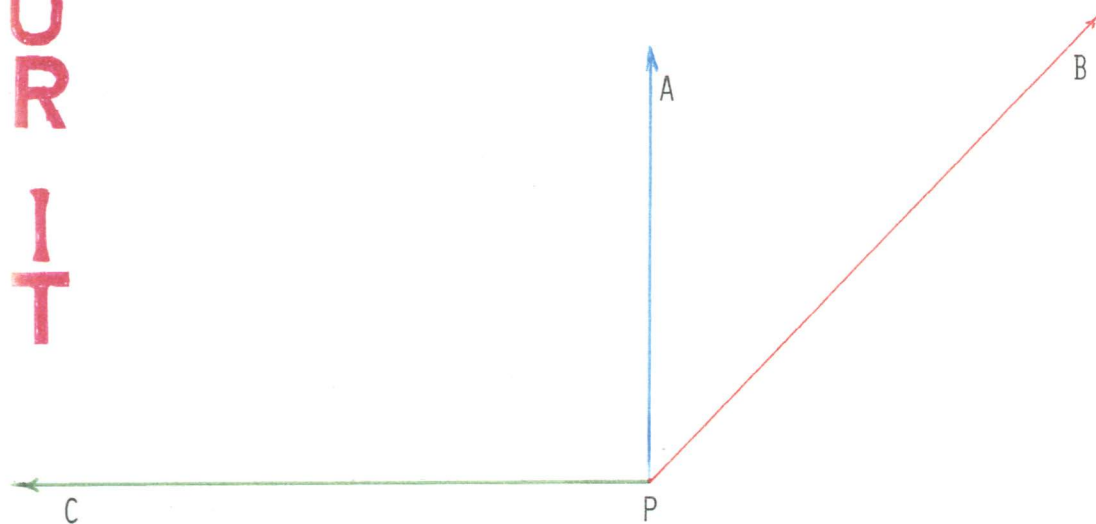
$$W = 2''$$

(C) FINALLY GO ACROSS RED $\overrightarrow{PB}$ FOR

$$L = 3''$$

(D) NOW SEE IF YOU CAN CAN COMPLETE DRAWING THE RECTANGULAR SOLID SO THAT IT LOOKS LIKE THE PURPLE ONE DRAWN ABOVE....

GO AHEAD ... GIVE IT A TRY!



(E) YOU DREW 3 EDGES TO START. HOW MANY MORE EDGES DO YOU NEED TO DRAW SO YOU CAN SEE THE VISIBLE SURFACE OF YOUR RECTANGULAR SOLID?

- (1) 5 ☐ (2) 6 ☐ (3) 3 ☐ (4) 9 ☐

(F) WHAT IS THE SUM OF ALL THE EDGES (VISIBLE AND INVISIBLE)

- (1) 6" ☐ (2) 12" ☐ (3) 24" ☐ (4) 48" ☐

(G) CALCULATE THE TOTAL SURFACE AREA

- (1) 11"² ☐ (2) 22"² ☐ (3) 24"² ☐ (4) 6"² ☐

(H) NOW GO 3D , FIND THE VOLUME.

- (1) 6"³ ☐ (2) 11"³ ☐ (3) 12"³ ☐ (4) 24"³ ☐

BEFORE YOU TURN TO TAKE YOUR QUIZ... GO BACK AND LOOK OVER THE LESSON!

ONCE YOU TURN YOU MAY NOT TURN BACK

QUIZ

NAME: _____

INSTRUCTIONS:

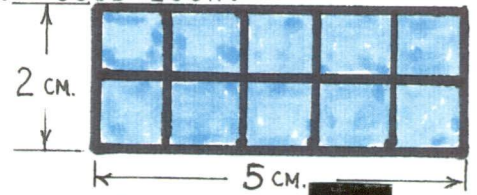
ONCE YOU START YOU MAY NOT LOOK BACK. THERE ARE 10 QUESTIONS WORTH 10 POINTS EACH.....PLUS THE FIRST BONUS FOR 5 POINTS AND A SECOND BONUS FOR 2 POINTS. UNCOVER ONLY ONE ANSWER! SCRATCH OFFS ON TWO CHOICES MEANS YOU GOT IT WRONG. GOOD LUCK.

COUNT
UP
YOUR
POINTS.

10

1. THE QUADRILATERAL SHOWN ON THE RIGHT IS A:

(1) TRIANGLE (2) TRAPEZOID (3) RECTANGLE



10

2. FIND THE DISTANCE AROUND THE QUADRILATERAL YOU JUST NAMED

(1) 10 cm. (2) 20 cm. (3) 14 cm.

10

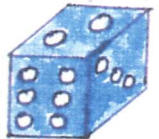
3. THE DISTANCE AROUND THE OUTSIDE OF A QUADRILATERAL IS CALLED ITS

(1) CIRCUMFERENCE (2) PERIMETER (3) DIAGONAL

10

4. HOW MANY SIDES DOES A DIE, LIKE THAT SHOWN HAVE ?

(1) 6 (2) 12 (3) 3



10

5. THE BLUE DICE IS A RECTANGULAR SOLID KNOWN AS A

(1) PYRAMID (2) CUBE (3) ZYPHOID

*NOTE: THE PLURAL OF DICE IS DIE!
OH NO! YOU'RE TOO YOUNG TO DIE!

10

6. WHEN YOU MEASURE AREA YOU ARE LOOKING FOR

(1) LENGTH (2) AMOUNT OF SURFACE (3) SPACE

10

7. PERIMETER IS A MEASURE OF

(1) LENGTH (2) SURFACE (3) SPACE

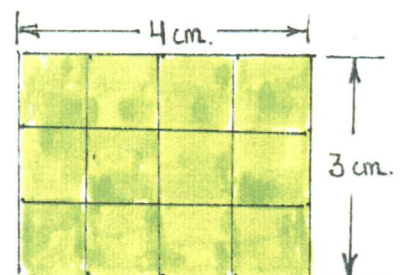


TURNING GREEN WITH ENVY

10

8. FIND THE AREA OF THE QUADRILATERAL SHOWN

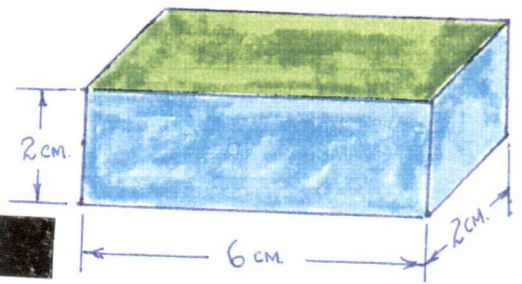
(1) 14 cm^2 (2) 7 cm^2 (3) 12 cm^2



10

9. CALCULATE THE VOLUME OF THE RECTANGULAR SOLID SHOWN.

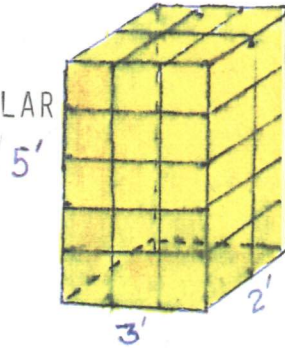
- (1) 24 cm^3 (2) 28 cm^3 (3) 48 cm^3 (4) 56 cm^3



10

10. FIND THE TOTAL SURFACE AREA OF THE YELLOW RECTANGULAR SOLID.

- (1) 31 ft^2 (2) 62 ft^2 (3) 30 ft^2 (4) 124 ft^2



Bonus

BONUS 5

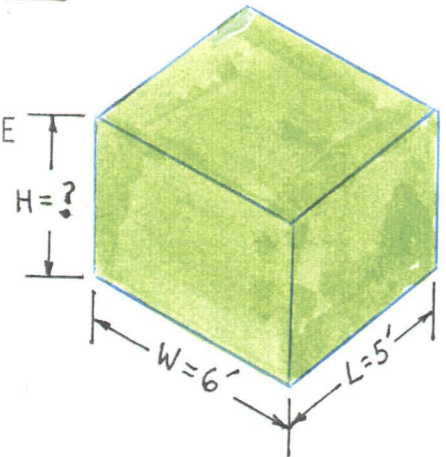
- XX. TWO SIDES OF A RECTANGULAR SOLID ARE GIVEN

$$W = 6 \text{ FT [WIDTH]}$$

$$L = 5 \text{ FT [LENGTH]}$$

AND THE VOLUME IS 120 ft^3 . FIND WHAT THE HEIGHT OF THE SOLID HAS TO BE.

- (1) 1FT (2) 2FT (3) 3FT (4) 4FT (5) 5FT

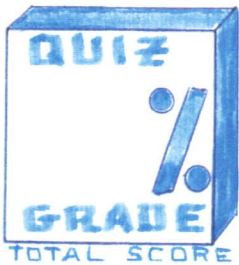


BONUS 2

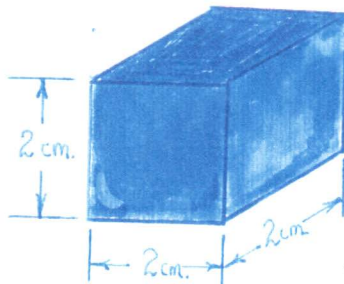
- XX. A CUBE HAS SIDES OF 2 CM. EACH AS SHOWN. IN ORDER FIND:

- A. SUM OF THE EDGES
B. SURFACE AREA
C. VOLUME

	<u>A</u>	<u>B</u>	<u>C</u>	
(1)	8 cm	6 cm ²	24 cm ³	
(2)	24 cm	24 cm ²	8 cm ³	
(3)	6 cm	8 cm ²	24 cm ³	
(4)	24 cm	8 cm ²	6 cm ³	
(5)	16 cm	12 cm ²	8 cm ³	
(6)	48 cm	24 cm ²	4 cm ³	



WELL BLOW ME DOWN!
THAT WASN'T
SO HARD!



GREAT LESSONS FROM TEACHERS ACROSS AMERICA

THE CONCEPT

Great Lessons will provide a powerful vehicle for any teacher or student group to produce a lesson for publication to be shared across America.

The lessons would employ the liberal use of non-toxic scratch offs , coded answers , and multi-variant approaches to provide immediate evaluative feedback to student responses.

These preprinted lessons would be sponsored by the government and private organizations with advertisements targeting segments of the student population or their parents. They could be used as an instructional commonality for a fair National Standards Testing program.

CONSIDERATIONS

- A time critical NOW concept to get more great lessons into the classrooms across America.
- Each lesson is materials complete ... NO ORDERING , NO STANDING IN COPY MACHINE LINES for teachers.
- Lessons , particularly when provided for substitutes , or inexperienced teachers can result in a 10% or more upgrade in academic achievement across the nation.

- Lesson handout material is motivating , captivating , and attractive to a wide cross section of students.
- In science and math each lesson will emphasize " hands on " work by students.
- Lessons can be done individually or with 2 or 3 students working together. (Cooperative learning)
- Abundant use of (non-toxic) scratch offs will provide instant feedback and reinforcement for student responses.
- Multiple choice scratch off quiz's following each lesson act as a review as well as an evaluative tool for teachers. The quiz's are student self corrected.
- Students proceed through the lessons at their own pace.
- Bonus questions challenge the brighter or more ambitious students.
- Lessons greatly enhance reading skills.
- Work habits are encouraged. (establishing a work ethic)
- Corporate sponsorship allows direct participation in the education/ training of youth ... the future work force.
- Group work on lessons help satisfy student socialization needs and stimulate leadership.

- Lessons strongly emphasize targeted learning objectives of the National Councils of Mathematics and Science Teachers. (NCTM,NSTA,NRC)
- Scratch offs can be combined with more traditional worksheets ... an eclectic approach.
- There are some days when even the best teachers can use a break in routine or they want to introduce new materials in a new way.
- Responses to answers selected by students can be instructive or personalized.
- Great Lessons will supplement , not compete with the progressive and educationally critical work being done by textbook companies.
- Most students like different approaches to learning - especially essential skills. The scratch off lesson provides just another way to do the job which is interesting and overcomes the boredom factor.
- The authoritative status of substitutes ,new teachers and teachers new to the subject will be upgraded as the lessons become more commonplace and students endure the 5 to 10 minute instruction period so they can get on with their lessons which they enjoy.
- The student will have something to take home to show mom and dad and/or complete for homework.

● Each lesson can be self teaching , fun - an educational tool for sick children who may be bedridden or institutionalized ... hopefully to take their minds off physical or emotional pain.

● Computer lessons or interactive CD Rom systems rarely go beyond keyed responses , and should be developed with companion printed material to include scratch offs.

● The teacher has the opportunity , which is often unfortunately necessary to attend to disciplinary or other administrative problems.

● For some science , math or technology lessons there will be "make and take" projects accompanied by developmental scratch off materials.

● Students can be given a token reward or award for active , constructive participation - typically a piece of gum or candy to be provided in the lesson package. (Sponsor donated)

● With the assistance of nutritionalists gum or candy rewards could be vitamin supplemented to enhance neurological processes. (Thiamin - vitamin B-1 and water soluble has been shown to provide up to a 40% increment in mental performance and to decrease hyperactivity which is a common problem in youngsters today.)

- Teachers active and retired , student groups , etc. can prepare and submit lessons. For each lesson used (hopefully a great lesson) , an honorarium would be paid.
- Artists could prepare and submit original sketches / cartoons. Each one used will receive an honorarium and go into a clip art file. [Never underestimate the power of a cartoon to open up instant rapport , even with college students. Most have watched and enjoyed hours of cartoons daily since the inception of their memories.]
- Teachers can use lessons for enrichment of brighter students or remedial work at the other end of the ability spectrum for slower students. (using selected level of difficulty)
- Lessons can be successfully completed in a disruptive classroom environment by motivated students.
- In the development stage , each lesson prototype will be pretested and with common sense limitations evolved into a dynamite - smooth flowing final edition for publication on Webb presses capable of doing scratch offs. Laminated scratch offs were developed for lesson prototypes.
- Provide a commonality of excellent instructional material to all schools as a FAIR basis for a national standards testing program.
- Just by observing scratch off patterns a teacher can tell if students are having difficulty with the concepts. Almost everyone, students included , like personal attention. There is no need for

the teacher to carry around an answer sheet.

- Many advertisements or other media efforts to influence teenage spending go unnoticed , unseen ,unread. Scratch off lessons most surely demand attention ,building long term product identification and potential product loyalty.

- The developed scratch offs have excellent opacity so answers cannot be read through or from behind.

- Again -do not underestimate young people , they appreciate good learning materials. The goal of Great lessons is to get kids hooked on the excitement of learning and the satisfaction of WORKING and knowing what they are doing.

- When printed in mass ,the price per copy is very reasonable.

- As always our youngsters are the hope and dream of the future. Their mission is to enjoy life and sustain or improve the ecosystem of the blue planet for the many billions to come , until the day we can colonize nearby star systems. The media has often lead them down the path of violence and destruction. Great lessons can subtly help turn this around , in part through cartoon messages.

- There will be no more need for substitute lesson plans. Chairpersons and lead teachers can hand out complete lessons with all materials needed.

Logged Out
12-01-92

"Document Control"

TYPE: ACTION
ORIGINATOR: 02

DOCUMENT NUMBER: 9203353
DIRECTORATE STATUS

STATUS I

FROM: EDMUND, Norman W.: EDMUND SCIENTIFIC COMPANY

TO: DR. D.A. BROMLEY

DATE OF
CORRESPONDENCE: 10/26/92

SUBJECT: HE IS FORWARDING TWO SETS OF BOOKS HE HAS RELEASED
ON SCIENCE TEACHING. HE ASKS THAT ONE SET BE
FORWARDED TO THE PRESIDENT.

DIRECTORATE
ASSIGNED: INTERNATIONAL/POLICY

STAFF
ASSIGNED: AIB

ACTION
REQUIRED: AS APPROPRIATE

STAFF
ACTION: as appropriate

SENDER'S DUE DATE:
OSTP DUE DATE: 11/16/92
DATE COMPLETED: STAFF DUE DATE 11/16/92
DATE COMPLETED/DEPT:

COPIES TO: D. Allan Bromley

WHITE HOUSE TRACKING #:

CONTACT PERSON:

REMARKS: ORIGINALS TO INTERNATIONAL.

PHONE:

EXT:



OSTP RECEIVED: 11/02/92
FILE: P-EDUCATION

DEPT RECEIVED:

CENTRAL FILES:

"Document Control"

TYPE: ACTION
ORIGINATOR: 02

DOCUMENT NUMBER: 9203353
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STAFF
ASSIGNED:

ACTION
REQUIRED: AS APPROPRIATE

STAFF
ACTION:

OSTP DUE DATE: 11/16/92
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PHONE:

EXT:

OSTP RECEIVED: 11/02/92
FILE: P-EDUCATION

DEPT RECEIVED:

CENTRAL FILES:

November 23, 1992

Dear Mr. Edmund:

Thank you for your letter of October 26, 1992 with which you sent a set of publications you have just released. I have been asked to reply.

The publications and your ideas for correlation with the whole curriculum are quite impressive. Communities across the United States are endeavoring to reform their education programs under the auspices of America 2000, the national education strategy. I am sure that many of these communities will be pleased to have your materials and ideas and that they will give them every consideration.

Again, thank you. Your contributions on behalf of education are greatly appreciated.

Sincerely yours,

A handwritten signature in dark ink, appearing to be 'A. Buccino' or similar, written in a cursive style.

**Alphonse Buccino
Education Advisor**

**Mr Norman W. Edmund
Retired Founder of Edmund Scientific Company
407 NE 3rd Avenue
Ft. Lauderdale, FL 33301-3233**

3353

Norman W. Edmund
Retired Founder of Edmund Scientific Company
Researching The General Pattern of The Scientific Method,
Problem Solving, Innovation, and Creativity

RECEIVED
OCT 27 2 41:03
DSTP
MAIL ROOM

October 26, 1992

Dr. Allan Bromley
White House Office of Science & Technology Policy
1600 Pennsylvania Avenue NW
Washington, DC 20500-0001

Dear Dr. Bromley:

Enclosed you will find a set of publications which I have just released. I am also enclosing a set for you to pass on to President Bush.

I hope you will find time to read these booklets, as I believe that they will have a major effect on how we teach science.

Sincerely,



Norman W. Edmund

encs

Norman W. Edmund

Retired Founder of Edmund Scientific Company
*Researching The General Pattern of The Scientific Method,
Problem Solving, Innovation, and Creativity*

CONTACT: Norman W. Edmund
Gail Schuster

FOR IMMEDIATE RELEASE
October 1992

The tragic situation about the
"greatest discovery of science."

A newsworthy situation so unusual
that it is of historical significance.

"It has often been said that the greatest discovery in science was the discovery of the scientific method of discovery." You can help everyone learn how to more efficiently originate, prevent, solve, and challenge problems by informing them about *THE GENERAL PATTERN OF THE SCIENTIFIC METHOD (SM-14)*.

Do you remember being taught about "The Scientific Method" in school? The amazing but unfortunate situation is that "The Scientific Method" became so embroiled in misunderstandings and controversies in the 1950's that, since then, it has only been taught in a very minor way (if at all).

This tragedy is compounded by the fact that "The Scientific Method", better called THE GENERAL PATTERN OF THE SCIENTIFIC METHOD (SM-14), is *not* just a method for scientists. It is really a general method suitable for all types of problems and decisions in business, publishing, industry, and all other domains, including one's personal life. It is the basic method through which knowledge is refined and extended in all fields.

Read the fascinating, complete story in the two complimentary review booklets enclosed. For liberal free use of the copyrighted material, see Page 47 of *Edmund's Idea & Research Report*.

Supplement #1 to the Idea Report has just been issued. For your free copy, send a self-addressed, 29¢ stamped envelope.

-OVER-

THE BIG PICTURE ON TEACHING SCIENCE AND TECHNOLOGY AND ITS CORRELATION WITH THE WHOLE CURRICULA

THE GENERAL PATTERN OF THE SCIENTIFIC METHOD (SM-14) is not just for scientists. It is a general problem-originating, -solving, and -challenging method by which we refine and extend knowledge in all domains. Therefore, the responsibilities for teaching it and teaching the skills needed to use it properly do not belong to only science teachers and science programs. WE MUST TEACH THE SUBJECTS LISTED BELOW ACROSS THE CURRICULA AND IN SPECIAL CLASSES.

Action that must be taken:

1. Standardize on and teach SM-14 or similar.
The greatest discovery in science should be properly utilized.
2. Standardize on methods & processes used under the ingredients of SM-14.
Present the ones that are used most often in an easy-to-use 8½x11 format and on computer disc.
3. Standardize on a flexible national program on teaching thinking skills for grades K-12.
Identify the most used skills on individual 8½x11 sheets and on computer disc.
Take other action, as suggested on Page 27 of Edmund's Idea & Research Report.
4. Teach innovation, change, and creativity—A BIG key to America's competitiveness.
Extend our movement of teaching creativity. Emphasize innovation separately.
5. Personal attributes must be taught—not just left to parents to teach.
Attributes include character traits, aptitudes, skills, values, attitudes, and other similar traits. Bring them all together under an attribute program.
6. Student portfolios—alternate assessment movement should use SM-14.
SM-14 can be the key to the success of this movement. It requires all literacies.

THE BIG PICTURE ON EDUCATION IN GENERAL

- Under our system, no one is in charge of "The Big Picture."
- No one knows what the big picture is, as it is so complex and not summarized.
- Reform report after report—they have not been summarized and analyzed.
- Restructure programs by the hundreds are underway, and largely uncoordinated.
- Coordination efforts that are underway are not summarized.
- The "Systematic" approach to school reform (Education Week, 9/9/92, Page 1) needs to be developed quickly. It is the approach to seeing the "Big Picture."

TYPE: INFORMATION

DOCUMENT NUMBER: 9203178

ORIGINATOR: 02

STATUS C

DIRECTORATE STATUS

FROM: REINHARDT, Robert: COULTERVILLE-GREELY ELEMENTARY SCHOOL

TO: DR. D.A. BROMLEY

DATE OF
CORRESPONDENCE: 10/19/92

SUBJECT: HE IS FORWARDING A COPY OF HIS CLASS PLAN DESIGNED
TO STIMULATE INTEREST IN SCIENCE THROUGH TEACHING
AVIATION SCIENCE.

DIRECTORATE
ASSIGNED:

STAFF
ASSIGNED:

ACTION
REQUIRED:

STAFF
ACTION:

SENDER'S DUE DATE:

OSTP DUE DATE:
DATE COMPLETED:

STAFF DUE DATE
DATE COMPLETED/DEPT:

COPIES TO: D. Allan Bromley
INTERNATIONAL/POLICY

WHITE HOUSE TRACKING #:

CONTACT PERSON:

PHONE:

EXT:

REMARKS:

OSTP RECEIVED: 10/19/92
FILE: P-EDUCATION

DEPT RECEIVED:

CENTRAL FILES:

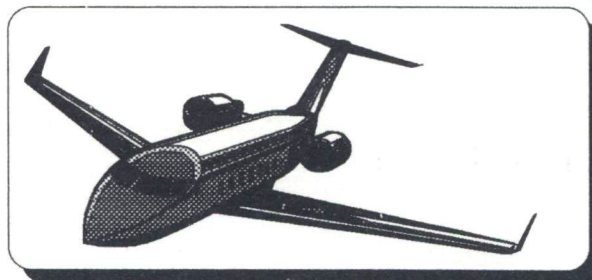
COULTERVILLE - GREELEY ELEMENTARY SCHOOL, K-8

10326 Fiske Road
Coulterville, CA 95311
(209) 878-3481



ROBERT REINHARDT
Principal

Dr. Allan Bromley, Ph.D.
Assistant to the President for Science &
Technology, Director, Executive Office of
Science & Technology Policy
New Executive Office Building
Washington, D.C. 20506



Dear Dr. Bromley,

I was impressed by your statements regarding math and science education at the elementary school level (Aviation Week, May 1992). As a former high school and college instructor, I strongly agree with your summation that "elementary schools are not providing the stimulation that attracts an interest in mathematics and science".

I have enclosed materials about our aviation program that is now in its third year of operation. I originally developed the program to serve "problem" Jr. High students at our school (our area "enjoys" the highest ex-felon population per capita in the state of California!). Starting out as a voluntary lunch time program, we have had about fifty-five 7th & 8th grade students **fly a real airplane** and **study** aviation as an "elective" course of study.

Last year we also began teaching aviation and aerospace units to 5th & 6th grade students. Their interest was so high that we will continue providing them with materials and instruction this year. The behavior and interests of our students has greatly improved as a result of their studies of aviation science and space technologies. Due to a high level of interest we have also created two computer labs with aircraft and Space Shuttle flight simulators (it is not uncommon to see students working with our computers long before and after school hours).

Due to inquires, I developed an educator's guide book to distribute to other schools and school districts. The booklet explains how to set up a similar program and addresses the benefits of teaching aviation science at the elementary grade level. I have enclosed a *photocopy* of my last real copy for you to keep.

On October 15th we will have our 2nd annual private air show at a local airport for grades 5-8 where our students will meet with WWII pilots, aircraft mechanics, retired aerospace engineers, and "home built" aircraft builders. On Saturday, October 17th we will give demonstrations of our IBM computer flight simulators, and provide information about aviation studies at another regional airshow.

I hope that your message about improving the excitement of learning science will be heard and integrated through the departments of Education, NASA, the Federal Aviation Administration and other federal departments that can have a great impact on methods of teaching and providing materials to elementary schools.

Sincerely,

"QUALITY CITIZENS THROUGH QUALITY EDUCATION"

AVIATION SCIENCE INSTRUCTION
FOR PUBLIC SCHOOLS

A PROGRAM OUTLINE FOR GRADES 7-12

*Dr. Bromley,
This is a photocopy of
our guidebook.
I hope you enjoy
reviewing it.
ER*

Robert Reinhardt
1992

Mariposa County Unified School District

Coulterville-Greeley School
10326 Fiske Road
Coulterville, California 95311
(209) 878-3481

INTRODUCTION TO AVIATION SCIENCE

Offering classes in the study of aviation science with flight instruction to students of Jr. and Sr. high schools provides an excellent opportunity to promote academic and behavioral development. Students of this age level (grades 7-12) are easily attracted to the study of aviation as it provides a focal point for the use of skills in reading, mathematics, physics, computers and other sciences.

Aviation remains an apex of engineering and technology that continues to provide global transportation and military defense. Countless occupational fields have developed to support the aviation industry that create billions of dollars of revenue annually. The study of aviation can provide students with an exciting stimulus that encourages academic development and can easily lead toward a vocational pursuit in a myriad of associated professions.

Most importantly, aviation science provides a challenging topic of study that shows a realistic and practical use of science and educational skills.

The following information provides an outline of aviation study that has been used with 7th and 8th grade students at the Coulterville-Greeley School in Mariposa County, California during 1990-92.

AVIATION INSTRUCTION

Aviation instruction can be offered to students as an extra-curricular or in class program of study. Students will volunteer to participate in an aviation class that is organized as a "club" during lunch hours, after school or on weekends. Meetings do not need to be longer than one hour per week.

INSTRUCTORS AND INSTRUCTIONAL PROGRAM

Almost any licensed pilot should be able to provide an effective course of instruction. If a certified teacher/pilot is not available on staff, look for a volunteer by contacting a local flight training center. If they cannot assist you, they will be able to provide you with the names of pilots to contact in your area. Most pilots will be eager to assist with the implementation of an instructional program.

The instructional program should include the study of established aviation science materials, aviation maps, computer programs and other materials that will help to develop a thorough understanding of the physics and concepts of aviation. Included in this outline is a suggested Outline of Instruction and a listing of affordable and free instructional resources.

FLYING COMPONENT

The intent of the aviation program is to include actual aircraft flight training. A relationship must be established with a local Federal Aviation Administration (F.A.A.) licensed flight school. [The Coulterville-Greeley students use aircraft at Columbia Airport which is a two hour round trip drive from the school.]

Flight school operators are in the business to provide aircraft flight instruction for a fee. The hourly cost depends upon the level of instruction, type of aircraft and regional inflation. Most operators use single engine aircraft like the Cessna 150, Piper Tomahawk or other economical aircraft. These airplanes are typically small two seat aircraft that cost about \$60.00 per hour which includes the certified flight instructor, airplane rental and all fuel.

By renting the aircraft for one hour, four students can receive fifteen minutes of individual flight time for approximately \$15.00 each.

To provide an incentive, students that do not maintain or improve their academic success and behavior should not be allowed to fly until progress is made in those areas (see appendix, Teacher Permission Form).

INSURANCE LIABILITY AND PERMISSION FORMS

All commercial aircraft operations are required to carry liability insurance. However, flight training schools are not required to carry liability coverage. Schools should only use flight training operations that carry liability insurance with a minimum of one million dollars per occurrence and one hundred thousand dollars per seat.

School District Insurance Carriers

Before beginning an aviation program that includes flying, contact your district insurance carrier and provide them with information about the proposed program, what flight school you will use, and copies of documents that will be issued to students (permission forms, etc.).

Permission Forms

A general permission form should request parental consent to transport a student to and from an airport and specifically notify parents that flying in an aircraft will occur (see appendix, Parent Permission form)

OUTLINE OF INSTRUCTION

The Coulterville-Greeley School program utilizes the Handbook of Aeronautical Knowledge as a main textbook. It is a Federal Aviation Administration publication that can legally be photocopied. It can be used to create excellent overhead transparencies of all illustrations. Students are provided with photocopies that cover weekly lessons and the copies are kept by the students in individual folders. This method provides every student with a free collection of materials at a pace that encourages concept comprehension. Many other free and inexpensive materials are used to enhance the instructional activities (see appendix, Instructional Resources).

INSTRUCTIONAL SEQUENCE

- 1). PARTS OF AN AIRPLANE
 - a). Wings, ailerons, flaps, elevator, etc.
 - b). Different types of airplanes (bi-plane, high wing, low wing, single engine, twin engine, military jets, commercial airliners, space shuttle, experimental).
- 2). PHYSICS OF FLIGHT
 - a). Lift, gravity, thrust, drag
 - b). Wing designs, Bernoulli's Principle, Newton's theories
 - c). Wing stalls, angle of attack

3). CONTROL FUNCTIONS

- a). Yoke, ailerons, elevators, rudder, flaps, trim tabs
- b). Axis of rotation (yaw, roll, pitch)
- c). Effects of torque (precession, slipstream, asymmetric propeller loading)

*ACTUAL FLIGHT TRAINING IN AN AIRCRAFT CAN BEGIN AT ANY TIME AFTER THE STUDY OF CONTROL FUNCTIONS

4). FLYING AN AIRPLANE

- a). Taxi and takeoffs
- b). Level flight, turns, descents (carburetor heat, flaps)
- c). Landings

5). BASIC INSTRUMENTS OF FLIGHT

- a). Altimeter (MSL, AGL, barometric pressure, density altitude)
- b). Vertical speed indicator
- c). Airspeed indicator (kinds of airspeed, color codings)
- d). Turn and slip indicator (types of turn needles, the ball, turn coordinator)
- e). Attitude indicator (artificial horizon)
- f). Magnetic compass (errors, deviation and lag)
- g). Heading indicator (gyroscopic compass)

6). PHYSICS OF STRUCTURAL LOADING

- a). Level flight, medium and steep bank turns, maneuvering speeds
- b). Components of lift, centrifugal force and weight

7). AIRCRAFT OPERATIONS MANUALS (use copies of Cessna 150, 152, 172 or other appropriate aircraft)

- a). Check lists
- b). Controls, flaps, engine instruments
- c). Loading
- d). Fuel, oil
- e). Lights, electrical system and breakers
- f). Emergency procedures

8). AIRPORTS AND RUNWAYS

- a). Runway markings, taxiways, holding lines
- b). Wind socks, pattern indicators, control towers, control zones
- c). Traffic patterns (up wind, cross wind, down wind, base, final)

9). RADIO COMMUNICATIONS

- a). Using a microphone and head set
- b). Radio frequencies
- c). Flight service centers, Automatic Terminal Information Service (ATIS)

- d). Communications Procedures: aircraft to aircraft, aircraft to control towers, phonetic alphabet (see Instructional Resources section: Basic Communication Procedures)
- 10). NAVIGATION AND RADAR TRACKING SYSTEMS
 - a). Transponders, lorans and ground positioning systems (GPS)
 - b). Maps and flight planning
 - c). Compass headings and in flight navigation (see Instructional Resources: FAA computer programs, Navigation and Flight)
 - d). Latitude, longitude, magnetic variations, ground speed, wind speed and direction
 - e). VHF Omnidirectional Range (VOR) and Automatic Direction Finder (ADF)
- 11). AIRPLANE PERFORMANCE
 - a). Weight and balance
 - b). Performance charts
- 12). RECIPROCATING AIRCRAFT ENGINES
 - a). Main parts of an engine (cylinders, pistons, intake/exhaust valves, crankshaft, carburetor)
 - b). Ignition system (magnetos, spark plugs, starter)
 - c). Four stroke system (intake, compression, power, exhaust)
 - d). Mixture control
 - e). Carburetor icing (causes and effects)
 - f). Fuel injected systems
- 13). WEATHER
 - a). Effects on flight (wind, temperature, precipitation)
 - b). Changes in atmospheric density
 - c). Causes of atmospheric circulation, wind patterns (high and low pressure), convection, wind shear, turbulence
 - d). Clouds (cumulus, altocumulus, cirrocumulus, lenticular)
 - e). Weather terminology (ceilings, fronts, visibility, etc.)
 - f). Weather maps, forecasts, satellite imaging
- 14). AVIATION SAFETY INFORMATION
 - a). Safe flight operations, wake turbulence and collision avoidance
 - b). Medical considerations (health, hypoxia, sinus block, carbon monoxide, vertigo)
 - c). Survival planning (ELT, radio frequencies, survival gear)
- 15). FEDERAL AVIATION REGULATIONS AND CAREER OPPORTUNITIES
 - a). F.A.A. regulations regarding licenses and types of pilot ratings (private, commercial, etc.)
 - b). Careers in aviation (pilot, mechanic, commercial operations, military and civil service)
 - c). Information regarding flight schools and scholarships

INSTRUCTIONAL RESOURCES

A collection of instructional resources will provide a variety of media to develop an understanding of aviation science and flight instruction. The following suggested materials and resources can be acquired for free or at a nominal cost (see appendix for detailed information)

- 1). Full size airplane instrument panel poster
- 2). General Aviation Booklet, Learning To Fly (free)
- 3). Pilot's Handbook of Aeronautical Knowledge (F.A.A.)
- 4). Video tapes (free loan programs and tapes to purchase)
- 5). Audio cassette tapes (airport communications, etc.)
- 6). Slide collections (pictures of aircraft)
- 7). Overhead transparencies (made from the Pilot's Handbook)
- 8). Computer programs for IBM and Apple computers. A free collection of Apple computer programs are available from the F.A.A. (Navigation, Principles of Flight)

SUGGESTED FIELD TRIPS

Field trips to local or regional aviation support centers will provide excellent opportunities to broaden student understanding of the aviation industry.

- 1). Visit local airports to see aircraft, control towers, runways and maintenance facilities.
- 2). Visit local military bases to see aircraft, control towers, radar tracking systems, satellite weather stations and to develop an understanding of vocational positions available in the military. Extensive field trips can often be arranged that will allow over night lodging and access to a large variety of aircraft and aerospace technology.
- 3). Visit large commercial airports to see control towers, airline maintenance facilities, baggage and ticketing operations.
- 4). Visit the Ames Research Center (San Jose, California) to see the world's largest wind tunnel, aviation research and design facilities, simulator systems and experimental aircraft. NASA research centers are located in several different regional areas of the United States.
- 5). Develop contacts with local aviation enthusiasts to gain access to private hangars and aircraft projects. Private aviation associations and clubs can be found in most communities that are located near an airport. Most groups will eagerly support aviation education and be able to provide expert speakers and additional instructional materials (engine and aircraft parts).

CONTINUING EDUCATION

- 1). Students over sixteen years of age can continue flight training as a solo pilot and log hours towards earning a private pilot license. Advanced high school aged students may be interested in completing a course of study that will prepare them to take the F.A.A. written examination. Several training companies sell video and text book courses. The KING COMPANY video courses are widely used (see Sources of Information).
- 2). Flight training schools can be found in almost every state that provide intensified training for Private Pilot, Commercial Pilot, CFI I & II, Multi-engine, Floats, and Airline Transport Pilot licenses.
- 3). Some state colleges and private schools offer a variety of degree programs in aviation and aerospace technologies that include aircraft flight instruction.
- 4). Many regional community colleges and trade schools offer programs to earn aircraft mechanics' licenses.
- 5). All branches of the military offer training and occupational fields involved with aviation and aerospace technologies. The United States Government (F.A.A., N.T.S.B., and other civil service agencies) employs and trains people to perform airtraffic and other aviation related services.

SOURCES OF INFORMATION AND INSTRUCTIONAL MATERIALS

Free video tape library, free Apple II computer programs and other information: Ames Research Center, National Aeronautics and Space Administration, Educational Programs Office, Moffit Field, California 94035 (415) 604-3939

Slides, video tapes and film strips: NASA CORE, 15181 Route 58 South, Oberlin, OHIO 44074 (216) 774-1051 ext. 293

Free booklets, posters and other curriculum materials for aviation and space studies: USAF-CAP-PLR, Aerospace Education, Mather AFB, California 95655

Free booklets and learning materials from the Federal Aviation Administration, Aviation Education, Programs and Materials (booklet APA-156) Barbara Abels, AWP-5, Freed O'Donnell, P.O. Box 92007, Worldway Postal Center, Los Angeles, California 90009

CALTRANS (State of California) free maps, instructional materials and excellent booklets (916) 322-9942

Instructional books and materials to purchase: Sporty's Pilot Shop, call (800) 543-8633 for a catalog.

KING COMPANY video courses for F.A.A. examination preparation. King Schools, 3840 Calle Fortunada PP4, San Diego, California 92123 (619) 541-2200

Magazine: Plane & Pilot, subscription is \$16.95 or a fee of \$21.50 will provide membership in the Pilots International Association which allows free access to a video tape library and other instructional materials (612) 588-5176.

APPENDIX

- 1). Parent information letter
- 2). Parent permission form
- 3). Teacher permission form
- 4). General Aviation booklet Learning to Fly
- 5). Basic ATC Communications Procedures, AOPA
- 6). Sporty's Pilot Shop (books, posters and other materials)
- 7). Plane & Pilot magazine, Pilots International Association
- 8). IBM program: Microsoft Flight Simulator, Microsoft
- 9). Apple program: Flight Simulator II, Sub Logic
- 10). Apple program: Chuck Yeager's Flight Trainer, Electronic Arts Inc.
- 11). Newspaper articles



AERO CLUB

ROBERT REINHARDT, PRINCIPAL
COULTERVILLE-GREELEY SCHOOL
10326 Fiske Road
Coulterville, California 95311
Phone: 209-878-3481

Dear Parents:

An aviation science class will be offered to all 8th grade students this year. The class will be held once a week and participation in the class (club) is voluntary.

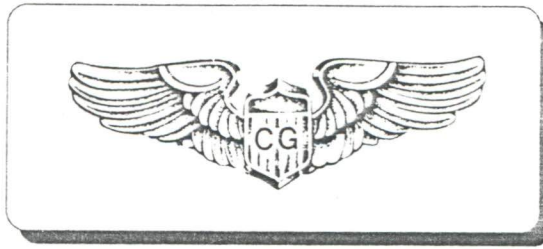
The class is offered as an incentive to improve the academic and social skills of our students. There is a high degree of physics, mathematics, reading and memorization involved in the study of aviation science that may help to improve your child's knowledge and study skills. The class will include study of the Federal Aviation Administration's Pilots Handbook of Aeronautical Knowledge, maps, compass skills, aircraft instruments and other elements of aviation.

Arrangements have been made with the Columbia Aviation Flight School to provide an actual aircraft flying experience in a Cessna 150 airplane with a certified flight instructor. With your permission, your child will have the opportunity to fly in an airplane. The cost of flying will be approximately \$16.50 per flight and permission slips will be sent home before each flight.

If you have any questions, please call me at the above number.

Sincerely,

Robert Reinhardt, Principal



AERO CLUB

COULTERVILLE-GREELEY SCHOOL

ON _____ WE WILL BE TRAVELING TO PINE MOUNTAIN LAKE AIRPORT. YOUR CHILD WILL **FLY IN A CESSNA AIRCRAFT** FROM COLUMBIA FLIGHT SCHOOL WITH A CERTIFIED FLIGHT INSTRUCTOR

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THE BEARER OF THIS NOTE HAS PERMISSION TO AUTHORIZE ANY EMERGENCY MEDICAL TREATMENT NECESSARY ON THIS TRIP.

LIABILITY INSURANCE IS MAINTAINED BY THE COLUMBIA FLIGHT SCHOOL.
{Parents and guardians agree to hold Mariposa County Unified School District, its agents & employees harmless from any liability which may be incurred unless specified by law.}

(Parent or guardian)

SCHOOL PRE-FLIGHT FORM
(sample design)

Date _____

Student name _____

This student has shown an acceptable level of performance in the following core classes:

	Please Circle		Teacher's Signature
English	Yes	No	_____
Math	Yes	No	_____
Science	Yes	No	_____
History	Yes	No	_____

[Three or more Yes responses are required for flying.]

This student has not been a behavioral problem and should be allowed to participate in an aircraft flying experience.

Teacher and or Principal



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Federal Aviation Regulations

Student Pilot Regulations

- Must be 16 years of age to solo.
- Must have passed a Class III medical examination given by a designated FAA physician.
- Can only fly with an instructor, or solo with instructor's written approval.

Private Pilot Regulations

- Must be 17 years of age.
- Must meet required minimum flight and ground school hours — usually 35–40, depending on the FAR.
- Must pass FAA Private Pilot's written examination (60 multiple-choice questions).
- Must pass a checkride with an FAA Examiner.
- May share expenses with passengers.
- Can fly only during Visual Flight Rule conditions (only during good weather).
- Must maintain Class III medical.

Instrument Rating Regulations

- Total of 125 hours of flying experience.
- Total of 40 hours Instrument Training.
- Must pass FAA Instrument Rating written examination.
- Must pass a checkride with an FAA Examiner.
- Can fly when weather conditions are below Visual Flight Rule minimums.

Commercial Pilot Regulations

- Must be 18 years of age.
- Must have an Instrument Rating.
- Total of 250 hours of flying experience.
- Must pass FAA Commercial Training written examination.
- Must pass a checkride with an FAA Examiner.
- Must have passed a Class II medical examination.
- Can "fly for hire."

Multi-Engine Rating Regulations

- Must have Private Pilot's License.
- Must take instruction with an appropriately licensed instructor.
- Must pass a checkride with an FAA Examiner.

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Special Thanks To: Bellanca Citabria; Bill Barley Photography; Cessna Aircraft Company; Eagle Aviation; Gulfstream Aerospace Corporation; and Piper Aircraft Corporation.

This is a 12 page color booklet that includes excellent illustrations.
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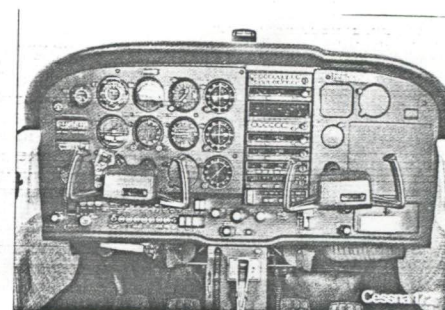


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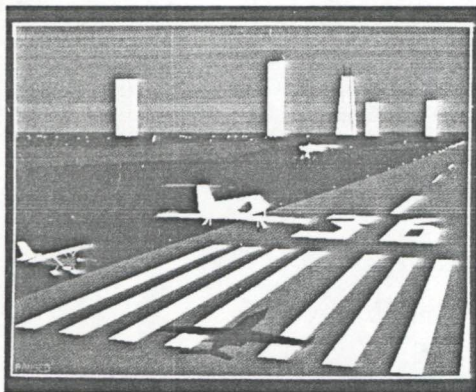
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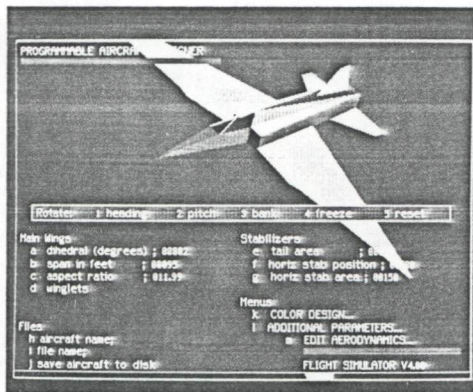
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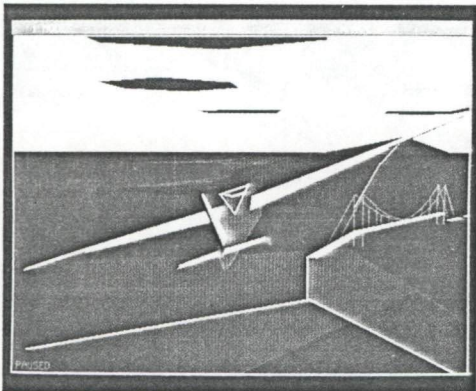
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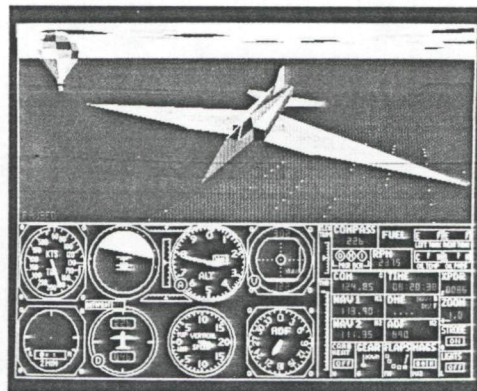


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Flight Simulator was designed for Microsoft by Bruce A. Artwick of the Bruce Artwick Organization, Ltd.



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Version 4.0
0789 Part No. 07301

System Requirements

- 384K memory
- One 3½-inch-disk drive
- MS-DOS® or PC-DOS operating system version 2.0 or higher
- CGA, MCGA, EGA (EGA requires 256K display memory), VGA, or Hercules® graphics adapter (monochrome or InColor)
- Appropriate monitor for the graphics adapter

Note:

Flight Simulator is not compatible with Terminate and Stay Resident (TSR) software.

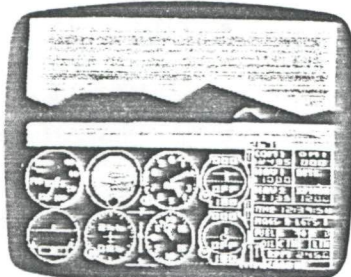
Options

- Microsoft Mouse
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Note:

The optional joystick or control yoke requires an IBM-compatible game card.

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ED LERNER played his first war game in the second grade and has been playing games ever since. His previous game development includes everything from an Arabian Nights fantasy adventure to a 3D game of *Deep Space*. He was bitten by the simulator bug several years ago, and turned his programming talent to developing this next-generation simulation experience.

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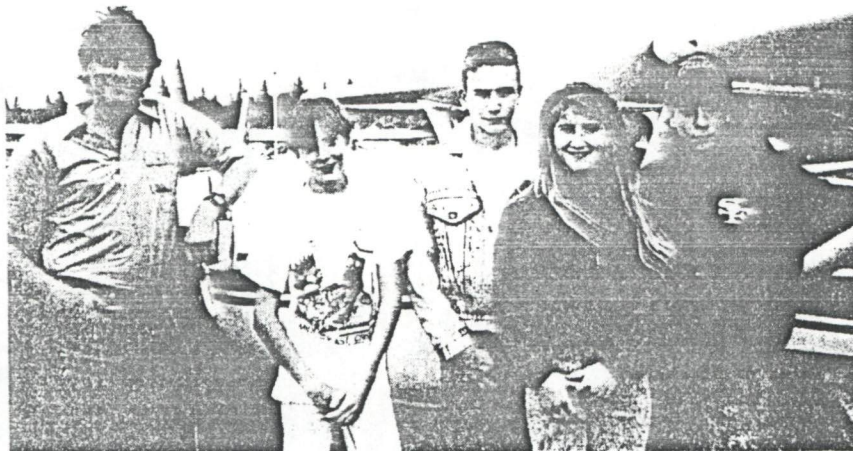
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STANDING IN FRONT of a Cessna 150 airplane are (from left) Columbia Aviation owner Steve Fairchild and Coulterville Greeley School students Brandon Reddick, Bret Haines, Melissa Dexter and Josh Bowen.

Sky's the limit for flying club

Four students from the Coulterville Greeley Elementary School Aero Club recently got a chance to operate the controls of a Cessna 150 airplane — the hands-on part of their aviation science class.

Taking to the skies were seventh-graders Melissa Dexter and Josh Bowen and eighth-graders Brandon Reddick and Bret Haines. They flew in the plane with Columbia Aviation owner and certified flight instructor Steve Fairchild.

"I've wanted to fly since I was a little kid," said Brandon after flight.

Josh added that "the ailerons and rudder work just like we studied."

Aviation science, a non-credit class, is offered during lunch hour once a week. It is taught by Principal Rob Reinhardt, who is a certified pilot.

"There is a high degree of physics, mathematics, reading and memorization involved in the study of aviation science that helps to improve the

knowledge and study skills of students," Reinhardt said.

"Most kids will work very hard to improve their grades and behaviour to fly an airplane."

Reinhardt said such a class is important because it shows a

real use of mathematics and other academic skills.

"Unfortunately most standard curriculum materials are pretty unfocused and boring for the typical teenager," he said.



Photos courtesy of Rob Reinhardt, Coulterville Greeley School principal
READY FOR FLIGHT is Josh Bowen, a seventh-grader at Coulterville Greeley Elementary School.

School Happenings

C-G School Aero Club

Last week eight more members of the Coulter-Greeley School Aero Club took to the skies over Columbia.

Operating the controls of a Cessna 150

with flight instructor Steve Fairchild, most of the students experienced flying for the very first time. Principal Rob Reinhardt teaches an aviation science class during lunch once a week for 7th and 8th grade students.

"My Aero Club students give up their lunch period to study the physics of flight, navigation, weather systems, instruments and other elements of aviation. There is a high degree of practical mathematics, reading and memorization involved in

the study of aviation science that helps to improve the knowledge and study skills of these students. I offer the class as a high interest incentive to help improve academic and social skills of the upper grade students at our school. These kids work towards the goal of actually flying an airplane which is a pretty exciting event," said Mr. Reinhardt.

Steve Fairchild is the new owner of Columbia Aviation and a certified flight instructor. "He earned his private pilot license while in his early teens and does a great job of teaching students how to fly," said Mr. Reinhardt, who earned his pilot license in Alaska.



Photo by Rob Reinhardt

Bret Haines enjoyed flying the Cessna 150 but also liked trying a 65hp. Talyorcraft on for size.

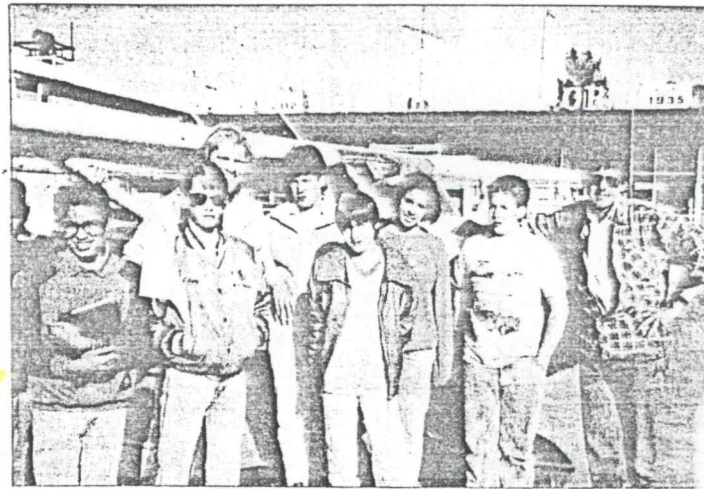


Photo by Rob Reinhardt

I. to r. Jacoby Hickerson, Casey Hertsog, Robert Hartsog, John Nichols, Brandon Reddick, Brandt Konrath, Sean McCulloch, and Steve Fairchild (Owner & Flight Instructor, Columbia Aviation).

If you are interested in learning how to fly, call Columbia Aviation at 533-1900.

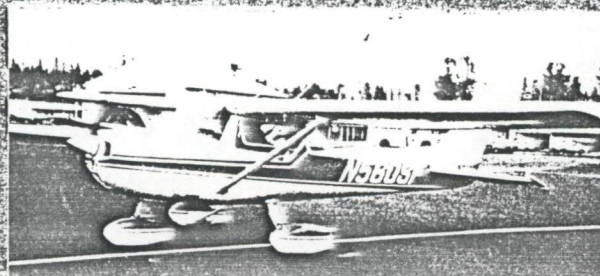


Photo by Rob Reinhardt

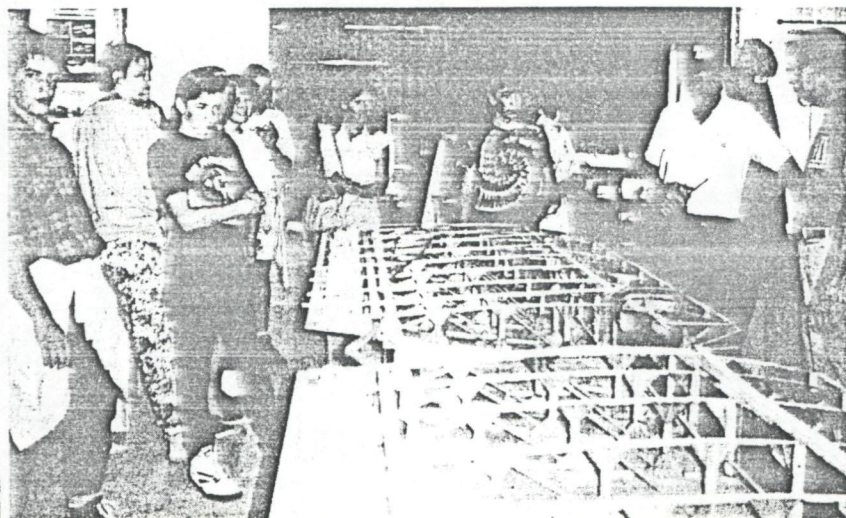
"This was my second flight and I can't wait to go again," said Brandon Reddick.



Melissa Dexter was the first aeroclub member to fly an airplane. "my mom wants to come fly with us next time!" she said.



Coulterville-Greeley aviation students visit Pine Mountain Lake Airport



The students learned about wing design from flight instructor Theron Balmain, John Lewis (former P-38 pilot, WWII) and aircraft builder Joe Frawley. Photo by Rob Reinhardt.



Mariposa County Aviation Students at Pine Mountain Lake Airport. Mr. Trentwells (former P-51 pilot, WWII), Mrs. Kay Smith (earned her pilot license at age 62), Mr. Henderson and a group of student pilots with a 1946 Navion airplane. Photo by Rob Reinhardt.

Aircraft owners at Pine Mountain Lake Airport greeted aviation students from Greeley Hill last week. Hugh Smith and many of his neighbors opened up their hangars and airplanes for the group to tour during the State Aviation and Aerospace Week.

Meeting the group were several World War II aviators and other pilots that acted as tour guides. The students were allowed to sit in many of the airplanes and taught some of the skills that older pilots have learned through the years.

"There is an enormous amount of aviation talent in his region," said Principal and Aviation Science teacher Rob Reinhardt. "We had World War II fighter pilots, aircraft builders, and other older pilots showing us bi-planes, ex-military, general aviation and experimental aircraft. It was a remarkable learning experience for our students," he said.

The aviation science class was started last year by the school principal as an elective study program for the Mariposa County School. Student interest in the study of



Pilot Harry Henderson shared some of his flying knowledge with Scott Cereghino and Brad Powers. Photo by Rob Reinhardt.

aviation has lead to a continuation of the program that includes actual aircraft flight instruction through an agreement with Columbia Aviation Flight School.

Coulter-Greeley students visit Castle

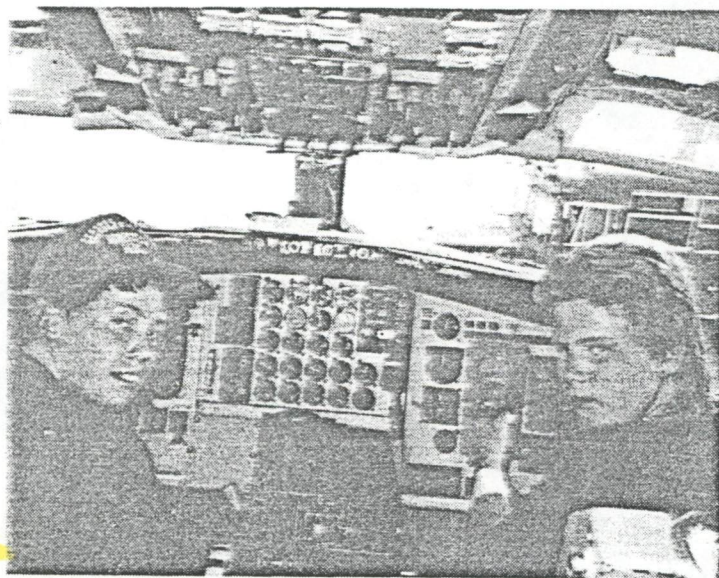


Coulterville-Greeley School "Aero Club" members and Capt Brand toured a B-52 that recently returned from action over Iraq. Photo by Rob Reinhardt.

Several members of the Coulter-Greeley School "Aero-Club" participated in a summer enrichment trip to Castle Air Force Base recently. The 7th and 8th grade students are members of an extra-curricular aviation program that includes actual in-flight aircraft instruction.

The students began an all day tour with a visit to the large static aircraft collection at Castle A.F.B. Museum to see many of the W.W. II bombers, Korean and Viet-Nam era jets.

Air Force Flight Instructor Capt. Gary Brand gave the group a private tour of a B-52 (recently returned from action in Iraq), a KC-135 Stratotanker, Base Ops, Weather, the Control Tower, and Instrumental Control Room.



Sean McCulloch and Ron Morgan compare the controls of a KC-135 Stratotanker to the Cessna 150 they have flown. Photo by Rob Reinhardt.

The students were allowed to see and gain an understanding of the technology and support services that make the U. S. Military

aviation systems the most advanced in the world. The students were very impressed by the professionalism and knowledge of

all the service people that made their visit a valuable learning experience.

MARIPOSA "Above the Fog" weekly Gaz And MINER



THE GAZETTE, YOUR WEEKLY LETTER FROM HOME - WHEN EVERYONE ELSE FORGETS TO WRITE.

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MARIPOSA, MARIPOSA COUNTY, CALIFORNIA

THURSDAY, MARCH 12



Retired aerospace engineer Mark Kelly and his wife Mary shared some memorabilia from Ames Research Center: Cross sections of old and new wind tunnel blades and a piece of 1/2 inch steel plate wind tunnel wall that was ripped open by part of a helicopter rotor blade in 1969. (also shown Chris Lane, Alisha Rodriguez, and Josh Bowen) Photo by Derrick Breton.

Aerospace engineer visits Coulter-Greeley School

By Derrick Breton

Mr. Mark Kelly and his wife Mary conducted slide show presentations about the Ames Research Center to 5th and 8th grade classes last week. The students are very interested in aviation and space technology. The fifth grade students have been studying space exploration and the eighth graders study aviation science weekly and take turns flying a Cessna 150 airplane from Pine Mountain Lake

Airport.

Kelly worked at Ames Research Center for 31 years and was involved with the testing of aircraft, helicopter and space vehicle designs. His presentations included historical photographs that showed changes to the wind tunnel testing facilities and aircraft that were tested.

Ames Research Center maintains the world's largest wind tunnel. It can test aerospace vehicles up to speeds of 300 knots per hour.

Following Kelly's presentations the eighth grade class showed him their IBM computer lab and Microsoft Flight Simulator programs. The software allows aerospace design and testing in a computerized graphical environment.

The students are now planning a field trip to visit the San Francisco International Airport control tower and the United Airlines maintenance facilities.

THURSDAY, JULY 2, 1992

MARIPOSA GAZETTE & MINER

Coulter-Greeley students visit Alameda Naval Air Station

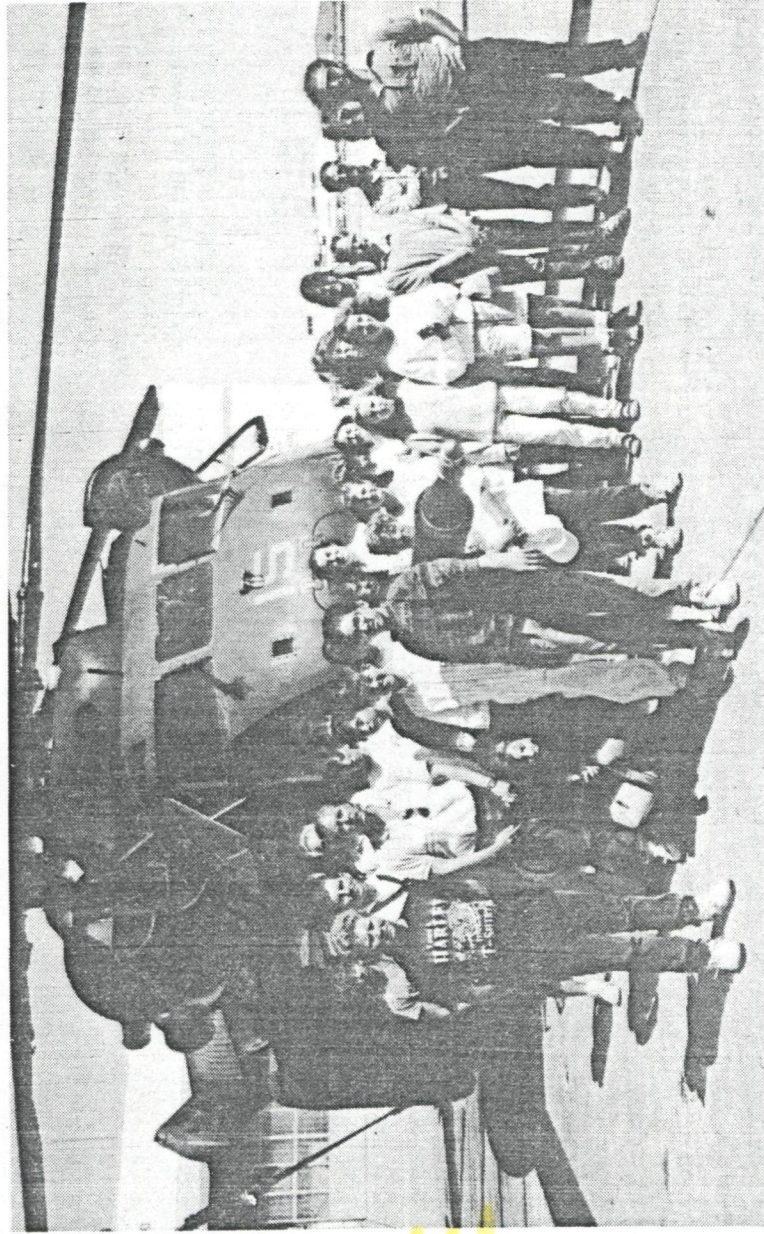
Flight Simulators, helicopters and military barracks provided 8th grade Aviation Science students with a unique experience recently.

Traveling to the Oakland area by private vehicles, the students spent two nights in the barracks at the Naval Air Station and were allowed special access to the Aviation training facilities and the "chow hall".

The students were given a general orientation to military careers in the Navy, but spent most of their time working with flight Simulators for A-3, A-4 and A-6 jets.

The students were also given an orientation tour of the maintenance and flight squadrons of the HM-15 mine sweeping helicopters.

Most of the students have been involved with the study of aviation and aerospace technologies for the past two years. Working with IBM computers at their school, the students have been involved with computer aircraft design and flight



Coulterville-Greeley Aviation Students with HM-15 SuperStallion Helicopter at Alameda Naval Air Station. Photo by C.E. Somers, Lt. USN.

simulation programs. The students flown a Cessna 150 airplane from runways in Columbia and Pine Mountain Lake.

The Aviation Science program is an incentive study program offered to eighth grade students at the Coulterville-Greeley School.



Josh Bowen, Lisa Miller and School Principal Rob Reinhardt with the KCRA "LIVECOPTER" at the Sacramento Aviation Fair. Photo by Tom Murphy

Junior high school students fly to Sacramento

On May 2, two eighth grade students from the Coulterville-Greeley School flew to Sacramento in a Cessna 172 to participate in the 8th annual Aviation Fair at Sacramento Executive Airport. Invited by the Eagle Flight Team, fourteen year old students Lisa Miller and Josh Bowen set up a demonstration area to inform visitors about their school aviation program and IBM computer flight simulator systems.

Sponsored by the Sacramento Valley 99's and the Women's International Pilot Organization, the fair offered the public an opportunity to look at antique airplanes, aircraft operated by the Department of Fish and Game, law enforcement agen-

cies, and the KCRA channel 3 "LIVECOPTER". Tours of the control tower and safety meetings with the Federal Aviation Administration were also available.

The Coulterville-Greeley students showed children and adults of all ages how to operate their IBM computer flight simulator program. The students also provided information about the aviation program at their school that includes flight instruction in Cessna aircraft from Columbia Aviation Flight School with owner and Certified Flight Instructor Stephen Fairchild.

The aviation program for the 7th/8th grade students is an incentive program developed last year

by school principal Rob Reinhardt that includes ground school classes, flight instruction, and field trips to regional aviation centers.

Twenty two eighth grade aviation students will be travelling to San Francisco later this month and will stay for two nights in the barracks of the Alameda Naval Airstation. The students will tour military aircraft, visit the San Francisco International Airport, control tower, and spend an afternoon at the United Airlines Maintenance and Operations Center where they will learn about large commercial jets and occupational careers available in the field of aviation.



Photo by Rob Reinhardt
Coulterville Greeley student Josh Bowen gave IBM flight simulator lessons to hundreds of visitors at the Air Fair.

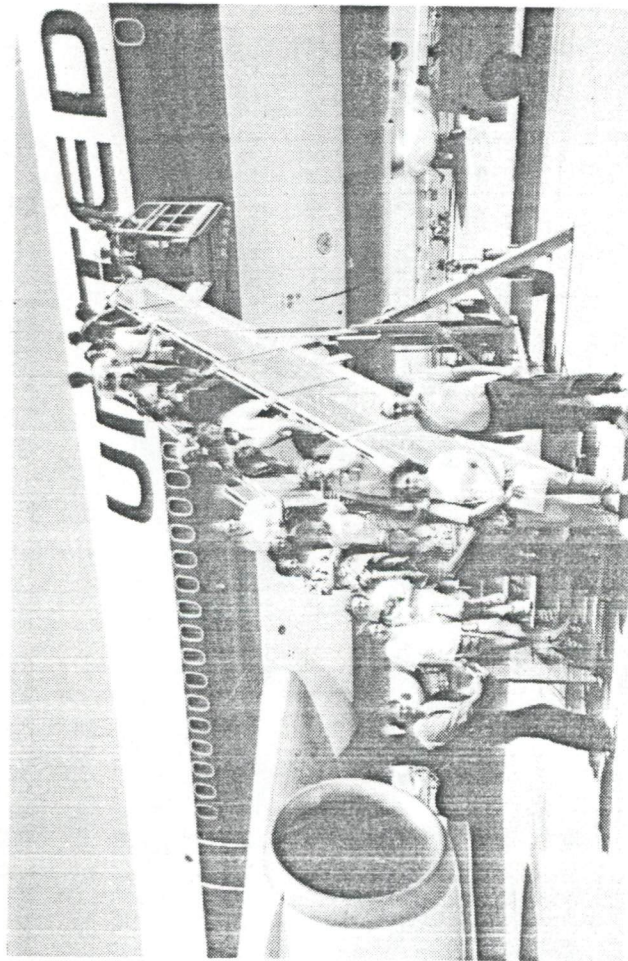


Photo by Rob Reinhardt
Coulterville-Greeley Aviation students and one of the United Airlines jets that they toured at San Francisco International Airport.

Students Visit United Airlines

The eighth grade Aviation Science class from the Coulterville-Greeley School visited the United Airlines Maintenance and Operations Center in San Francisco recently. As part of a three day field trip to visit aerospace technology centers, the class visited Alameda Naval Air Station, the San Francisco International Airport and United Airlines.

The United Airlines maintenance center is a huge complex that includes three million square feet of floor space. Over 13,000 employees repair or make required changes to over 1,200 airplanes each year.

Approved by United Airlines Director Ray Goldsby, the group was allowed to tour throughout the complex with lead mechanic and pilot Larobb Lee. The students were allowed to visit many areas of the center, including the jet engine section that repairs over 1,200 jet engines each year.

The group was also allowed access to the cockpit areas of a 757, DC10, 747 and a redesigned 747 that included a flat glass instrument panel and avionics that will automatically take off and land the huge jets.

The students have been studying aviation science, working with flight simulators and flying in a Cessna airplane as part of their aviation class.

The field trip was designed to allow the students an opportunity to see career occupation fields in the military and commercial aviation industries.

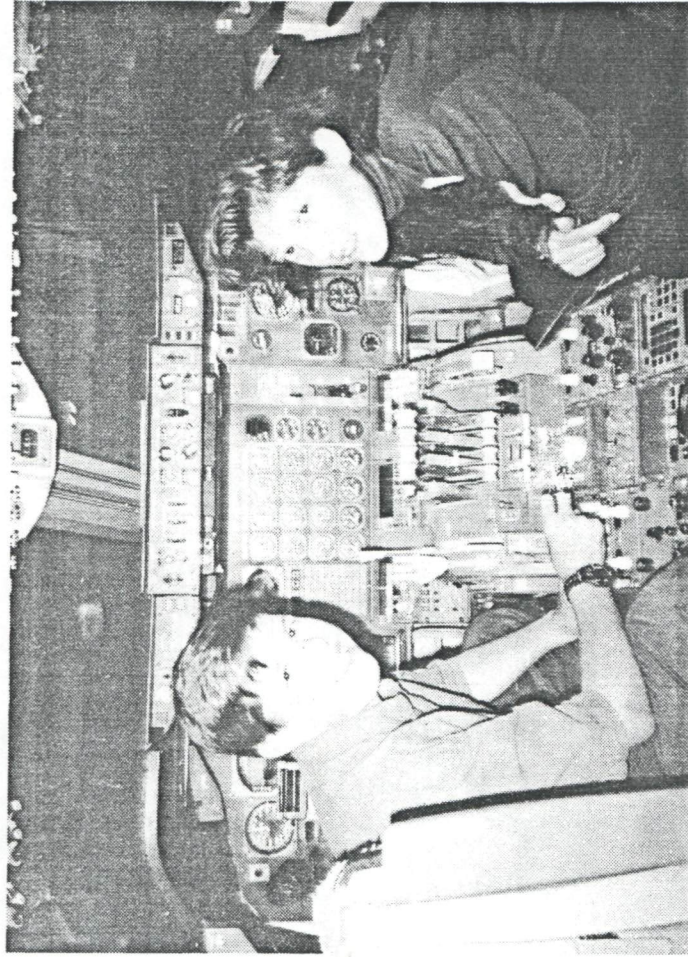


Photo by Rob Reinhardt
Eighth grade Aviation students Donnie Garcia and Alisha Rodriguez checked out the new "flat glass" instrument panel of a 747 United Airlines jumbo jet.

Fifth Grade Class Visits Castle Air Force Base

On May 26, the fifth grade class of the Coulterville-Greeley School visited Castle Air Force Base. The group has been studying aviation history, space and technology with their teacher Pam Henderson and principal Rob Reinhardt.

Visiting the museum, the group was able to see many different types of military aircraft including a B-17 and an SR-71 Blackbird. Mr. Trent Wells (a WWII P-51 pilot) and Mr. John Lewis (a WWII P-38 pilot) travelled with the group and gave the students information about some of the aircraft from their personal experiences.

The group was also given tours, by Sgt. Gaddy, of an active duty B-52 and a KC-135. Flight crews from both aircraft provided tours and information about their airplanes.

Next year the students will continue their study of aerospace technology using computer flight simulators and other activities that may include a trip to Edwards Air Force Base to watch a Space Shuttle Landing.

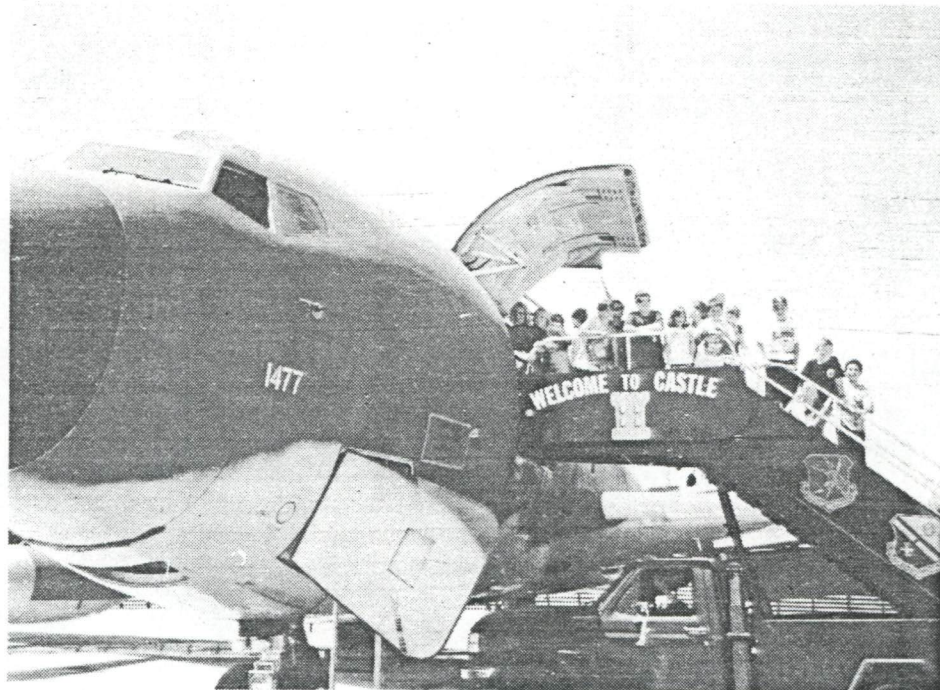


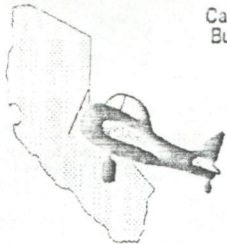
Photo by Rob Reinhardt

The fifth grade class toured a KC-135 at Castle Air Force Base.



Photo by Rob Reinhardt

Fifth grade students Kelley Wallace, Michele Cereghino, Erika Hartsog and Donna Breton in the cockpit of a KC-135 at Castle Air Force Base.



Cari D. Covitz, Secretary
Business, Transportation & Housing Agency

Pete Wilson
Governor

James W. van Loben Sels
Director of Transportation

CALIFORNIA AVIATION

WINTER 1991/92

news

DEPARTMENT OF TRANSPORTATION - DIVISION OF AERONAUTICS

AVIATION-AEROSPACE WEEK ACTIVITIES

Governor Pete Wilson announced in a letter "I have proclaimed the week of October 6-12, 1991 as Aviation-Aerospace Week in California. This week represents a most appropriate way for all Californians to recognize the contributions made by our state's aviation and aerospace industries", and urged members of these industries to join in celebrating by demonstrating their effort, products, services, and continuing economic contributions to California. He also stated his intention to proclaim the second week of October every year as Aviation-Aerospace Week in California, in recognition of the industries' important role in California's continuing prosperity.

Several communities and aviation groups sponsored events during the week. The following are highlights of the results of the efforts expended by airports, companies, and aviation organizations.

tendees enjoyed an informative conference, with speakers from around the U.S.

Aircraft owners at Pine Mountain Lake Airport held an open house for aviation students from the Coulterville-Greeley School during Aviation-Aerospace

Week. The aviation science class was started in 1990 as an elective study program for the Mariposa County School. Student interest in the study of aviation led to a continuation of the program that includes actual aircraft flight instruction through an agreement with Columbia Aviation Flight School.

*Oct. 15th, 1992
will be our 2nd annual
air show!*

**COULTERVILLE - GREELEY
ELEMENTARY SCHOOL, K-8**

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ROBERT REINHARDT
Principal



"QUALITY CITIZENS THROUGH QUALITY EDUCATION"