DOCUMENT RESUME

ED 361 190 SE 053 596

AUTHOR Carter, Constance, Comp.; Howland, Joyce, Comp.
TITLE Space Science Projects. LC Science Tracer Bullet.
INSTITUTION Library of Congress, Washington, DC. Science and Technology Div.
REPORT NO ISSN-0090-5232; TB-92-7
PUB DATE Mar 93
NOTE 17p.; For earlier bibliographies (1986, 1989) on the same topic, see ED 288 716 and ED 313 232.
AVAILABLE FROM Science Reference Section, Science and Technology Division, Library of Congress 10 First Street, S.W., Washington, DC 20540.
PUB TYPE Reference Materials - Bibliographies (131) -- Guides - Classroom Use - Teaching Guides (For Teacher) (052)

EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS *Astronomy; Elementary School Science; Elementary Secondary Education; High Schools; *Science Education; *Science Projects; Secondary School Science; *Space Sciences

ABSTRACT

This document presents sources to assist elementary and secondary school students and teachers in planning, preparing, and executing projects in the space sciences. Bibliographies for the following sections are included: (1) Basic Texts, (2) Specialized Texts, (3) Classroom Experiments and Activities, (4) Background Readings, (5) Related Titles, (6) Handbooks and Encyclopedias, (7) Bibliographies, (8) Book/Film Reviews and "Best Book" Sources, (9) Abstracting and Indexing Services, (10) Representative Journal Articles, (11) Selected Materials, and (12) Additional Sources of information. A list of relevant Library of Congress subject headings is also included. (PR)

LC Science Tracer Bullet

Science Reference Section, Science and Technology Division
Library of Congress, 10 First Street, S.E., Washington, D.C. 20540

ISSN 0090-5232

SPACE SCIENCE PROJECTS

Compiled by Constance Carter and Joyce Howland

TB 92-7 **March 1993**

SCOPE: Sources to assist elementary and secondary school students and teachers in planning, preparing, and executing projects in the space sciences. Sources in other areas of science and on science fairs themselves are listed in Science Fair Projects (LC Science Tracer Bullet 91-12). This compilation is not intended to be a comprehensive bibliography, but is designed—as the name of the series implies—to put the reader "on target."

INTRODUCTION

Millspaugh, Ben P. *Aviation and space science projects.* Blue Ridge Summit, Pa., TAB Books, c1992. 133 p. TL547.M63 1991

Includes projects dealing with air density, wind, balloons, gliders, spacecraft, and many more aviation and space related categories.

SUBJECT HEADINGS used by the Library of Congress, under which books on space science projects can be located in most card, book, and online catalogs, include those listed below.

ASTRONAUTICS—EXPERIMENTS (Highly relevant)
ASTRONOMY—EXHIBITIONS (Highly relevant)
ASTRONOMY—EXPERIMENTS (Highly relevant)
EARTH SCIENCES—EXPERIMENTS (Highly relevant)
SCIENCE—EXHIBITIONS (Highly relevant)
SCIENCE—EXPERIMENTS (Highly relevant)
See also subdivision EXPERIMENTS under subject headings of particular interest, such as AIR, FLIGHT, PHYSICS
SCIENCE PROJECTS—(Highly relevant)
SPACE FLIGHT—EXPERIMENTS (Highly relevant)
SPACE SCIENCES—EXPERIMENTS (Highly relevant)
SPACE SHUTTLES—EXPERIMENTS (Highly relevant)
CLOSED ECOLOGICAL SYSTEMS (SPACE ENVIRONMENT) (Relevant)
COSMIC PHYSICS (Relevant)
MANNED SPACE FLIGHT (Relevant)

OUTER SPACE—EXPLORATION (Relevant)
ROCKETS (AERONAUTICS)—(Relevant)
SCIENCE—STUDY AND TEACHING (Relevant)
See also subdivisions STUDY AND TEACHING; PROBLEMS, EXERCISES, ETC.; and AMATEURS' MANUALS under subject headings of interest, such as ASTRONOMY, ASTROPHYSICS, or SPACE SCIENCES
SKYLAB PROGRAM (Relevant)
SPACE BIOLOGY (Relevant)
SPACE MEDICINE (Relevant)
SPACE STATIONS (Relevant)
SPACE VEHICLES (Relevant)
SPACELAB PROJECT (Relevant)
SPACE INDUSTRIALIZATION (Related)
RESEARCH—METHODOLOGY (More general)

BASIC TEXTS

Bombaugh, Ruth. *Science fair success.* Hillside, N.J., Enslow Publishers, c1990. 96 p. Bibliography: p. 85-87. Q182.3.B66 1990
List of suppliers: p. 75-84.
A guide for choosing, designing, and completing an investigative science fair project, with an appendix listing prize-winning projects by junior high school students.

Bonnet, Robert L., and Dan Keen. *Space and astronomy: 49 science fair projects.* Blue Ridge Summit, Pa., TAB Books, c1992. 128 p. QB64.B64 1991
Suggests a variety of astronomy projects suitable for science fairs, involving the stars, moon, planets, and Milky Way.

Gardner, Robert. *Projects in space science.* New York, J. Messner, 1988. 128 p. QB500.264.G37 1988
Information about and experiments relating to the origin of the solar system, the laws of motion, natural forces affecting orbiting objects, man's future in space, and other aspects of space science.

The Long duration exposure facility (LDEF): mission 1 experiments. Edited by Lenwood G. Clark and others. Washington, Scientific and Technical Information Branch, National Aeronautics and Space Administration; Springfield, Va., for sale by the National Technical Information Service, 1984. 189 p. (NASA SP-473) QB500.264.L66 1984

McKay, David W., and Bruce G. Smith. *Space science.* New York, F. Watts, 1986. 127 p. QB500.264.M36 1986
Ideas and instructions for a variety of science projects that examine the characteristics of the space environment and consider forces such as gravity, magnetism, and buoyancy.

Moeschl, Richard. *Exploring the sky: 100 projects for beginning astronomers*. Chicago, Chicago Review Press, c1989. 339 p. QB64.M6 1989
Rev. ed. to be published in March 1993.
Presentation of projects includes information on related mythology and pertinent history, cultures, and people.

Moulton, Robert R. *First to fly*. Foreword by James A. Abrahamson. Minneapolis, Lerner Publications Co., c1983. 119 p. QL496.7.M68 1983
An account of 18-year-old Todd Nelson's experiment, "Insect in Flight Motion Study," which was the first student experiment ever to fly aboard a manned space shuttle flight.

Simon, Seymour. *How to be a space scientist in your own home*. New York, Lippincott, c1982. 83 p. QB500.S545 1982
A collection of experiments using easily available, inexpensive materials, which duplicate some principles and problems encountered in space flight.

Vogt, Gregory. *The space shuttle*. New York, F. Watts, 1983. 122 p.
Includes bibliographical references. QB500.264.V63 1983
Discusses experiments proposed by high school students that have been performed aboard Skylab and gives advice to those interested in similar space research competitions.

SPECIALIZED TEXTS

Apfel, Necia H. *Astronomy projects for young scientists*. New York, Arco Pub., c1984. 122 p. QB62.7.A64 1984
Instructions for a variety of experiments in astronomy including making a telescope, building a planetarium, measuring the circumference of the Earth, and detecting cosmic rays.

Covington, Michael A. *Astrophotography for the amateur*. Rev. ed. Cambridge, New York, Cambridge University Press, c1991. 168 p. QB121.C68 1991

Docekal, Eileen M. *Sky detective: investigating the mysteries of space*. New York, Sterling Pub. Co., 1992. 128 p. QB63.D55 1992
Text and suggested activities help the reader explore the many aspects of the night sky, including the stars, constellations, and planets.

Lunetta, Vincent N., and Shimshon Novick. *Inquiring and problem-solving in the physical sciences: a sourcebook*. Dubuque, Iowa, Kendall/Hunt Pub. Co., c1982. 202 p. Q182.3.L86 1982 <SciRR>

Petty, Kate. *Build your own space station*. New York, F. Watts, 1985. 30 p. TL844.P48 1985
Step-by-step instructions for constructing a space station and space vehicles out of materials available at home or school.

Robson, Pam. *Air, wind & flight.* New York, Gloucester Press, 1992. 32 p. TL547.S42 1992

Examines flight, propulsion, and power, and applies basic principles of aerodynamics to explore and experiment with the properties of air.

Sweet potato for space missions—controlled environmental life support systems. Editors, Walter A. Hill, Philip A. Loretan, Conrad K. Bonsi. Tuskegee Institute, Ala., Carver Research Foundation of the Tuskegee Institute, George Washington Carver Agricultural Experiment Station, c1984. 81 p. (George Washington Carver Agricultural Experiment Station monograph, #1)
Bibliography: p. 67-81. SB211.S9S93 1984 and <SciRR Pamphlet Box>

Trowbridge, Leslie W. *Experiments in meteorology: investigations for the amateur scientist.* Garden City, N.Y., Doubleday, 1973. 270 p. QC863.4.T76 <SciRR>
Bibliography: p. 255-259.

VanCleave, Janice Pratt. *Janice VanCleave's astronomy for every kid: 101 easy experiments that really work.* New York, Wiley, c1991. 229 p. QB46.V36 1991
An elementary science experiment book that provides young scientists with safe, workable astronomy projects.

Zubrowski, Bernie. *Balloons: building and experimenting with inflatable toys.* New York, Morrow Junior Books, c1990. 79 p. QC33.Z83 1990

CLASSROOM EXPERIMENTS AND ACTIVITIES

Aviation science activities for elementary grades. Rev. 1983. Washington, Office of Public Affairs, Aviation Education Programs, Federal Aviation Administration, U.S. Dept. of Transportation, 1985. 33 p. <SciRR Pamphlet Box>
"GA-20-30."

Cole, Peggy R., and Gerald L. Mallon. "One planetarium—to go!" *Science teacher*, v. 54, Mar. 1987: 25-27. Q181.S38

Fraknoi, Andrew. *Universe in the classroom: a resource guide for teaching astronomy and instructor's manual for Universe by William J. Kaufmann, III.* New York, W. H. Freeman, c1985. 269 p. QB61.F73 1985

Handbook two for aerospace education; a guide to projects and applications. Edited by John Paul Rossie. Ann Arbor, Mich., Prakken Publications, c1991. 1 v. (various pagings) TL845.H36 1991
"Aerospace Educational Development Program in cooperation with the National Space Society."

Hemenway, Mary Kay, and R. Robert Robbins. *Modern astronomy: an activities approach.* 1st rev. ed. Austin, University of Texas Press, 1991. 228 p.
Robbins' name appears first on the 1982 ed. QB62.7.H46 1991

Hosking, Wayne. *Flights of imagination: an introduction to aerodynamics*. Washington, National Science Teachers Association, c1987. 55 p. MLCM 92/01255 (T)
Rev. ed. announced for publication in 1990.

Kastner, Bernice. *Space mathematics: a resource for secondary school teachers*. Washington, National Aeronautics and Space Administration, 1985. 192 p. TL845.K37 1985
"A curriculum project prepared by the National Council of Teachers of Mathematics."

Mallon, Gerald L. Cosmic journeys. *Science teacher*, v. 54, Mar. 1987: 28-30. Q181.S38
"This daily program of hands-on activities is an astronomical tour de force."

Matloff, Gregory L. *Telescope power: fantastic activities and easy projects for young astronomers*. New York, J. Wiley, c1993. QB88.M378 1993
To be published in July 1993. NOT YET IN LC

NASA educational briefs. Wash ıgton, National Aeronautics and Space Administration, 1980?- <SciRR Pamphlet Box>
Partial contents: EB 81-1. Space shuttle statistics.—EB 81-2. Space shuttle suit.—EB 81-3. Images from space.—EB 82-9. Robotics in space.—EB 83-8. STS-9 and Spacelab 1.—EB 83-9. STS-9 and amateur radio.

Schaaf, Fred. *Seeing the deep sky: telescopic astronomy projects beyond the solar system*. New York, Wiley, c1992. 206 p. QB64.S426 1992
Bibliography: p. 199-202.

Schaaf, Fred. *Seeing the sky: 100 projects, activities, and explorations in astronomy*. New York, Wiley, c1990. 212 p. QB64.S427 1990
Bibliography: p. 207-208.

Schaaf, Fred. *Seeing the solar system: telescopic projects, activities, and explorations in astronomy*. New York, Wiley, c1991. 208 p. QB64.S4273 1991
Bibliography: p. 200-203.

Skylab, classroom in space. Edited by Lee B. [i.e. R.] Summerlin. Prepared by George C. Marshall Space Flight Center. Washington, Scientific & Technical Information Office, National Aeronautics and Space Administration; for sale by the Supt. of Docs., U.S. Govt. Print. Off., 1977. 182 p. (NASA SP-401) TL789.8.U6S5675

Smith, P. Sean. *Project earth science: astronomy*. Washington, National Science Teachers Association, c1992. 155 p. QB61.S553 1992
Includes bibliographical references (p. 140-151).

Vacca, John R. Reach for the stars: a time to act. *Space age times*, v. 15, July/Aug. 1988: 4-8. <SciRR Pamphlet Box>
"The crisis in space education and one teacher's solution."

BACKGROUND READINGS

Asimov, Isaac, and Frank White. *Think about space: where have we been and where are we going?* New York, Walker, 1989. 132 p. QB500.22.A84 1989
An overview of the history and present and future role of human beings in space, tracing the development of space exploration and discussing the challenges of the present day and the possibilities of the future.

Baker, David. *The history of manned space flight.* New York, Crown Publishers, 1982. 544 p. TL873.B33 1982 <SciRR>

Berger, Melvin. *Star gazing, comet tracking, and sky mapping.* New York, G. P. Putnam's Sons, c1985. 80 p. QB64.B47 1985
Explains how to learn about stars, constellations, comets, and other astronomical phenomena by studying the sky without a telescope.

Booth, Nicholas. *Space: the next 100 years.* New York, Orion Books, c1990. 128 p. TL793.B633 1990

Compton, William David, and Charles D. Benson. *Living and working in space: a history of Skylab.* Washington, Scientific and Technical Information Branch, National Aeronautics and Space Administration; for sale by the Supt. of Docs., U.S. Govt. Print. Off., 1983. 449 p. (NASA SP-4208)
Bibliography: p. 397-442. TL789.8.U6S5546 1983 <SciRR>

Gallant, Roy A. *Rainbows, mirages, and sundogs: the sky as a source of wonder.* New York, Macmillan, c1987. 94 p. QC975.3.G45 1987
Discusses and explains visual phenomena seen in the sky, primarily interactions of light and atmosphere such as rainbows, mirages, the twinkling of stars, the blue color of the sky, and the northern lights.

Herbst, Judith. *Sky above and worlds beyond.* New York, Atheneum, 1983. 228 p.
Bibliography: p. 222-223. QB46.H38 1983
An introduction to astronomy, examining planetary and stellar motions, ancient concepts of the universe, the solar system, astronomy's wild goose chases, Einstein's mass/time relationship, stellar evolution, and the unexplained mysteries of space. Includes star charts.

Life in space. Alexandria, Va., Time-Life Books, 1983. 304 p. TL793.5.L53 1983 <Folio>

Moore, Patrick. *Space travel for the beginner.* New York, Press Syndicate of the University of Cambridge, 1992. 48 p. TL793.M654 1992

Solomon, Maury. *An album of Voyager.* New York, F. Watts, 1990. 64 p. QB602.S65 1990
Describes the functions of the Voyager spacecraft, as well as what it has helped us to learn about other planets in the solar system.

Stine, G. Harry. *Handbook for space colonists*. New York, Holt, Rinehart, and Winston, c1985. 273 p. TL793.S758 1985

Weiss, Malcolm E. *Far out factories: manufacturing in space*. New York, Dutton, c1984. 84 p. TL797.W43 1984

RELATED TITLES

Baird, Anne. *Space Camp: the great adventure for NASA hopefuls*. Foreword by Alan B. Shepard, Jr.; introduction by Edward O. Buckbee. New York, Morrow Junior Books, 1992. 48 p. TL793.B225 1992

"The Official U.S. space camp book."

Text and photographs follow young campers as they experience NASA-style astronaut training at the Space Camp in Huntsville, Alabama.

Benford, Timothy B., and Brian Wilkes. *The space program quiz & fact book*. Introduction by Frank Borman. New York, Harper & Row, c1985. 257 p. TL793.B395 1985

Chaple, Glenn F. *Exploring with a telescope*. New York, F. Watts, 1988. 142 p. QB88.C47 1988

Describes the history, parts, operation, and care of telescopes and provides tips on viewing objects on land and in space.

Hawthorne, Douglas B. *Men and women of space*. San Diego, Calif., Univelt, c1992. 904 p. TL789.85.A1H38 1992 <SciRR>

Krieger, Melanie Jacobs. *How to excel in science competitions*. New York, F. Watts, 1991. 143 p. Q182.3.K75 1991 <SciRR>

Bibliography: p. 139-140.

A guide for the high school student researching a science project for entry in a competition.

Sheffield, Charles, and Carol Rosin. *Space careers*. New York, Morrow, 1984. 240 p. TL850.S54 1984

Space Station Program: description, applications, and opportunities. By Space Station Task Force, National Aeronautics and Space Administration. Park Ridge, N.J., Noyes Publications, c1985. 754 p. TL797.S6454 1985 <SciRR>

Spangenburg, Ray, and Diane Moser. *Space people from A-Z*. New York, Facts on File, c1990. 100 p. TL789.85.A1S73 1990 <SciRR>

Vogt, Gregory. *Space laboratories*. New York, F. Watts, c1989. 32 p. MLCM 92/01650 (T)

HANDBOOKS AND ENCYCLOPEDIAS

Berry, Richard. *Build your own telescope*. New York, Scribner, c1985. 276 p. Bibliography: p. 265-271. QB88.B47 1985

Gibson, Bob. *The astronomer's sourcebook: the complete guide to astronomical equipment, publications, planetariums, organizations, events, and more*. Rockville, Md., Woodbine House, 1992. 302 p. QB64.G43 1992 <SciRR>

Harrington, Philip S. *Touring the universe through binoculars: a complete astronomer's guidebook*. New York, Wiley, c1990. 294 p. QB64.H37 1990

Humphrey, Colin. *The amateur astronomer's pathfinder*. New York, Wiley, c1992. 143 p. QB63.H76 1992

The Illustrated encyclopedia of space technology. Kenneth Gatland, consultant and chief author. 2nd ed. New York, Orion Books, 1989. 303 p. TL788.I44 1989 <SciRR>

Lewis, Richard S. *The illustrated encyclopedia of the universe: exploring and understanding the cosmos*. New York, Harmony Books, c1983. 320 p. QB501.2.L48 1983 <SciRR>

Matloff, Gregory L. *The urban astronomer: a practical guide for observers in cities and suburbs*. New York, Wiley, c1991. 224 p. QB63.M43 1991 Bibliography: p. 169-177.

Ridpath, Ian. *The young astronomer's handbook*. New York, Arco, 1984, c1981. 224 p. QB46.R545 1984

Stine, G. Harry. *The handbook of model rocketry*. Rev. 5th ed. New York, Arco Pub., c1983. 367 p. TL844.S77 1983 Official handbook of the National Association of Rocketry.

BIBLIOGRAPHIES

Educators guide to free science materials. 1st- ed.; 1960- Compiled and edited by Mary H. Saterstrom. Randolph, Wis., Educators Progress Service. annual. Q181.A1E3 <SciRR>

Kennedy, DayAnn M., Stella S. Spangler, and Mary Ann Vanderwerf. *Science & technology in fact and fiction: a guide to young adult books*. New York, Bowker, c1990. 363 p. Z7401.K46 1990b <SciRR>

Pilger, Mary Anne. *Science experiments index for young people.* Englewood, Colo., Libraries Unlimited, 1988. 239 p. Q182.3.P735 1988 <SciRR>
Indexes experiments and activities in 694 elementary and intermediate science books.
—— —— Update 91. Englewood, Colo., Libraries Unlimited, 1992. 133 p.
Indexes an additional 329 books. Q182.3.P55 1992 <SciRR>

Science experiments on file: experiments, demonstrations, and projects for school and home. New York, Facts on File, c1989. 1 v. (loose-leaf)
Q182.3.S33 1989 <SciRR>
"All of the experiments were obtained from a select group of master teachers—winners and finalists of the prestigious Presidential Award for Excellence in Science Teaching, named by the National Science Foundation."
Intended as a resource for students, grades 6-12.
See also *More Science Experiments on File* (New York, Facts on File, 1991. 1 v. (loose-leaf) Q182.3.M67 1990), which offers 80 new projects for grades 3-12.

Science fair project index. 1960-1972. Compiled by the staff of the Science and Technology Division of the Akron Summit County Public Library; edited by Janet Y. Stoffer. Metuchen, N.J., Scarecrow Press, 1975. 728 p.
Q182.3.S34 1975 <SciRR>
—— 1973-1980. Edited by Science and Technology Division, Akron-Summit County Public Library. Metuchen, N.J., Scarecrow Press, 1983. 723 p.
Q182.3.S34 1975 Suppl. <SciRR>
—— 1981-1984. Edited by Cynthia Bishop, Deborah Crowe, Science and Technology Division, Akron-Summit County Public Library. Metuchen, N.J., Scarecrow Press, 1986. 696 p. Q182.3.S34 1975 Suppl. 2 <SciRR>
—— 1985-1989. Edited by Cynthia Bishop, Katherine Ertle, Karen Zeleznik. Prepared by the Science and Technology staff of the Akron-Summit County Public Library. Metuchen, N.J., Scarecrow Press, 1992. 555 p.
Q182.3.S34 1975 Suppl. 3 <SciRR>

Science for children: resources for teachers. National Science Resources Center, Smithsonian Institution—National Academy of Sciences. Washington, National Academy Press, 1988. 176 p. Z5818.S3S38 1988 <SciRR>

Science project information index, 1973-1983. Edited by Alex Spence. Toronto, Infolib Resources, c1984. 282 p. Q182.3.S64 1984
Bibliography: p. 279-282.

The Second science project information index. Edited by Alex Spence. Toronto, Infolib Resources, c1986. 144 p. <SciRR Science Fair Projects Pamphlet Box>
Bibliography: p. 141-144.

BOOK/FILM REVIEWS AND "BEST BOOK" SOURCES

Appraisal: science books for young people. v. 1- winter 1967- Boston, Children's Science Book Review Committee. Z7401.A63

New York Public Library. *New technical books.* v. 1- June/Aug. 1915- New York. SciRR keeps current and last two years' issues only. Z5854.N542 <SciRR>

Malinowsky, H. Robert. *Best science and technology reference books for young people.* Phoenix, Oryx Press, 1991. 216 p. Z7401.M277 1991 <SciRR>

Morrison, Philip, and Phylis Morrison. Science books for young people. *Scientific American*, v. 263, Dec. 1992: 148-156. T1.S5

Outstanding science trade books for children in 1990. *Science and children*, v. 28, Mar. 1991: 30-37. <SciRR Best Books Vertical File>
The annotated list is a regular feature of the March issue.

Science books & films. v. 1- Apr. 1965- Washington, American Association for the Advancement of Science. Z7403.S33 <SciRR A&I>

Science books & films' best books for children, 1988-91. Maria Sosa, Shirley M. Malcom, editors. Washington, American Association for the Advancement of Science, c1992. 300 p. (AAAS publication, 92-30H) Z7401.S362 1992 <SciRR>

Science & technology: a purchase guide for libraries. Pittsburgh, Carnegie Library of Pittsburgh, Science and Technology Dept., 1992. 168 p.
<SciRR Best Books Vertical File>
Published annually since 1963, this is an annotated bibliography of new books in science, technology, consumer medicine, and related subjects intended primarily for the general adult reader. A special feature is the selection of books for libraries which buy only 50-100 titles each year.

Wolff, Kathryn, Susan M. O'Connell, and Valerie J. Montenegro. *AAAS science book list, 1978-1986.* Washington, American Association for the Advancement of Science, 1986. 568 p. (AAAS publication, 85-24) Q181.A1A68 no. 85-24 <SciRR>

ABSTRACTING AND INDEXING SERVICES that index relevant journal articles and other literature on science projects in general are listed below. Some suggested terms are given as aids in searching. Space sciences material will be indexed under terms beginning ASTRONOMY, ASTRONAUTICS, SPACE, etc. The following indexes are available in most public and college libraries. Consult reference librarian for locations of these materials in Science Reading Room; some are available in CD-ROM format.

Applied Science & Technology Index (1913-) Z7913.I7 <SciRR>
See: Science—Exhibits
Science—Experiments

Current Index to Journals in Education (1969-) Z5813.C8 <MRR Alc>
See: Science Activities
Science Experiments
Science Fairs
Science Projects

Science Talent Search

Education Index (1929-) Z5813.E23 <MRR Alc>
See: Science--Activities
Science--Exhibits
Science--Experiments
Science--Projects

General Science Index (1978-) Z7401.G46 <SciRR>
See: Science Fairs, School
Science--Exhibitions

Magazine Index (1980-) Available in several formats
See: Science--Exhibitions
Science--Experiments

Readers' Guide to Periodical Literature (1900-) AI3.R45 <B&E>
See: Science Fairs
Science Fairs, School
Science--Experiments
Science Talent Search

Resources in Education (1966-) Z5813.R4 <MRR Alc>
See: Science Activities
Science Experiments
Science Fairs
Science Projects

Vertical File Index (1932-1934-) Z1231.P2V48 <MRR Alc>
See: Science--Study and Teaching
Subject of interest, e.g., Astronomy, Chemistry

Students may also need to use space-oriented and more technical abstracting and indexing services for further information. Sample titles are listed below. These titles may be available only in large or specialized libraries.

Aerospace Medicine and Biology (1952-)
Air University Library Index to Military Periodicals (1949-)
Astronomy and Astrophysics Abstracts (1969-)
Engineering Index (1884-)
Government Reports Announcements & Index (1946-)
International Aerospace Abstracts (1961-)
Mathematical Reviews (1940-)
Metals Abstracts (1968-)
Meteorological & Geoastrophysical Abstracts (1950-)
Scientific and Technical Aerospace Reports (1963-)
Science Citation Index (1955-)

JOURNALS that often contain articles relevant to space science projects include the following:

Ad Astra TL787.A277
Aerospace America TL501.A688A25
Astronomy QB1.A7998
Aviation Week & Space Technology TL501.A8
Odyssey QB46.03a
Physics Teacher QC30.P48
Popular Mechanics Magazine T1.P77
Science Activities Q181.A1S29
Science and Children LB1585.S34
Science News Q1.S76
Science Probe! Q162.S415
Science Teacher Q181.S38
Scientific American T1.S5
See particularly "Amateur scientist" feature which appears each month.
Sky & Telescope QB1.S536
Spaceflight TL787.B725
The Universe in the Classroom: a Newsletter on Teaching Astronomy NOT IN LC

REPRESENTATIVE JOURNAL ARTICLES

Bartlett, Albert A., and Charles W. Hord. The slingshot effect: explanation and analogies. *Physics teacher*, v. 23, Nov. 1985: 466-473. QC30.P48

Beggs, James M., and others. Space station 1995. *Aerospace America*, v. 23, Sept. 1985: 44-52, 56-62, 66-67, 70-74, 76. TL501.A688A25

Carroll, W. F., and others. Should we make products on the moon? *Astronautics & aeronautics*, v. 21, June 1983: 80-85. TL501.A688A25

Culbertson, Philip E. Using space. *Chemtech*, v. 15, Apr. 1985: 214-217. TP1.I612

Davies, John. Science from the Space Station. *Space education*, v. 1, autumn/winter 1986/87: 560-563. <SciRR Pamphlet Box>

Hillman, Alan L. After the *Challenger*: biomedical opportunities in space. *New England journal of medicine*, v. 315, Nov. 6, 1986: 1196-1200. R11.B7

Loftus, Joseph P. Man's role in space exploration and exploitation. *Spaceflight*, v. 29, June 1987: 240-247. TL787.B725

Martin, Helen E. Could *you* build a satellite tracking station? Don't say 'no' until you try. *Science teacher*, v. 54, Jan. 1987: 15-17. Q181.S38

Meyers, Marilyn. Space Camp diary. *Space world*, v. Y-4-292, Apr. 1988: 14-15. TL787.S72

Rapp, Carl Steven. Build your own radio telescope; avoid the astronomical costs of high-tech equipment. *Science teacher*, v. 60, Jan. 1993: 35-36. Q181.S38

Russo, Richard. Solstice science: a lesson in archaeoastronomy. *Science teacher*, v. 59, Dec. 1992: 14-17. Q181.S38

Shugrue, Sylvia K. Astronomy with a stick; daytime astronomy for fifth- and sixth-grade students. *Science activities*, v. 28, winter 1991/92: 27-37. Q181.A1S29

Van Allen, James A. Space science, space technology and the space station. *Scientific American*, v. 254, Jan. 1986: 32-39. T1.S5

Vander Linde, Karen. SEEDS in space. *Science and children*, v. 22, Sept. 1984: 26. LB1585.S34

SELECTED MATERIALS available in the Science Reading Room pamphlet boxes include:

Beabout, Greg. Your first date with a 2.4-inch scope; use these tips to set up your first scope and start observing planets and deep-sky objects. *Astronomy*, v. 21, Jan. 1993: 80-85.

Bole-Becker, Luanne C. The Challenger Center: keeping the dream alive; the educational legacy of the Challenger crew will connect them to the students of tomorrow. *Ad astra*, v. 2, Sept. 1990: 23-26.

Cobaugh, Stephen M. Discovery flight gave young experimenters a second chance. *Space age times*, v. 15, Sept./Oct. 1988: 12-13.

Estabrook, Barry. The crucial experiments. *Science dimension*, v. 17, no. 4, 1985: 21-28. Describes Challenger's Mission 41-G and the experiences of Marc Garneau, Canada's first astronaut in space.

Frazer, Lance. Can people survive in space? Living in zero-g does weird things to the human body. *Ad astra*, v. 3, Oct. 1991: 14-18.

Grigsby, Doris K., and Mary H. Lewis. Tomatoes in space. *Science and children*, v. 21, Mar. 1984: 6-7.

Hofman, Helenmarie. Not for science students only: the Space Science Student Involvement Program offers contests that challenge students talented in art and writing as well as those interested in basic science. In *Science year*. 1993. Chicago, World Book, 1992. p. 148-159.

Metzger, Claire. Ants ride along with Sally. *Science activities*, v. 21, Feb./Mar. 1984: 29-31.

O'Meara, Stephen James. Planet watch: amateur astronomers monitor spectacular clouds and storm systems on Mars, Jupiter, and Saturn. *Science probe!* v. 1, Oct. 1991: 67-74.

Overbye, Dennis. Spacelab: doing science in orbit. *Discover*, v. 5, Feb. 1984: 16-21.

Strickland, John K. The cosmic classroom: a Texas junior high is building its own space station—right here on earth. *Ad astra*, v. 1, Mar. 1989: 20-23.

Teacher in space project. Washington, National Aeronautics and Space Administration, 1985. 16 p.
"The publication is the product of a team effort by NASA, the National Science Teachers Association (NSTA), the National Council for the Social Studies (NCSS), and curriculum professionals."
"NASA Teacher Resource Centers": p. 16.
"Resources": p. 16.

Vogt, Gregory. Rockets: information and activities for elementary teachers to use in preparing students for a unit on model rocketry. Washington, National Aeronautics and Space Administration, 1992. 32 p.
"PED-112."
Includes a list of model rocketry manufacturers (p. 32).

The Young astronaut program; a four-year-old organization offers space education to more than 500,000 elementary and high school students. *Space times*, v. 27, Sept./Oct. 1988: 8-9.

Yulsman, Tom. Experiments in space. *Science digest*, v. 92, July 1984: 39-45, 92-93.

ADDITIONAL SOURCES OF INFORMATION

Astronomical Society of the Pacific
390 Ashton Avenue
San Francisco, California 94112
Telephone: (415) 337-1100

A non-profit scientific and educational organization dedicated to supporting astronomical research and to increasing public understanding and appreciation of science. Its services include organizing workshops on teaching astronomy, the distribution of a catalog of educational aids in astronomy, and the publication of several journals including *Mercury* and *The Universe in the Classroom*, a quarterly newsletter for teachers.

Challenger Center for Space Science Education
1055 North Fairfax Street
Suite 100
Alexandria, Virginia 22314
Telephone: (703) 683-9740

A not-for-profit educational institution that works with educators, scientists, business leaders, and others to create hands-on learning experiences for students and teachers.

Department of Science, Space, and Technology
National Science Teachers Association
1742 Connecticut Avenue
Washington, D.C. 20009
Telephone: (202) 328-5800, ext. 22

Sponsors with NASA, the NEWMAST (NASA Educational Workshops for Math and Science Teachers) Workshops held during the summer at NASA Teacher Resource Centers throughout the country, the NEWEST (NASA Educational Workshops for Elementary School Teachers) Workshops, and the Space Science Student Involvement Program.

Kansas Cosmosphere and Space Center
1100 North Plum Street
Hutchinson, Kansas 67501
Telephone: (316) 662-2305

Offers Discovery workshops for school children and a Future Astronaut Training Program in summer camp sessions for students entering 7th, 8th or 9th grades. Students from across the country and abroad are welcome to apply. All classes are filled on a first-come, first-serve basis.

NASA
Elementary and Secondary Branch
Education Division
NASA Headquarters
300 E Street, S.W.
Code: FEE
Washington, D.C. 20546
Telephone: (202) 358-1518

Provides specialists for school visits and educational materials for teachers through its network of Teacher Resource Centers and CORE.

Educational Publications Branch
Education Division
NASA Headquarters
300 E Street, S.W.
Code: FEP
Washington, D.C. 20546
Telephone: (202) 358-1535

Will distribute free copies of its publications as long as they are in stock.

Central Operation of Resources for Educators (CORE)
NASA
Loraine County Joint Vocational School
15181 Route 58 South
Oberlin, Ohio 44074
Telephone: (216) 774-1051, ext. 293 or ext. 294

Provides NASA educational audiovisual materials by mail to teachers who are not near a Teacher Resource Center. Educators can request a catalog of available materials by writing NASA CORE on school letterhead.

Science Service
1719 N Street, N.W.
Washington, D.C. 20036
Telephone: (202) 785-2255
Administers the International Science and Engineering Fair and the Westinghouse Science Talent Search.

Space and Aviation Education Resource Center
United States Space Foundation
1525 Vapor Trail
Colorado Springs, Colorado 80916
Telephone: (719) 576-8000

U.S. Space Camp
The Space & Rocket Center
Tranquility Base
Huntsville, Alabama 35807
Telephone: (205) 837-3400 or 1-800-63SPACE
Camp term is one week for 4th-9th graders; 10 days for 10th-12th graders.

Young Astronaut Program
1308 19th Street, N.W.
Washington, D.C. 20036
Telephone: (202) 682-1984
Distributes learning packets on subjects such as colonizing space, flight, and the Hubble Space Telescope. The packets include activities for young astronaut leaders and resources for teachers.