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Topic Bibliography on Service with Math and Science Education

By
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Robert D. Shumer, Ph.D.

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INTRODUCTION

The sources listed on the following pages are in response to requests for information on combining service-learning with math and science education. They were obtained primarily by conducting searches of the ERIC database on CD-ROM. Broad topics were chosen for a comprehensive selection of references. With several hundred records identified, only those with the closest relevance to the topic are included here. Where a source is available through EDRS, an ERIC number is included. The search for more sources of information on this topic is ongoing and this compilation will be updated periodically.

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Please send us your comments and suggestions for improving our service.

AUTHOR: Allen, Jo Anna
TITLE: Eureka! A Yurt! Integrating Mathematics, Cooperative Learning, and Community Service.
ABSTRACT: Describes project involving a sixth grade math class planning and building a Yurt using mathematics and other skills. (RVB)

AUTHOR: Atkinson, Marilyn et al.
LENGTH: 168 p.
ABSTRACT: The guide offers a compilation of teacher-developed career education materials which may be integrated with secondary level curriculum in mathematics. Suggested activities and ideas present the following units based on career clusters as they relate to mathematics: construction, communications and media, hospitality and recreation, public service, marine science, health, manufacturing, transportation, and agri-business and natural resources. Activity suggestions for other math-related units are also given including several "silent lectures" emphasizing logical problem solving and units on consumer economics, metrics, computer science, statistics, and other mathematical applications. Objectives, teaching procedure, and related resources and materials are presented for each unit. A 12-page list of suggested local field trip sites and guest speakers is included. (ERIC)

ERIC NUMBER: ED117432
EDRS PRICE: PC07 Plus Postage.
AUTHOR: Chadbourne, Joseph H.
YEAR: 1974
LENGTH: 96 p.
INSTITUTION: Institute for Environmental Education, Cleveland, Ohio.
DESCRIPTORS: Science-Activities; Secondary-Education; Water-Resources; Environment-; Instruction-; Program-Descriptions; Secondary-School-Science; Student-Projects; Water-Pollution
ABSTRACT: Described is the Ohio Watershed Heritage Project. Sections in the publication include the following: (1) history leading to the project; (2) teaching methodology of the program; (3) teacher training; (4) watershed study objectives; (5) local coordinators; (6) evaluation plan; (7) graduate student comments in the program; (8) secondary school teacher comments; (9) secondary student comments; (10) parent comments; (11) observer comments; (12) project dissemination efforts; and (13) adoption and implementation. The project stressed a hands-on learning approach with the emphasis on teaching professionally recognized water quality procedures; these data were provided to the Ohio Environmental Protection Agency (EPA). Accomplishments, problems, and the recommendations for future work are detailed. (ERIC)

ERIC NUMBER: ED134410 (PC Not Available from EDRS)

AUTHOR: Coler, Robert A.; Zatryka, Simon A.
TITLE: Stream Management: A Rebirth
SOURCE: Journal-of-Environmental-Education; 6; 2; 9-11 (1974)
DESCRIPTORS: Community-Involvement; Natural-Resources; Science-Education; Water-Pollution; Conservation-Education; Ecology-; Environmental-Education
ABSTRACT: This article describes a stream management course designed to give non-science majors an in-depth study of water quality. The course includes work in determining and measuring water quality parameters and the discussion of management techniques. Construction of a Hewitt Ramp and wing deflectors are illustrated in the article. (ERIC)

AUTHOR: Copen, Peter
TITLE: Walkabout: An Educational Experience.
YEAR: 1980
LENGTH: 15 p.
INSTITUTION: Putnam and Northern Westchester Counties Board of Cooperative Educational Services, Yorktown Heights, N.Y.
ABSTRACT: The Walkabout program is an optional senior-year educational experience in which New York high school students can acquire the basic skills and confidence to take charge of their lives and contribute to the world. The year-long program is divided into 5 "challenge environments": wilderness (5 weeks); applied academics (18 weeks of health and personal awareness, language arts, social studies, and environmental science); career internship (9 weeks); community service (3 weeks); and final presentation (1 week). These provide students with the opportunity to learn basic and relevant skills, go beyond their self-perceived limitations, recognize their option to change how they deal with others, make meaningful accomplishments, begin to clarify career options, and earn credit toward a high school diploma. Grading is based on an "honors," "credit," or "no-credit" system. The state-approved program is most applicable for average to bright students, either male or female. Interested high school juniors apply and participants are selected for the program from among the applicants. Parent, student, and staff reactions to the program are positive. (ERIC)
ERIC NUMBER: ED197924
EDRS PRICE: PC01 Plus Postage.

AUTHOR: Hart, Richard A.
TITLE: A Manual of Mosquito Control Projects and Committee Assignments for 4-H and Scouts Biology Class Projects, Organized Community Service Programs, and Individuals Interested in Environmental Management.
YEAR: 1980
INSTITUTION: Environmental Protection Agency, Region VIII, 1860 Lincoln St., Denver, CO 80295 (free while supply lasts).
DESCRIPTORS: Biology--; Community-Programs; Environmental-Education; Higher-Education; Mathematics-Education; Science-Education; Secondary-Education; Statistics--
ABSTRACT: The mosquito control projects presented in this manual were prepared from an educational viewpoint and are intended for use by students in 4-H and Scouts and as a supplement to high school and college biology course work. The major emphasis of the projects is on integrated pest management, an approach utilizing cost-effective control methods which minimize environmental and health risks. Projects are organized into three sections: (1) "Getting Organized Projects," which are primarily educational or recreational and when taken collectively contribute toward reducing the numbers of mosquitoes; (2) "Control Projects," including map making, breeding site location and plotting, and collecting and identifying flying mosquitoes; and (3) "Research Projects," fostering the development of better control methods for local conditions by emphasizing the sampling of mosquito populations in such a way that meaningful descriptions and predictions can be made of the effects of control methods. (ERIC)

ERIC NUMBER: ED207797
EDRS PRICE: PC05 Plus Postage.

AUTHOR: Hollums, Don
YEAR: 1970
LENGTH: 7 p.
DESCRIPTORS: Camping--; Conservation-Education; Facility-Improvement; Instructional-Improvement; Natural-Resources; Recreation--; Educational-Programs;
ABSTRACT: The document describes how outdoor education in the Bloomfield Hills School District of Michigan can be traced to 1957, when elementary school students participated in a resident outdoor school experience for a week. In 1968, a committee on outdoor education was formally organized. The committee developed a rationale and objectives for outdoor education for the Bloomfield Hills schools. The broad objective topics which provide the rationale are: (1) an appreciation of natural resources; (2) improved instruction in science, language, arts, social studies; (3) development of recreational skills in the outdoors; (4) social experience; (5) community service; and (6) aesthetic awareness. In the document, it is noted that the outdoor/conservation education program and facilities are essential to this community, since the city has no public parks or recreation areas, and the school sites must serve as neighborhood parks. Future plans relate to youth involvement in the development of facilities, the development of a school garden-farm program, and informing patrons of the school district as to program progress. (ERIC)

ERIC NUMBER: ED046566
EDRS PRICE: PC01 Plus Postage.
AUTHOR: James, Howard-G.
TITLE: School and Community Involvement in a High School Biology Museum
SOURCE: Science-Teacher; 40; 7; 42-44 (1973)
DESCRIPTORS: Community-Involvement; Science-Education; Student-Volunteers; Biology-Museums; Science-Activities; Science-Facilities; Secondary-School-Science
ABSTRACT: Describes the establishment of a high school museum and outlines the value of student and community involvement in maintaining and building the collection. Students are enthusiastic in collecting, preserving, and identifying specimens, and volunteer as museum assistants. (ERIC)

AUTHOR: Kenney, Marianne
TITLE: Geography and Mutual Understanding: "Harvest of Hope."
SOURCE: Journal-of-Geography; v91 n4 p177-85 Jul-Aug 1992
DESCRIPTORS: Agriculture; Cultural-Differences; Geography-Instruction; Public-Service; Science-Education
ABSTRACT: Describes "Harvest of Hope," a project for science and geography instruction in which students from an inner-city and a suburban school joined in a community service project. Explains that the students planned, planted, and harvested crops for the needy on school property. Includes handouts simulating international negotiations, trade agreements, and planning. (ERIC)

AUTHOR: Kiernan, Henry
TITLE: Teaching Civic Identity and Civic Writing in the Information Age.
YEAR: 1990
LENGTH: 14 p.
DESCRIPTORS: Citizenship-Responsibility; Community-Relations; Global-Approach; High-Schools; High-School-Students; Local-Issues; School-Districts; Teaching-Methods; Writing-Assignments; Citizenship-Education; Consciousness-Raising; Interdisciplinary-Approach; Multicultural-Education; Research-Skills; Student-Research
ABSTRACT: Given the increasingly multi-ethnic school population and the lack of democratic political traditions in many students' cultural backgrounds, new ways to educate for citizenship are essential. The paper recommends developing multidisciplinary approaches to teaching civic identity and civic writing. It describes how a New Jersey school district introduced civic writing activities directly linked to local history and community issues, combining public and individual experiences with high school student commitment. The planning team agreed that the English, social studies, and science departments would work cooperatively to assess student research writing. They considered: topics that would address ways to build a sense of community within the student body; ways to develop participatory and responsible civic behavior; and methods of teaching skills, values, and attitudes to prepare students for the future. The multidisciplinary themes they chose were environmental issues, local history, and multicultural studies and global issues. Besides completing question-driven research projects, students were encouraged to participate in local community service projects. The article offers nine recommendations to help transform the current research process that relies on thesis writing into a viable question-driven design. It suggests that combining academic discourse with community service provides the social and political glue to enhance students' personal development with civic responsibility. (ERIC)

ERIC NUMBER: ED348340
EDRS PRICE: PC01 Plus Postage.
Author: Schine, Joan et al.
Title: New Roles for Early Adolescents in Schools and Communities.
Year: 1981
Length: 60 p.
Institution: National Commission on Resources for Youth, Inc., 36 West 44th St., New York, NY 10036 ($5.00).

Abstract: This booklet is intended to stimulate new interest in the need of young adolescents to take on meaningful roles and to help planners and practitioners to translate that interest into youth participation programs. There are three major sections. Section I examines the special needs and characteristics of youth in the 10 to 14 age group. Discussed is how youth participation programs can offer almost endless possibilities for meeting the specific needs of early adolescence. The role of the adult leader in facilitating programs is also examined. To provide ideas and examples for those wanting to start their own youth participation programs, section II presents five case studies: a Community Service and Career Exploration Program in Shoreham, New York; a Peer Tutoring Program in Indianapolis, Indiana; a GUTS (Government Understanding for Today's Students) program in Bronx, New York; a Cooperative Science Education Program in New York City; and a Junior Historian Club in Ahoskie, North Carolina. Implementation is the focus of section III. Discussed are program components, practical guidelines for starting a program, the role of the adult facilitator, and tips for working with community resource people. Recommendations from a practitioner are also presented. Appendices contain brief sketches of additional programs, the addresses and contact people for the programs described in section II, a bibliography of resources, and a listing of the publications of the National Commission on Resources for Youth. (ERIC)

Descriptors: Career-Education; Intermediate-Grades; Local-History; Peer-Teaching; Problem-Solving; School-Community-Programs; Science-Education; Secondary-Education; Student-Participation; Adolescents-; Community-Involvement; Program-Development; Program-Implementation; School-Involvement

ERIC Number: ED220351 (PC Not Available from EDRS)

Title: Student Project Work and Abstracts. Beaufort, North Carolina Environmental Studies Project, No. 1.
Year: 1973
Institution: Carteret County Board of Education, Beaufort, N.C.
Descriptors: Community-Cooperation; Community-Involvement; School-Community-Relationship; Secondary-School-Science; Student-Developed-Materials

Abstract: This collection contains reports of 22 environmental study projects conducted by junior and senior students in a North Carolina high school. The scope of the projects covered total community service and sought to emphasize the students' roles as useful participants in the community. Fire, postal, health, and school services were surveyed, in addition to such environmental concerns as salt marsh conservation and food production. (ERIC)

ERIC Number: ED086495
EDRS Price: PC04 Plus Postage.
Zamm, Michael

Training Student Organizers Curriculum, Revised Edition.

1990

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Council on the Environment of New York City, 51 Chambers Street, Room 228, New York, NY 10007 ($15.00).

Activism-; Community-Involvement; Conservation-Education; Elementary-Secondary-Education; Science-Education; Student-Leadership; Teaching-Guides; Elementary-School-Science; Environmental-Education; Leadership-Training; Learning-Activities; Secondary-School-Science

Between 1979 and June 1990, the Training Student Organizers (TSO) Program has motivated nearly 7,400 students and their teachers to organize over 260 environmental improvement projects serving their schools and neighborhoods in the New York City area. The projects run the gamut from clean up campaigns, murals, and letter writing efforts to energy conservation. This document presents the curriculum from the TSO Program including lessons on many topics including energy conservation, solid wastes, water, air, open space beautification and preservation, noise pollution, nuclear energy, and transportation; and teaching suggestions and process goals including "The Rationale for Citizen Participation," "Needs Assessment and Project Selection," "Project Planning and Initial Field Organizing," "Project Monitoring and Ongoing Participation Strategies," "Evaluation," and "Letter Writing and Petitioning." (ERIC)

ED328424 (PC Not Available from EDRS)