

DOCUMENT RESUME

ED 021 774

SE 005 050

SCIENCE EDUCATION INFORMATION REPORT, GENERAL BIBLIOGRAPHY SERIES 9, EVALUATION, EDUCATIONAL OBJECTIVES, LEARNING THEORIES AND PROCESSES, RESEARCH METHODOLOGY.

ERIC Information Analysis Center for Science Education, Columbus, Ohio.

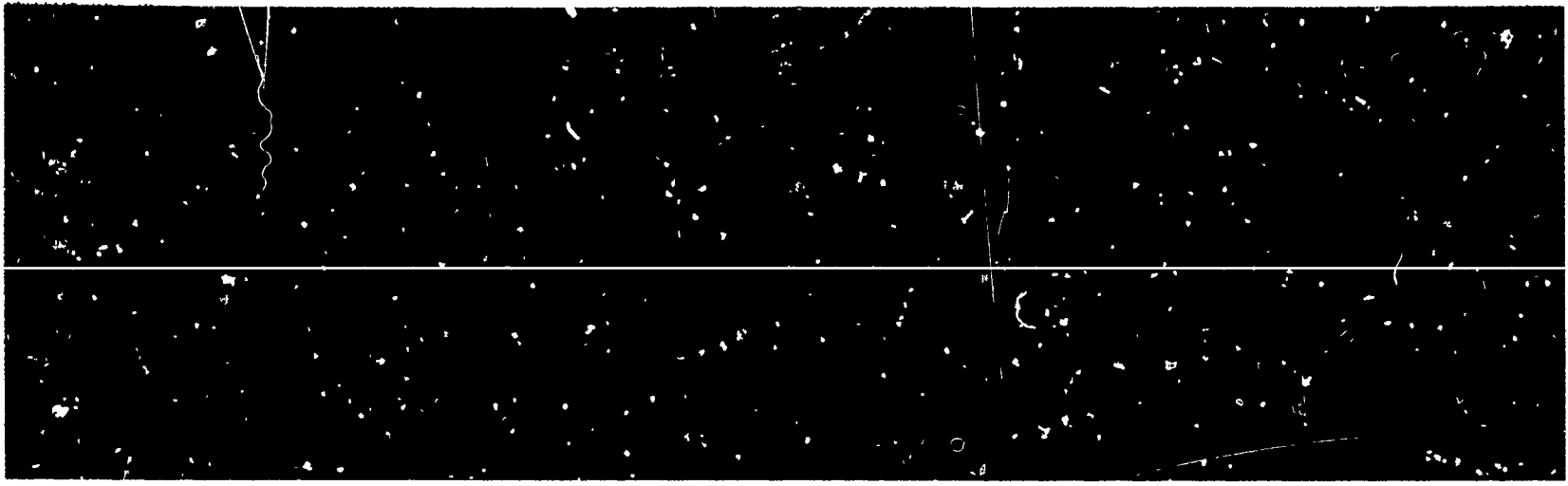
Pub Date May 68

Note- 33p.

EDRS Price MF-\$0.25 HC-\$1.40

Descriptors- ACHIEVEMENT, COGNITIVE DEVELOPMENT, COLLEGE SCIENCE, CONCEPT FORMATION, CREATIVITY, CRITICAL THINKING, DOCTORAL THESES, \*EDUCATIONAL OBJECTIVES, \*EDUCATIONAL RESEARCH, ELEMENTARY SCHOOL SCIENCE, \*EVALUATION, INTERACTION PROCESS ANALYSIS, \*LEARNING, PROBLEM SOLVING, RESEARCH METHODOLOGY, \*SCIENCE EDUCATION, SECONDARY SCHOOL SCIENCE, TEACHER EDUCATION, TESTS

This is the ninth in a series of general bibliographies which are being developed to disseminate information concerning documents analyzed at the ERIC Information Analysis Center for Science Education. Reported are over 100 citations to selected documents in the areas of (1) evaluation, (2) educational objectives, (3) learning theories and processes, and (4) research methodology. The documents include research reports, research reviews, conference reports, project reports, position papers, textbooks, and speeches. The citations are categorized under the major areas in alphabetical order by author and indicate the availability and major ideas of the document. General bibliographies have been or are being prepared for other selected areas in science education. All bibliographies will be supplemented periodically as more documents are processed by the ERIC Information Analysis Center for Science Education. (DS)



**General Bibliography Series  
Bibliography 9  
Evaluation and Educational Objectives  
Learning Theories and Processes  
Research Methodology**

**U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE  
OFFICE OF EDUCATION**

**THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE  
PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS  
STATED DO NOT NECESSARILY REPRESENT OFFICIAL OFFICE OF EDUCATION  
POSITION OR POLICY.**

**SEIAC/SCIENCE EDUCATION INFORMATION ANALYSIS CENTER**  
... an information center to organize and disseminate information and materials on science education to teachers, administrators, supervisors, researchers, and the public. A joint project of The Ohio State University and the Educational Resources Information Center of USOE.

ED021774

050 005 050

# SCIENCE EDUCATION INFORMATION REPORT

**General Bibliography Series  
Bibliography 9**

**Evaluation and Educational Objectives  
Learning Theories and Processes  
Research Methodology**

**ERIC Information Analysis Center  
for Science Education  
1460 West Lane Avenue  
Columbus, Ohio 43221**

**May, 1968**

# BIBLIOGRAPHY 9

| <b>Table of Contents</b>               | <b>Page</b> |
|--|-------------|
| <b>Evaluation</b>                      | <b>1</b>    |
| <b>Educational Objectives</b>          | <b>9</b>    |
| <b>Learning Theories and Processes</b> | <b>19</b>   |
| <b>Research Methodology</b>            | <b>25</b>   |

# SCIENCE EDUCATION INFORMATION REPORTS

The Science Education Information Reports are being developed to disseminate information concerning documents analyzed at the ERIC Information Analysis Center for Science Education. The Reports include five types of publications. *General Bibliographies* are being issued to announce most documents processed by the Information Analysis Center for Science Education. These bibliographies are categorized by topics and indicate the availability of the document and the major ideas included in the document. *Special Bibliographies* are being developed to announce availability of documents in selected interest areas. These bibliographies will list most significant documents that have been published in the interest area. *Guides to Resource Literature for Science Teachers* are bibliographies that identify references for the professional growth of teachers at all levels of science teaching. This series will include six separate publications. *State-of-the-Art Papers* will be issued periodically to indicate implications of research for science teaching. *Research Reviews* will be issued to analyze and synthesize research related to science education over a period of several years.

*The Science Education Information Reports* will be announced in the *SEIAC Newsletter* as they become available.

## GENERAL BIBLIOGRAPHIES

The *General Bibliographies* are being developed to announce the documents acquired and processed by the ERIC Information Analysis Center for Science Education. The bibliographies will focus on general topics. This bibliography announces most documents related to the topic that were included in the first 2,000 documents processed by this Center. Supplements will be issued as documents are processed.

## USING BIBLIOGRAPHIC CITATIONS

All documents are listed by similar bibliographic citations. A sample citation is explained for your convenience. You will find it helpful to study the explanation of the sample citation before using this bibliography.

## SAMPLE OF BIBLIOGRAPHIC CITATION

---

(1) SE 001 505      (2) 07 12 67      (3) 20 86 29      (4) 1      (5) 00 000 004  
(6) KLOPPER, LEOPOLD E.  
(7) THE USE OF CASE HISTORIES IN SCIENCE TEACHING  
(8) SCHOOL SCIENCE AND MATHEMATICS  
(9) 11 00 64      (10) 4  
(11) \*BIOLOGY, \*CHEMISTRY, \*SCIENCE HISTORY, \*PHYSICS, \*SCIENCE  
CASE HISTORIES, \*SECONDARY SCHOOL SCIENCE, \*TEACHING TECH-  
NIQUES, PROGRAM DESCRIPTIONS

---

## EXPLANATION OF BIBLIOGRAPHIC CITATION

(1) (SE 001 505)

This is the Science Education Center's identification number for the document. It serves as the name for the document and our way of locating the material.

(2) (07 12 67)

The second field contains the date the citation was typed at our Center (July 12, 1967).

(3) (20 86 29)

Field three is a code for developing bibliographies. By using this code several kinds of bibliographies can be structured by retrieval specialists or by computer programs.

(4) 1

This field indicates the level of processing of the document.

1--cataloged and indexed

2--cataloged, indexed, and annotated or abstracted

3--announced in *Research in Education*

(5) (00 000 004)

The source of the document has also been coded for computer search. This number identifies where the document can be obtained. It usually designates the same source as field seven.

(6) KLOPPER, LEOPOLD E.

The principal author, editor, or organization associated with the writing of the document is listed.

(7) THE USE OF CASE HISTORIES IN SCIENCE TEACHING

Title of the document.

(8) SCHOOL SCIENCE AND MATHEMATICS

This indicates where the document was obtained by the Center.

(9) (11 00 64)

This field designates the publication date of the document (November, 1964). The first set of two numerics represents the month; the second, the day of the month; and the third, the year. In most cases the date is obtained from the document. In a few cases, when no date of publication is on the document, the date is estimated based on the best information available in the document.

(10) 4

Field ten identifies the number of pages in the document. This document contains four pages. Use of this field will provide information concerning the length of the document.

(11) \*BIOLOGY, \*CHEMISTRY, \*SCIENCE HISTORY, \*PHYSICS, \*SCIENCE CASE HISTORIES, \*SECONDARY SCHOOL SCIENCE, \*TEACHING TECHNIQUES, PROGRAM DESCRIPTIONS

This field provides an indication of the ideas included in the document. Each term, such as \*BIOLOGY, has been selected by an information analyst because the term is important for the identification of the document. Terms marked with an asterisk represent primary ideas in the document; the other terms represent ideas of lesser importance. You can use this information to narrow the number of documents you want to review.

# EVALUATION

1. SE 000 591 06 01 67 04 15 15 1 51 000 292  
CUEBS  
THREE-DIMENSIONAL GRID FOR TEST ITEM CATEGORIZATION  
CUEBS, GEORGE WASHINGTON UNIVERSITY, WASHINGTON, D. C.  
12 00 65 1  
\*BIOLOGY, \*EVALUATION, \*TEST CONSTRUCTION
  
2. SE 001 051 07 24 67 04 86 40 1 00 000 006  
CUNNINGHAM, JOHN D.  
INTERACTION ANALYSIS - A USEFUL TECHNIQUE FOR RESEARCH AND  
SCIENCE SUPERVISION  
SCIENCE EDUCATION  
02 00 67 3  
\*EVALUATION, \*INTERACTION ANALYSIS, \*RESEARCH TECHNIQUES, \*SCIENCE  
SUPERVISION, INSTRUCTIONAL EVALUATION, SCIENCE TEACHERS, TEACHER  
EFFECTIVENESS, FLANDERS SCALE FOR INTERACTION ANALYSIS, AMIDON'S  
SYSTEM OF INTERACTION ANALYSIS
  
3. SE 000 166 07 19 67 04 72 17 2 00 000 006  
D'AMBROSIO, NICHOLAS  
ONE METHOD OF EVALUATING A SCIENCE COURSE  
SCIENCE EDUCATION  
10 00 66 3  
\*EVALUATION, \*GENERAL SCIENCE, \*TESTING, SECONDARY SCHOOL SCIENCE,  
COURSE EVALUATION, GRADE 9, 1958, EASTSIDE HIGH SCHOOL, PATERSON,  
NEW JERSEY
  
4. SE 000 001 09 13 67 04 23 17 2 00 000 008  
DELOACH, WILL S.  
ORGANIC CHEMISTRY TESTS - AN ANALYSIS  
JOURNAL OF RESEARCH IN SCIENCE TEACHING  
64 57  
\*CHEMISTRY, \*COLLEGE SCIENCE, \*EVALUATION, \*ORGANIC CHEMISTRY, \*TEST  
CONSTRUCTION, ITEM ANALYSIS, RESEARCH REPORTS, GEORGE PEABODY  
COLLEGE FOR TEACHERS



5. SE 001 934 08 29 67 04 91 17 2 22 000 319  
 ESGET, MILES HARVEY  
 DEVELOPING AND USING AN OBJECTIVE INSTRUMENT TO MEASURE STUDENT  
 GROWTH IN COLLEGE ELEMENTARY SCHOOL SCIENCE COURSES  
 UNIVERSITY MICROFILMS, ANN ARBOR, MICHIGAN  
 58 150  
 \*ELEMENTARY SCHOOL TEACHERS, \*ELEMENTARY SCHOOL SCIENCE, \*TEACHING  
 METHODS, \*EVALUATION, \*TEACHER EDUCATION, ACHIEVEMENT, COURSE  
 CONTENT, COLLEGE SCIENCE, RESEARCH REPORTS, TESTING, 1958, PRESERVICE  
 TEACHERS
6. SE 000 181 07 05 67 04 12 38 1 00 000 001  
 FAKIER, EDWIN L.  
 EDUCATION IN HIGH SCHOOL BIOLOGY  
 THE AMERICAN BIOLOGY TEACHER  
 10 00 66 1  
 \*BIOLOGY, \*EVALUATION, \*SECONDARY SCHOOL SCIENCE
7. SE 000 825 06 27 67 04 11 17 1 00 000 008  
 HANEY, RICHARD E.  
 THE DEVELOPMENT OF A NONVERBAL TEST OF CHILDREN'S CONCEPTS OF  
 ANIMALS  
 JOURNAL OF RESEARCH IN SCIENCE TEACHING  
 09 00 65 6  
 \*CONCEPT FORMATION, \*ELEMENTARY SCHOOL SCIENCE, \*NONVERBAL TESTS,  
 \*STUDENT EVALUATION, \*TEST CONSTRUCTION, RESEARCH REPORTS, STECK  
 SCIENCE SERIES, STECK COUNTY, TEXAS, RACINE, WISCONSIN, WAUSAU, BIOLOGY
8. SE 001 044 09 27 67 04 22 29 1 00 000 007  
 HENDRICKSON, CHARLES W.  
 YOUR ACS-NSTA HIGH SCHOOL CHEMISTRY TESTING PROGRAM  
 THE SCIENCE TEACHER  
 02 00 67 2  
 \*ACHIEVEMENT TESTS, \*CHEMISTRY, \*EVALUATION, \*SECONDARY SCHOOL  
 SCIENCE, \*TESTS, TEST CONSTRUCTION, AMERICAN CHEMICAL SOCIETY,  
 NATIONAL SCIENCE TEACHERS ASSOCIATION

9. SE 001 064 08 22 67 04 23 17 2 00 000 008  
 HERRON, J. DUDLEY  
 EVALUATION AND THE NEW CURRICULA  
 JOURNAL OF RESEARCH IN SCIENCE TEACHING  
 09 00 66 6  
 \*CHEMISTRY, \*RESEARCH REPORTS, \*SECONDARY SCHOOL SCIENCE, \*ACADEMIC  
 ACHIEVEMENT, CURRICULUM DEVELOPMENT, EVALUATION METHODS, STUDENT  
 ABILITIES, STUDENT TESTING, IOWA TESTS OF EDUCATIONAL DEVELOPMENT,  
 WATSON-GLASER CRITICAL THINKING APPRAISAL, TAXONOMY OF EDUCATIONAL  
 OBJECTIVES
10. SE 000 136 08 25 67 04 22 37 2 00 000 003  
 HINCKLEY, C. C. AND LAGOWSKI, J. J.  
 A VERSATILE COMPUTER-GRADED EXAMINATION  
 JOURNAL OF CHEMICAL EDUCATION  
 11 00 66 3  
 \*COMPUTER-ASSISTED EVALUATION, \*COLLEGE SCIENCE, \*CHEMISTRY, \*STUDENT  
 EVALUATION, \*EVALUATION
11. SE 001 123 07 10 67 04 23 20 1 09 000 229  
 JEFFREY, JACK AND WESTMEYER, PAUL  
 OBJECTIVES OF THE CHEMISTRY LABORATORY AND MEANS FOR MEASURING  
 ACHIEVEMENT (PRESENTED AT NARST MEETING)  
 FLORIDA STATE UNIVERSITY, TALLAHASSEE  
 02 00 66 35  
 \*CHEMISTRY, \*EDUCATIONAL OBJECTIVES, \*EVALUATION, \*SCIENCE ACTIVITIES,  
 \*ACADEMIC ACHIEVEMENT, COLLEGE SCIENCE, RESEARCH REPORTS, PAPERS,  
 NATIONAL ASSOCIATION FOR RESEARCH IN SCIENCE TEACHING
12. SE 000 715 07 21 67 04 81 17 1 32 000 253  
 JONES, HOWARD L. AND OTHERS  
 TEACHERS' RATINGS OF STUDENTS STUDYING IN CONTRASTING SCIENCE  
 CURRICULA  
 SYRACUSE UNIVERSITY, NEW YORK  
 02 00 67 8  
 \*ABILITY GROUPING, \*EVALUATION TECHNIQUES, \*EVALUATION, \*PROBLEM  
 SOLVING, \*STUDENT EVALUATION, STUDENT GROUPING, RESEARCH REPORTS,  
 SCIENCE - A PROCESS APPROACH (AAAS PUBLICATION)

13. SE 001 659 09 12 67 04 33 03 3 00 000 002  
 KRUGLAK, HAYM  
 RESOURCE LETTER AT-1 ON ACHIEVEMENT TESTING  
 AMERICAN JOURNAL OF PHYSICS  
 04 00 65 8  
 \*ACHIEVEMENT, \*BIBLIOGRAPHIES, \*COLLEGE SCIENCE, \*EVALUATION, \*PHYSICS,  
 \*STUDENT EVALUATION, ACHIEVEMENT TESTS, ESSAY TESTS, EDUCATIONAL  
 OBJECTIVES, STANDARDIZED TESTS, TEST CONSTRUCTION, AMERICAN INSTITUTE  
 OF PHYSICS, AMERICAN ASSOCIATION OF PHYSICS TEACHERS, NATIONAL SCIENCE  
 FOUNDATION, RESOURCE LETTERS, TESTS
14. SE 001 188 08 17 67 04 32 38 1 00 000 009  
 KRUGLAK, HAYM  
 TESTING FOR ACHIEVEMENT IN PHYSICS  
 THE PHYSICS TEACHER  
 05 00 66 4  
 \*EVALUATION, \*PHYSICS, \*SECONDARY SCHOOL SCIENCE, \*TEST CONSTRUCTION,  
 ACADEMIC ACHIEVEMENT, ACHIEVEMENT TESTS, BIBLIOGRAPHIES, TESTS
15. SE 000 510 07 24 67 04 86 38 1 00 000 004  
 LITTLE, ELLIS BEECHER  
 CREATIVITY AND THE CORRECTION-FOR-CHANCE-SUCCESS FORMULA  
 SCHOOL SCIENCE AND MATHEMATICS  
 01 00 67 6  
 \*CREATIVITY, \*EVALUATION, TESTING TECHNIQUES, FLANAGAN TEST OF INGEN-  
 UITY, AMERICAN COLLEGE TEST, CORRECTION-FOR-CHANCE-SUCCESS FORMULA
16. SE 001 966 09 05 67 04 53 17 2 22 000 000  
 MALONE, WILLIAM HOWARD  
 THE CONSTRUCTION AND USE OF A TEST OF PHYSICAL SCIENCE AS IT IS  
 OFFERED IN THE STATE TEACHERS COLLEGES OF MASSACHUSETTS  
 UNIVERSITY MICROFILMS, ANN ARBOR, MICHIGAN  
 59 143  
 \*EVALUATION, \*COLLEGE SCIENCE, \*PHYSICAL SCIENCES, \*TEST CONSTRUCTION,  
 ACHIEVEMENT, RESEARCH REPORTS, TESTING, TEST STANDARDIZATION, 1957,  
 1958, STATE TEACHERS COLLEGES, MASSACHUSETTS

17. SE 001 968 09 05 67 04 22 17 2 22 000 319  
 MAX, HERBERT JOHN  
 THE DEVELOPMENT OF AN INSTRUMENT TO MEASURE AN ASPECT OF CRITICAL  
 THINKING IN THE AREA OF HIGH SCHOOL CHEMISTRY  
 UNIVERSITY MICROFILMS, ANN ARBOR, MICHIGAN  
 54 98  
 \*CHEMISTRY, \*CRITICAL THINKING, \*EVALUATION, \*SECONDARY SCHOOL SCIENCE,  
 \*TESTING, RESEARCH REPORTS, TEST CONSTRUCTION, TEST STANDARDIZATION,  
 TESTS, 1954
18. SE 001 971 09 12 67 04 73 17 2 22 000 319  
 MONAGHAN, FLOYD VERANUS  
 THE EFFECT OF DELAY OF KNOWLEDGE OF TEST RESULTS ON LEARNING IN A  
 NATURAL SCIENCE COURSE  
 UNIVERSITY MICROFILMS, ANN ARBOR, MICHIGAN  
 61 88  
 \*ACHIEVEMENT, \*COLLEGE SCIENCE, \*RESEARCH REPORTS, \*RETENTION, \*TEST-  
 ING, TEACHING METHODS, NATURAL SCIENCE COURSE #782, MICHIGAN STATE  
 UNIVERSITY, EAST LANSING, 1961
19. SE 000 883 08 28 67 04 85 11 2 00 000 179  
 NEDELSKY, LEO  
 SCIENCE TEACHING AND TESTING  
 HARCOURT, BRACE, AND WORLD  
 65 368  
 \*EDUCATIONAL OBJECTIVES, \*EVALUATION METHODS, \*EVALUATION, \*TEST  
 CONSTRUCTION, TEACHING METHODS
20. SE 000 651 06 05 67 04 12 12 1 35 000 200  
 OHIO STATE DEPARTMENT OF EDUCATION  
 BIOLOGY - FINAL DISTRICT-STATE CONTEST  
 OHIO STATE DEPARTMENT OF EDUCATION  
 05 00 66 8  
 \*ACHIEVEMENT TESTS, \*BIOLOGY, \*SECONDARY SCHOOL SCIENCE, MULTIPLE  
 CHOICE TEST ITEMS, OBJECTIVE TEST ITEMS, \*TESTS
21. SE 000 652 06 05 67 04 22 12 1 35 000 200  
 OHIO STATE DEPARTMENT OF EDUCATION  
 CHEMISTRY FINAL DISTRICT-STATE CONTEST  
 OHIO STATE DEPARTMENT OF EDUCATION  
 05 00 66 8  
 \*ACHIEVEMENT TESTS, \*CHEMISTRY, \*MULTIPLE CHOICE TEST ITEMS, \*SECON-  
 DARY SCHOOL SCIENCE, OBJECTIVE TEST ITEMS, \*TESTS

22. SE 000 653 06 05 67 04 72 12 1 35 000 200  
 OHIO STATE DEPARTMENT OF EDUCATION  
 GENERAL SCIENCE FINAL DISTRICT-STATE CONTEST  
 OHIO STATE DEPARTMENT OF EDUCATION  
 05 00 66 7  
 \*ACHIEVEMENT, \*GENERAL SCIENCE, \*SECONDARY SCHOOL SCIENCE, \*TESTS
23. SE 000 659 06 13 67 04 32 12 1 35 000 200  
 OHIO STATE DEPARTMENT OF EDUCATION  
 PHYSICS - FINAL DISTRICT-STATE CONTEST  
 OHIO STATE DEPARTMENT OF EDUCATION  
 05 00 66 8  
 \*EVALUATION, \*PHYSICS, \*SECONDARY SCHOOL SCIENCE, \*TESTS, INSTRUCTIONAL MATERIALS, OHIO TESTING SERVICES, COLUMBUS, OHIO
24. SE 001 935 09 27 67 04 86 12 2 22 000 319  
 PERISHO, CLARENCE ROBERT  
 A PROBLEM-SOLVING TEST - THE CONSTRUCTION OF A MANIPULATIVE PERFORMANCE TEST DESIGNED TO INDUCE THE COLLECTION AND USE OF RECEPTIVE DATA IN THE FORMULATION AND INFERENCE. . . . .  
 UNIVERSITY MICROFILMS, ANN ARBOR, MICHIGAN  
 63 193  
 \*EVALUATION, \*COLLEGE SCIENCE, \*PROBLEM SOLVING, \*RESEARCH REPORTS, \*TESTS, TEACHING METHODS, ACE PSYCHOLOGICAL EXAMINATION, SRA PRIMARY MENTAL ABILITIES TESTS, COOPERATIVE READING COMPREHENSION TESTS, KUDER PREFERENCE RECORD - VOCATIONAL, 1963
25. SE 000 309 08 21 67 04 95 20 1 00 000 007  
 ROSENGREN, JOHN H.  
 EXTRA WORK (CREDIT) - FOR WHOM?  
 THE SCIENCE TEACHER  
 09 00 66 3  
 \*ORAL EXAMINATIONS, \*STUDENT ASSIGNMENTS, \*SECONDARY SCHOOL SCIENCE, \*STUDENT EVALUATION, \*TEACHING TECHNIQUES, BIOLOGY, EVALUATION
26. SE 000 167 07 12 67 04 93 17 1 00 000 006  
 SCALES, ELDRIDGE E.  
 VARIABILITY IN GRADING PRACTICES OF INSTRUCTORS OF A MULTIPLE SECTION NATURAL SCIENCE COURSE  
 SCIENCE EDUCATION  
 10 00 66 4  
 \*BIOLOGY, \*EVALUATION, GRADING (ACADEMIC), \*COLLEGE SCIENCE, 1955, 1956, FORT VALLEY STATE COLLEGE, FORT VALLEY, GEORGIA, UNDERGRADUATES

27. SE 000 893 07 19 67 04 55 17 3 00 000 006  
 SIMPSON, RAY H.  
 SELF-EVALUATION BY PHYSICAL SCIENCE INSTRUCTORS  
 SCIENCE EDUCATION  
 02 00 66 7  
 \*COLLEGE SCIENCE, \*EVALUATION, \*PHYSICAL SCIENCES, \*SELF-EVALUATION,  
 \*TEACHER IMPROVEMENT, EVALUATION METHODS, EVALUATION TECHNIQUES,  
 TEACHER RATING, RESEARCH REPORTS
28. SE 000 050 08 18 67 04 86 20 2 00 000 008  
 SMITH, GARY R.  
 ANALYZING TEST RESPONSES WITH SYMBOLIC LOGIC  
 JOURNAL OF RESEARCH IN SCIENCE TEACHING  
 66 6  
 \*EVALUATION TECHNIQUES, \*EVALUATION, \*SYMBOLIC LOGIC, PHYSICAL  
 SCIENCES, STUDENT EVALUATION, COOPERATIVE RESEARCH PROJECT, U. S.  
 OFFICE OF EDUCATION
29. SE 000 756 07 21 67 04 81 11 3 51 000 241  
 TANNENBAUM, HAROLD E. AND OTHERS  
 EVALUATION IN ELEMENTARY SCHOOL SCIENCE  
 U. S. GOVERNMENT PRINTING OFFICE  
 64 75  
 \*CURRICULUM EVALUATION, \*EVALUATION, \*ELEMENTARY SCHOOL SCIENCE,  
 \*EDUCATIONAL OBJECTIVES, INSTRUCTION, INSERVICE TEACHER EDUCATION,  
 SCIENCE TESTS, SUPERVISION, SELF-EVALUATION, STUDENT EVALUATION, TEST  
 CONSTRUCTION, TEACHER EVALUATION, TEACHER EFFECTIVENESS, TEXTBOOK  
 EVALUATION, U. S. OFFICE OF EDUCATION
30. SE 000 034 06 27 67 04 95 29 3 00 000 007  
 TYLER, RALPH W.  
 ASSESSING THE PROGRESS OF EDUCATION IN SCIENCE  
 THE SCIENCE TEACHER  
 09 00 66 4  
 \*EDUCATIONAL OBJECTIVES, \*EVALUATION, \*SCIENTIFIC LITERACY, \*SCIENCE  
 EDUCATION, ADULT EDUCATION, ATTITUDES, COLLEGE SCIENCE, ELEMENTARY  
 SCHOOL SCIENCE, SCIENTIFIC ATTITUDES, SECONDARY SCHOOL SCIENCE

31. SE 001 010 07 28 67 04 13 38 2 00 000 001  
WEST, LUTHER S. AND KOPENSKI, MARTIN  
DOES PLACARD TESTING HAVE A PLACE?  
THE AMERICAN BIOLOGY TEACHER  
05 00 62 3  
\*BIOLOGY, \*COLLEGE SCIENCE, \*EVALUATION, \*ZOOLOGY, JUNIOR COLLEGES,  
LABORATORY TESTS, TESTING
32. SE 000 027 08 16 67 04 22 12 3 00 000 008  
WINTER, S. S. AND OTHERS  
COOPERATIVE DEVELOPMENT OF LOCALLY ORIENTED ACHIEVEMENT TESTS IN  
CHEMISTRY  
JOURNAL OF RESEARCH IN SCIENCE TEACHING  
06 00 66 7  
\*ACHIEVEMENT TESTS, \*CHEMISTRY, \*COGNITIVE DEVELOPMENT, \*STUDENT  
EVALUATION, \*SECONDARY SCHOOL SCIENCE, \*EVALUATION, TEST CONSTRUC-  
TION, BLOOM'S TAXONOMY OF EDUCATIONAL OBJECTIVES, REGENTS CHEMISTRY  
EXAMINATION

# EDUCATIONAL OBJECTIVES

1. SE 000 172 07 14 67 09 82 20 1 00 000 006  
ARTHUR, E. FOSTER  
SCIENCE AND INDUSTRIAL ARTS  
  
SCIENCE EDUCATION  
10 00 66 7  
\*INDUSTRIAL ARTS EDUCATION, \*METAL WORK, \*TEACHING AIDS, SECONDARY SCHOOL SCIENCE, HEAT TREATING, SCIENCE EDUCATION, 1966, RALEIGH, NORTH CAROLINA, \*OBJECTIVES
  
2. SE 000 906 08 22 67 09 86 18 1 00 000 006  
AYLESWORTH, THOMAS G.  
THE NEED FOR PROBLEM SOLVING  
  
SCIENCE EDUCATION  
03 00 65 7  
\*EDUCATIONAL OBJECTIVES, \*LEARNING THEORY, \*PROBLEM SOLVING, \*REASONING, \*SCIENTIFIC METHOD, \*SCIENCE EDUCATION, TEACHING METHODS, BIBLIOGRAPHIES, DEDUCTIVE REASONING, INDUCTIVE REASONING
  
3. SE 000 400 09 05 67 09 86 19 2 00 000 007  
BARNARD, J. DARRELL  
WHAT CAN SCIENCE CONTRIBUTE TO THE LIBERAL EDUCATION OF ALL CHILDREN?  
  
THE SCIENCE TEACHER  
11 00 65 3  
\*EDUCATIONAL OBJECTIVES, \*GENERAL EDUCATION, \*SCIENCE EDUCATORS, CURRICULUM DEVELOPMENT, SPEECHES, TEACHER EDUCATION, NEW YORK
  
4. SE 000 754 08 25 67 09 35 06 3 00 000 220  
BROWN, SANBORN C. AND OTHERS  
WHY TEACH PHYSICS  
  
AMERICAN INSTITUTE OF PHYSICS  
64 97  
\*CURRICULUM DEVELOPMENT, \*EDUCATIONAL OBJECTIVES, \*PHYSICS, SECONDARY SCHOOL SCIENCE, ATOMIC PHYSICS, INTERNATIONAL EDUCATION, SCIENCE ACTIVITIES, MODERN PHYSICS, SCIENCE EQUIPMENT, SCIENCE HISTORY, SOCIO-ECONOMIC INFLUENCES, INTERNATIONAL UNION OF PURE AND APPLIED PHYSICS



5. SE 001 957 09 05 67 09 91 17 2 22 000 319  
 BRYANT, PAUL PAYNE  
 SCIENCE UNDERSTANDINGS CONSIDERED IMPORTANT FOR CHILDREN AND THE  
 SCIENCE REQUIRED OF ELEMENTARY SCHOOL TEACHERS  
 UNIVERSITY MICROFILMS, ANN ARBOR, MICHIGAN  
 59 289  
 \*COURSE CONTENT, \*ELEMENTARY SCHOOL SCIENCE, \*TEACHER EDUCATION,  
 CURRICULUM, ELEMENTARY SCHOOL TEACHERS, CONCEPTS, COLLEGE SCIENCE,  
 PRESERVICE TEACHERS, RESEARCH REPORTS, 1959
6. SE 000 410 08 22 67 09 95 20 2 00 000 010  
 CARLETON, ROBERT H.  
 EDITORIAL  
 SCIENCE AND CHILDREN  
 10 00 65 1  
 \*EDUCATIONAL OBJECTIVES, \*ELEMENTARY SCHOOL SCIENCE, \*GENERAL EDU-  
 CATION, \*SCIENTIFIC LITERACY, \*SECONDARY SCHOOL SCIENCE, APPLIED SCIENCES,  
 CRITICAL THINKING, COLLEGE SCIENCE, TEACHING METHODS, EDITORIALS
7. SE 000 380 08 21 67 09 12 20 1 00 000 007  
 CHASE, GRAFTON D.  
 SHOULD MICROBIOLOGY OR RADIOISOTOPES BE A PART OF SECONDARY  
 EDUCATION - RADIOISOTOPES?  
 THE SCIENCE TEACHER  
 02 00 64 3  
 \*INSERVICE TEACHER EDUCATION, \*NUCLEAR SCIENCE, \*RADIOISOTOPES, \*SEC-  
 ONDARY SCHOOL SCIENCE, \*TEACHER EDUCATION, BIOLOGY, CHEMISTRY,  
 PHYSICS, NATIONAL SCIENCE FOUNDATION, ATOMIC ENERGY COMMISSION, \*CUR-  
 RICULUM
8. SE 001 433 09 22 67 09 45 20 1 00 000 197  
 CRONEIS, CAREY  
 FUTURE SPECTRUM OF EARTH SCIENCE EDUCATION  
 JOURNAL OF GEOLOGICAL EDUCATION  
 04 00 65 3  
 \*COLLEGE SCIENCE, \*CURRICULUM DEVELOPMENT, \*EARTH SCIENCE, \*EDUCA-  
 TIONAL OBJECTIVES, GEOLOGY, PAPERS, SECONDARY SCHOOL SCIENCE

9. SE 000 493 09 12 67 09 95 20 3 51 000 258  
 EDUCATIONAL POLICIES COMMISSION  
 EDUCATION AND THE SPIRIT OF SCIENCE  
 NATIONAL EDUCATION ASSOCIATION  
 66 27  
 \*EDUCATIONAL OBJECTIVES, \*SCIENCE EDUCATION, \*SOCIOECONOMIC INFLUENCES,  
 NATIONAL EDUCATION ACT, EDUCATIONAL POLICIES COMMISSION
10. SE 001 960 09 05 67 09 94 17 2 22 000 319  
 EISS, ALBERT FRANK  
 A DETERMINATION OF THE RELATIVE IMPORTANCE OF KNOWLEDGE OF SCIENCE  
 TO THE DUTIES OF HOTEL MANAGERS  
 UNIVERSITY MICROFILMS, ANN ARBOR, MICHIGAN  
 54 172  
 \*COLLEGE SCIENCE, \*HOTEL MANAGERS, \*SPECIAL PROGRAMS, BIOCHEMISTRY,  
 PHYSICS, RESEARCH REPORTS, 1954
11. SE 000 122 09 07 67 09 86 20 2 00 000 007  
 FARRE, G. L.  
 ON THE PROBLEM OF SCIENTIFIC DISCOVERY  
 THE SCIENCE TEACHER  
 10 00 66 4  
 \*PROBLEM SOLVING, \*SCIENTIFIC METHOD, \*SCIENTIFIC ENTERPRISE, \*SCIENCE  
 EDUCATION, DISCOVERY, \*OBJECTIVES
12. SE 000 174 07 05 67 09 12 20 1 00 000 001  
 FOWLER, H. SEYMOUR  
 CONSERVATION EDUCATION AND HIGH SCHOOL SCIENCE TEACHING  
 THE AMERICAN BIOLOGY TEACHER  
 09 00 66 2  
 \*CONSERVATION EDUCATION, \*OUTDOOR EDUCATION, SECONDARY SCHOOL  
 SCIENCE, THE PENNSYLVANIA STATE UNIVERSITY, UNIVERSITY PARK, NATIONAL  
 ASSOCIATION OF BIOLOGY TEACHERS, U. S. DEPARTMENT OF HEALTH, EDUCA-  
 TION, AND WELFARE, CONSERVATION FOUNDATION, 1966
13. SE 000 911 08 28 67 09 83 19 2 00 000 006  
 FRASER, THOMAS P.  
 THE IMPACT OF CHANGE ON THE PRIVATE COLLEGE - THE PRIVATE  
 COLLEGE AND NEW PERSPECTIVES IN SCIENCE EDUCATION  
 SCIENCE EDUCATION  
 02 00 65 11  
 \*CURRICULUM, \*COLLEGES, \*EDUCATIONAL OBJECTIVES, PRIVATE COLLEGES,  
 SCIENCE EDUCATION

14. SE 001 961 09 05 67 09 13 17 2 22 000 319  
FRIBOURGH, JAMES HENRY  
RECOMMENDED PRINCIPLES AND GENERALIZATIONS FOR AN INTRODUCTORY  
BIOLOGY COURSE IN THE JUNIOR COLLEGE  
UNIVERSITY MICROFILMS, ANN ARBOR, MICHIGAN  
57 443  
\*BIOLOGY, \*COURSE CONTENT, \*CURRICULUM DEVELOPMENT, \*COLLEGE  
SCIENCE, \*SCIENTIFIC PRINCIPLES, JUNIOR COLLEGE, RESEARCH REPORTS, 1957
15. SE 001 047 08 22 67 09 86 17 2 00 000 006  
GEORGE, KENNETH D.  
A COMPARISON OF THE CRITICAL-THINKING ABILITIES OF SCIENCE AND NON-  
SCIENCE MAJORS  
SCIENCE EDUCATION  
02 00 67 4  
\*COLLEGE SCIENCE, \*CRITICAL THINKING, \*RESEARCH REPORTS, \*SCIENTIFIC  
METHODOLOGY, NATURAL SCIENCES, TEACHER EDUCATION, WATSON-GLASER  
CRITICAL THINKING APPRAISAL, UNIVERSITY OF KANSAS, 1964, 1965
16. SE 000 370 08 25 67 09 91 20 2 00 000 010  
HILL, KATHERINE E.  
SCIENCE FOR CHILDREN--WHY?  
SCIENCE AND CHILDREN  
05 00 66 2  
\*CURRICULUM DEVELOPMENT, \*COURSE CONTENT, \*ELEMENTARY SCHOOL  
SCIENCE, \*EDUCATIONAL OBJECTIVES, CURRICULUM, CONCEPTUAL SCHEMES,  
SCIENCE SKILLS
17. SE 000 372 08 25 67 09 91 30 2 00 000 010  
HINMON, DEAN E.  
PROBLEM SOLVING (PART II)  
SCIENCE AND CHILDREN  
05 00 66 2  
\*COGNITIVE DEVELOPMENT, \*ELEMENTARY SCHOOL SCIENCE, \*PROBLEM  
SOLVING, \*PROBLEM SOLVING ACTIVITIES, SCIENCE SKILLS, SCIENTIFIC METHOD

18. SE 000 399 08 21 67 09 95 20 1 00 000 007  
 KLINE, MORRIS  
 THE LIBERAL EDUCATION VALUES OF SCIENCE  
 THE SCIENCE TEACHER  
 11 00 65 3  
 \*ELEMENTARY SCHOOL SCIENCE, \*GENERAL EDUCATION, \*COLLEGE SCIENCE,  
 \*SCIENTIFIC ATTITUDES, \*SCIENTIFIC LITERACY, \*SECONDARY SCHOOL SCIENCE,  
 \*EDUCATIONAL OBJECTIVES, CURRICULUM, LIBERAL EDUCATION
19. SE 000 848 09 07 67 09 95 17 3 10 000 309  
 KOELSCHE, CHARLES L. AND MORGAN, ASHLEY G.  
 SCIENTIFIC LITERACY IN THE SIXTIES  
 UNIVERSITY OF GEORGIA PRINTING DEPARTMENT, ATHENS  
 09 00 64 38  
 \*LITERACY, \*SCIENTIFIC LITERACY, \*SCIENTIFIC PRINCIPLES, CONCEPT FORMA-  
 TION, GENERAL EDUCATION, READING, PHYSICAL SCIENCE STUDY COMMITTEE,  
 CHEMICAL BOND APPROACH, CHEMICAL EDUCATION MATERIALS STUDY, BIO-  
 LOGICAL SCIENCES CURRICULUM STUDY
20. SE 001 205 07 25 67 09 85 17 2 22 000 319  
 MCCLOSKEY, JAMES  
 THE DEVELOPMENT OF THE ROLE OF SCIENCE IN GENERAL EDUCATION FOR  
 ELEMENTARY AND SECONDARY SCHOOLS  
 UNIVERSITY MICROFILMS, ANN ARBOR, MICHIGAN  
 63 491  
 \*ELEMENTARY SCHOOL SCIENCE, \*GENERAL EDUCATION, \*SCIENCE EDUCATION  
 HISTORY, CURRICULUM DEVELOPMENT, SECONDARY SCHOOL SCIENCE, TEACHING  
 METHODS, RESEARCH REPORTS
21. SE 000 204 07 06 67 09 35 20 1 00 000 009  
 MARANTZ, SAMUEL A.  
 THE STRUCTURE OF PHYSICS - A TEACHING OBJECTIVE  
 THE PHYSICS TEACHER  
 10 00 66 3  
 \*EDUCATIONAL OBJECTIVES, \*SECONDARY SCHOOL SCIENCE, \*TEACHING PRO-  
 CEDURES, PHYSICS

22. SE 001 439 09 22 67 09 43 20 1 00 000 197  
 MERRILL, WILLIAM M.  
 PURPOSES OF UNDERGRADUATE DEGREE PROGRAMS IN GEOLOGY  
 JOURNAL OF GEOLOGICAL EDUCATION  
 06 00 65 2  
 \*COLLEGE SCIENCE, \*EDUCATIONAL OBJECTIVES, \*GEOLOGY, UNDERGRADUATE  
 PROGRAMS, \*UNDERGRADUATE STUDY, CURRICULUM, EARTH SCIENCE, EDUCA-  
 TIONAL PROGRAMS, PAPERS
23. SE 000 190 07 05 67 09 95 20 1 00 000 007  
 AN NSTA STAFF REPORT  
 DON'T DODGE THE DRUG QUESTIONS  
 THE SCIENCE TEACHER  
 11 00 66 4  
 \*BIOLOGY, \*DRUGS, \*SECONDARY SCHOOL SCIENCE, \*TEACHER RESOURCE  
 MATERIALS, \*NATIONAL SCIENCE TEACHERS ASSOCIATION, LSD, FEDERAL FOOD,  
 DRUG, AND COSMETIC ACT, DRUG ABUSE CONTROL AMENDMENTS OF 1965, FED-  
 ERAL DRUG ADMINISTRATION, BUREAU OF NARCOTICS, WORLD HEALTH ORGAN-  
 IZATION, 1964
24. SE 000 790 06 30 67 09 12 20 1 00 000 008  
 NOVAK, JOSEPH  
 WHAT SHOULD WE TEACH IN BIOLOGY?  
 JOURNAL OF RESEARCH IN SCIENCE TEACHING  
 09 00 63 3  
 \*BIOLOGY, \*COGNITIVE LEARNING, \*COURSE CONTENT, \*SECONDARY SCHOOL  
 SCIENCE, CURRICULUM, LEARNING, \*RESEARCH REVIEWS, \*OBJECTIVES
25. SE 001 936 09 12 67 09 12 17 2 22 000 319  
 RABB, DONALD DRUM  
 THE SELECTION OF PRINCIPLES REGARDED BY PERSONS INVOLVED IN TEACHING  
 AND LEARNING AS FUNDAMENTAL FOR TENTH GRADE GENERAL BIOLOGY  
 UNIVERSITY MICROFILMS, ANN ARBOR, MICHIGAN  
 59 142  
 \*BIOLOGY, \*COURSE CONTENT, \*SECONDARY SCHOOL SCIENCE, CURRICULUM,  
 CURRICULUM DEVELOPMENT, GRADE 10, SCIENCE PRINCIPLES, RESEARCH  
 REPORTS, PENNSYLVANIA, 1959, \*OBJECTIVES

26. SE 000 675 06 29 67 09 96 19 1 00 000 004  
 REINER, WILLIAM B.  
 MEETING THE CHALLENGE OF RECENT DEVELOPMENTS IN SCIENCE IN ASSESSING THE OBJECTIVES OF MODERN INSTRUCTION  
 SCHOOL SCIENCE AND MATHEMATICS  
 04 00 66 7  
 \*CURRICULUM DEVELOPMENT, \*EDUCATIONAL OBJECTIVES, \*ELEMENTARY SCHOOL SCIENCE, \*SECONDARY SCHOOL SCIENCE, STUDENT EVALUATION, ELEMENTARY SCHOOL SCIENCE PROJECT, UNIVERSITY OF ILLINOIS ELEMENTARY SCHOOL SCIENCE PROJECT, SCIENCE -A PROCESS APPROACH, AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE, PHYSICAL SCIENCE STUDY COMMITTEE, BIOLOGICAL SCIENCES CURRICULUM STUDY, CHEMICAL BOND APPROACH, CHEMICAL EDUCATION MATERIALS STUDY, EARTH SCIENCE CURRICULUM PROJECT, PRINCETON UNIVERSITY JUNIOR HIGH SCHOOL SCIENCE PROJECT, NATURAL SCIENCES, SCIENCE MANPOWER PROJECT, TEACHERS COLLEGE, COLUMBIA UNIVERSITY
27. SE 000 937 06 30 67 09 92 20 1 00 000 004  
 RENNER, JOHN W.  
 WHY CHANGE SCIENCE TEACHING?  
 SCHOOL SCIENCE AND MATHEMATICS  
 05 00 64 4  
 \*EDUCATIONAL OBJECTIVES, \*SCIENCE INSTRUCTION, \*SECONDARY SCHOOL SCIENCE, BIOLOGY, CURRICULUM, CHEMISTRY, GENERAL SCIENCE, PHYSICS, POSITION PAPERS
28. SE 001 082 08 22 67 09 86 17 1 00 000 008  
 RENNER, JOHN W.  
 SCIENCE, ENGINEERING, AND TECHNOLOGY AS THE JUNIOR HIGH STUDENT UNDERSTANDS THEM  
 JOURNAL OF RESEARCH IN SCIENCE TEACHING  
 03 00 63 3  
 \*OCCUPATIONS, \*OCCUPATIONAL INFORMATION, \*RESEARCH REPORTS, \*SECONDARY SCHOOL SCIENCE, \*SECONDARY SCHOOL STUDENTS, ENGINEERS, GRADE 7, GRADE 8, GRADE 9, SCIENTISTS, TECHNICIANS, FRONTIERS OF SCIENCE OF OKLAHOMA
29. SE 001 106 07 31 67 09 81 20 1 00 000 010  
 RENNER, JOHN W.  
 A CASE OF INQUIRY  
 SCIENCE AND CHILDREN  
 03 00 67 3  
 \*ELEMENTARY SCHOOL SCIENCE, \*EDUCATIONAL OBJECTIVES, \*PAPERS, \*TEACHING METHODS, INQUIRY, INSTRUCTION

30. SE 001 569 09 12 67 09 85 17 3 22 000 319  
 RIGGSBY, ERNEST DUWARD  
 THE SCIENTIFIC METHOD AS PRESENTED IN SCIENCE TEXTBOOKS AND AS  
 DESCRIBED BY EMINENT SCIENTISTS  
 UNIVERSITY MICROFILMS, ANN ARBOR, MICHIGAN  
 64 166  
 \*COLLEGE SCIENCE, \*EDUCATIONAL OBJECTIVES, \*SECONDARY SCHOOL SCIENCE,  
 \*SCIENTIFIC METHODOLOGY, \*SCIENTISTS, SCIENTIFIC ENTERPRISE
31. SE 00 37 07 11 67 09 86 20 1 00 000 008  
 ROY, JAMES T.  
 SCIENCE TEACHING AND THE NATURE OF SCIENCE  
 JOURNAL OF RESEARCH IN SCIENCE TEACHING  
 03 00 65 14  
 \*SCIENCE PHILOSOPHY, \*SCIENTIFIC METHODOLOGY, \*SCIENTIFIC LITERACY,  
 \*EDUCATIONAL OBJECTIVES, SCIENTIFIC TERMINOLOGY
32. SE 001 375 09 22 67 09 45 20 1 00 000 197  
 ROY, CHALMER J.  
 LET'S TEACH GEOLOGY AS THE SCIENCE OF THE EARTH  
 JOURNAL OF GEOLOGICAL EDUCATION  
 04 00 66 2  
 \*EDUCATIONAL OBJECTIVES, \*EARTH SCIENCE, \*GEOLOGY, COLLEGE SCIENCE,  
 CURRICULUM DEVELOPMENT, PAPERS, SECONDARY SCHOOL SCIENCE
33. SE 000 419 09 27 67 09 91 20 2 00 000 007  
 SEARS, PAUL B.  
 RESOURCES ARE FOR USING . . . WISELY  
 THE SCIENCE TEACHER  
 09 00 65 6  
 \*CONSERVATION EDUCATION, \*ELEMENTARY SCHOOL SCIENCE, \*SECONDARY  
 SCHOOL SCIENCE, \*TEACHER RESOURCE MATERIALS, BIOLOGY, NATURAL  
 RESOURCES, SPEECHES, NATIONAL SCIENCE TEACHERS ASSOCIATION
34. SE 000 449 09 13 67 02 86 19 2 00 000 007  
 SHAMOS, MORRIS H.  
 THE ROLE OF MAJOR CONCEPTUAL SCHEMES IN SCIENCE EDUCATION  
 THE SCIENCE TEACHER  
 01 00 66 4  
 \*CURRICULUM DEVELOPMENT, \*GENERAL EDUCATION, \*SCIENCE CONCEPTS,  
 \*SCIENCE EDUCATION, \*SPEECHES, \*SCIENTIFIC LITERACY, CONCEPTUAL  
 SCHEMES, EDUCATIONAL OBJECTIVES, NATIONAL SCIENCE TEACHERS ASSOCIA-  
 TION, MILWAUKEE, WISCONSIN

35. SE 000 358 08 18 67 09 81 20 2 00 000 010  
 SUBARSKY, ZACHARIAH  
 COMMUNICATION - A GOAL OF ELEMENTARY SCIENCE TEACHING  
 SCIENCE AND CHILDREN  
 03 00 66 2  
 \*COMMUNICATION, \*ELEMENTARY SCHOOL SCIENCE, \*OBSERVATION (SCIENTIFIC),  
 \*TEACHING METHODS, \*OBJECTIVES
36. SE 001 100 08 18 67 09 32 20 1 00 000 009  
 THOMPSON, PETER  
 AN ARGUMENT FOR PHYSICS AT THE SECONDARY LEVEL  
 THE PHYSICS TEACHER  
 03 00 67 2  
 \*EDUCATIONAL OBJECTIVES, \*GENERAL EDUCATION, \*PHYSICS, \*SECONDARY  
 SCHOOL SCIENCE
37. SE 000 900 07 11 67 09 32 17 1 00 000 006  
 TROWBRIDGE, LESLIE W.  
 A COMPARISON OF THE OBJECTIVES AND INSTRUCTIONAL MATERIALS IN TWO  
 TYPES OF HIGH SCHOOL PHYSICS COURSES  
 SCIENCE EDUCATION  
 03 00 35 6  
 \*EDUCATIONAL OBJECTIVES, \*EVALUATION, \*PHYSICS, \*SECONDARY SCHOOL  
 SCIENCE, CURRICULUM, PHYSICAL SCIENCE STUDY COMMITTEE, RESEARCH  
 REPORTS, \*INSTRUCTIONAL MATERIALS
38. SE 001 978 09 12 67 09 32 17 2 22 000 319  
 TROWBRIDGE, LESLIE WALTER  
 A COMPARISON OF THE OBJECTIVES OF TRADITIONAL HIGH SCHOOL PHYSICS  
 WITH THE OBJECTIVES OF THE PHYSICAL SCIENCE STUDY COMMITTEE COURSE,  
 AND AN ANALYSIS OF THE INSTRUCTIONAL MATERIALS OF THE PHYSICAL. . . .  
 UNIVERSITY MICROFILMS, ANN ARBOR, MICHIGAN  
 61 273  
 \*EDUCATIONAL OBJECTIVES, \*COURSE CONTENT, \*PHYSICS, \*TEACHING  
 METHODS, CONVENTIONAL INSTRUCTION, INSTRUCTIONAL MATERIALS, RESEARCH  
 REPORTS, SECONDARY SCHOOL SCIENCE, SCIENCE COURSE IMPROVEMENT  
 PROJECT, PHYSICAL SCIENCE STUDY COMMITTEE, 1961



39. SE 000 379 08 21 67 09 12 20 1 00 000 007  
UMBREIT, WAYNE  
SHOULD MICROBIOLOGY RADIOISOTOPES BE A PART OF SECONDARY EDUCATION?  
THE SCIENCE TEACHER

02 00 64 3

\*BIOLOGY, \*COURSE CONTENT, \*MICROBIOLOGY, \*SECONDARY SCHOOL SCIENCE,  
\*TEACHER EDUCATION, NUCLEAR SCIENCE, RADIOISOTOPES, \*OBJECTIVES,  
\*CURRICULUM

# LEARNING THEORIES AND PROCESSES

1. SE 000 639 09 27 67 08 91 20 3 51 000 261  
AAAS COMMISSION ON SCIENCE EDUCATION  
THE PSYCHOLOGICAL BASES OF SCIENCE - A PROCESS APPROACH  
AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE  
65 35  
\*COURSE CONTENT, \*CURRICULUM DEVELOPMENT, \*ELEMENTARY SCHOOL SCIENCE, \*EDUCATIONAL OBJECTIVES, \*SCIENTIFIC METHODOLOGY, EDUCATIONAL PSYCHOLOGY, LEARNING, SECONDARY SCHOOL SCIENCE, TEACHING METHODS, 1963, 1964, 1965, AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE, SCIENCE - A PROCESS APPROACH
  
2. SE 001 455 10 11 67 08 86 20 1 00 000 008  
ANDERSON, O. ROGER  
A REFINED DEFINITION OF STRUCTURE IN TEACHING  
JOURNAL OF RESEARCH IN SCIENCE TEACHING  
66 2  
\*CONCEPT FORMATION, \*LEARNING THEORIES, \*LEARNING, \*STRUCTURE (SUBJECT MATTER), PAPERS
  
3. SE 000 805 07 10 67 08 71 17 1 00 000 008  
ANDERSON, RONALD D.  
CHILDREN'S ABILITY TO FORMULATE MENTAL MODELS TO EXPLAIN NATURAL PHENOMENA  
JOURNAL OF RESEARCH IN SCIENCE TEACHING  
12 00 65 7  
\*CONCEPT FORMATION, \*CONCEPTUAL MODELS, \*ELEMENTARY SCHOOL SCIENCE, \*LEARNING, MENTAL ABILITY, MADISON, WISCONSIN, CALIFORNIA TEST OF MENTAL MATURITY, AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE, RESEARCH REPORTS
  
4. SE 000 398 09 27 67 08 86 19 2 00 000 007  
BRUNER, JEROME S.  
LIBERAL EDUCATION FOR ALL YOUTH  
THE SCIENCE TEACHER  
11 00 65 4  
\*COGNITIVE DEVELOPMENT, \*CURRICULUM DEVELOPMENT, \*LEARNING THEORY, \*SPEECHES, SKILL DEVELOPMENT, NATIONAL EDUCATION ASSOCIATION, NEW YORK CITY, NEW YORK, 1965

5. SE 001 049 08 22 67 08 86 18 2 00 000 006  
 BUELL, ROBERT R.  
 PIAGETIAN THEORY INTO INQUIRY ACTION  
 SCIENCE EDUCATION  
 02 00 67 2  
 \*COGNITIVE LEARNING, \*EDUCATIONAL PSYCHOLOGY, \*ELEMENTARY SCHOOL SCIENCE, \*LEARNING THEORY, \*SECONDARY SCHOOL SCIENCE, RESEARCH REVIEWS, SCIENTIFIC METHODOLOGY, TEACHING METHODS, PIAGET
6. SE 000 046 08 16 67 08 91 17 3 00 000 008  
 BUTTS, DAVID P. AND JONES, HOWARD I.  
 INQUIRY TRAINING AND PROBLEM SOLVING IN ELEMENTARY SCHOOL CHILDREN  
 JOURNAL OF RESEARCH IN SCIENCE TEACHING  
 03 00 66 7  
 \*CONCEPT DEVELOPMENT, \*ELEMENTARY SCHOOL SCIENCE, \*INSTRUCTION, \*PROBLEM SOLVING, \*PHYSICAL SCIENCE, COGNITIVE DEVELOPMENT, INQUIRY SKILLS, SEQUENTIAL TEST OF EDUCATIONAL PROGRESS, NATIONAL ACHIEVEMENT TEST, ELEMENTARY SCIENCE TEST, TAB INVENTORY OF SCIENCE PROCESSES
7. SE 000 064 08 16 67 08 91 18 3 00 000 004  
 CUNNINGHAM, JOHN D.  
 RIGIDITY IN CHILDREN'S PROBLEM SOLVING - SCIS  
 SCHOOL SCIENCE AND MATHEMATICS  
 04 00 66 18  
 \*COGNITIVE DEVELOPMENT, \*ELEMENTARY SCHOOL SCIENCE, \*PROBLEM SOLVING, \*MENTAL RIGIDITY, DIVERGENT THINKING, SCIENCE CURRICULUM IMPROVEMENT STUDY (SCIS), NATIONAL ASSOCIATION FOR RESEARCH IN SCIENCE TEACHING, NATIONAL SCIENCE FOUNDATION, RESEARCH REVIEWS, EINSTELLUNG RIGIDITY
8. SE 000 156 08 16 67 08 91 17 1 00 000 008  
 DENNIS, DAVID M.  
 THE INTRODUCTION OF CONCEPTS IN KINETIC MOLECULAR THEORY TO CHILDREN  
 JOURNAL OF RESEARCH IN SCIENCE TEACHING  
 06 00 66 6  
 \*CONCEPT FORMATION, \*CONCEPT PLACEMENT, \*ELEMENTARY SCHOOL SCIENCE, \*ELEMENTARY SCHOOLS, PHYSICAL SCIENCE, SCIENCE EDUCATION, 1964, 1965, WESTERN NEW MEXICO UNIVERSITY, SILVER CITY, NEW MEXICO, DEPARTMENT OF EDUCATION AND PSYCHOLOGY, PITTMAN'S INITIAL TEACHING ALPHABET, SIXTH STREET SCHOOL, PITTNER-CUNNINGHAM TEST, LORGE-THORNDIKE TEST

9. SE 001 059 07 19 67 08 22 17 1 00 000 006  
 GLASSMAN, SEYMOUR  
 HIGH SCHOOL STUDENTS' IDEAS WITH RESPECT TO CERTAIN CONCEPTS RELATED  
 TO CHEMICAL FORMULAS AND EQUATIONS  
 SCIENCE EDUCATION  
 02 00 67 11  
 \*CHEMISTRY, \*CONCEPT FORMATION, \*SECONDARY SCHOOL SCIENCE, \*SECON-  
 DARY SCHOOL STUDENTS, GENERAL SCIENCE, PHYSIOGRAPHY, RESEARCH  
 REPORTS
10. SE 001 454 10 10 67 08 51 17 1 00 000 008  
 HARRIS, WILLIAM AND LEE, VERLIN  
 MENTAL AGE AND SCIENCE CONCEPTS - A PILOT STUDY  
 JOURNAL OF RESEARCH IN SCIENCE TEACHING  
 66 7  
 \*CONCEPT FORMATION, \*ELEMENTARY SCHOOL SCIENCE, PHYSICAL SCIENCES,  
 \*RESEARCH REPORTS, GRADE 4, GRADE 5, GRADE 6, MENTAL AGE, LEARNING  
 THEORY, BOWLING GREEN, OHIO, CALIFORNIA TEST OF MENTAL MATURITY,  
 1965
11. SE 000 161 07 19 67 08 91 20 1 00 000 010  
 HEFFERNAN, HELEN  
 CONCEPT DEVELOPMENT IN SCIENCE  
 SCIENCE AND CHILDREN  
 09 00 66 4  
 \*CONCEPT FORMATION, \*ELEMENTARY SCHOOL SCIENCE, 1965, 1966, HEAD  
 START PROGRAM, NATIONAL SCIENCE TEACHERS ASSOCIATION, NEW YORK CITY,  
 COUNCIL FOR ELEMENTARY SCIENCE INTERNATIONAL
12. SE 000 466 08 16 67 08 86 20 1 00 000 007  
 IVANY, J. W. GEORGE  
 PSYCHOLOGICAL ASPECTS OF STRUCTURE IN SCIENCE  
 THE SCIENCE TEACHER  
 05 00 66 2  
 \*EDUCATIONAL OBJECTIVES, \*ELEMENTARY SCHOOL SCIENCE, \*LEARNING  
 THEORY, \*SECONDARY SCHOOL SCIENCE, CONCEPT FORMATION, SCIENTIFIC  
 ENTERPRISE, SCIENCE EDUCATION

13. SE 000 147 07 10 67 08 86 20 1 00 000 004  
 JENT, H. CLAY  
 CREATIVE THINKING - SOME BIOLOGICAL UNKNOWNNS AND PROCEDURAL  
 LIKELIHOODS  
 SCHOOL SCIENCE AND MATHEMATICS  
 10 00 66 10  
 \*PROBLEM SOLVING, BIOLOGY, CREATIVE THNIKING, LEARNING THEORY,  
 PSYCHOLOGY, SCIENCE EDUCATION, 1966, CENTRAL MISSOURI STATE COLLEGE,  
 WARRENSBURG
14. SE 001 143 07 31 67 08 12 18 1 00 000 004  
 LISONBEE, LORENZO  
 TEACHING SCIENCE TO THE SLOW LEARNER - THE BSCS POINT OF VIEW  
 SCHOOL SCIENCE AND MATHEMATICS  
 01 00 65 3  
 BIOLOGY, SCIENCE COURSE IMPROVEMENT PROJECT, SECONDARY SCHOOL  
 STUDENTS, SECONDARY SCHOOL SCIENCE, SLOW LEARNERS, BIOLOGICAL  
 SCIENCES CURRICULUM STUDY
15. SE 000 842 08 22 67 08 86 20 2 00 000 008  
 NOVAK, J. D.  
 A MODEL FOR THE INTERPRETATION AND ANALYSIS OF CONCEPT FORMATION  
 JOURNAL OF RESEARCH IN SCIENCE TEACHING  
 03 00 65 12  
 \*CONCEPT FORMATION, \*COGNITIVE DEVELOPMENT, \*INTELLECTUAL DEVELOP-  
 MENT, \*LEARNING THEORY, \*PROBLEM SOLVING, \*SCIENCE EDUCATION, ATTI-  
 TUDES, CREATIVITY
16. SE 000 834 07 11 67 08 81 17 1 00 000 008  
 ROWE, MARY BUDD  
 INFLUENCE OF CONTEXT-LEARNING ON SOLUTION OF TASK-ORIENTED SCIENCE  
 PROBLEMS  
 JOURNAL OF RESEARCH IN SCIENCE TEACHING  
 03 00 65 7  
 \*COGNITIVE LEARNING, \*CONTENT LEARNING, \*ELEMENTARY SCHOOL SCIENCE,  
 \*LEARNING THEORY, CONCEPT FORMATION, GRADE 1

17. SE 001 027 08 28 67 08 82 18 1 00 000 006  
 RUTLEDGE, JAMES A.  
 INQUIRY IN THE HIGH SCHOOL SCIENCE LABORATORY  
 SCIENCE EDUCATION  
 12 00 66 7  
 \*INQUIRY, \*PROBLEM SOLVING, \*SCIENCE ACTIVITIES, PRESERVICE TEACHER  
 EDUCATION, SCIENCE EDUCATION, SPEECHES, AMERICAN ASSOCIATION FOR THE  
 ADVANCEMENT OF SCIENCE
18. SE 001 062 08 15 67 08 51 17 1 00 000 008  
 SCOTT, NORVAL C., JR.  
 THE STRATEGY OF INQUIRY AND STYLES OF CATEGORIZATION  
 JOURNAL OF RESEARCH IN SCIENCE TEACHING  
 09 00 66 6  
 \*COGNITIVE DEVELOPMENT, \*ELEMENTARY SCHOOL SCIENCE, \*INQUIRY,  
 \*PHYSICAL SCIENCES, \*PROBLEM SOLVING, BIOLOGY, ELEMENTARY SCHOOL  
 STUDENTS, GRADE 4, GRADE 5, GRADE 6, INQUIRY SKILLS, TEACHING METHODS,  
 U. S. OFFICE OF EDUCATION, IOWA TEST OF BASIC SKILLS, SCIENCE CONCEPT  
 ACHIEVEMENT TEST,
19. SE 001 980 09 12 67 08 86 17 2 22 000 319  
 SOLOMON, MARVIN DAVID  
 THE PERSONALITY FACTOR OF RIGIDITY AS AN ELEMENT IN THE TEACHING OF  
 THE SCIENTIFIC METHOD  
 UNIVERSITY MICROFILMS, ANN ARBOR, MICHIGAN  
 51 183  
 \*LEARNING, \*MENTAL RIGIDITY, \*PERSONALITY, \*RESEARCH REPORTS,  
 \*SCIENTIFIC METHODOLOGY, COGNITIVE LEARNING, INSTRUCTION,  
 CALIFORNIA ETHNOCENTRIC SCALE, 1951
20. SE 001 448 10 10 67 09 86 20 1 00 000 008  
 ST. JOHN, CLINTON  
 CAN SCIENCE EDUCATION BE SCIENTIFIC? NOTES TOWARD A VIABLE THEORY  
 OF SCIENCE TEACHING  
 JOURNAL OF RESEARCH IN SCIENCE TEACHING  
 12 00 66 4  
 \*EDUCATIONAL OBJECTIVES, \*INSTRUCTIONAL PROCEDURES, \*LEARNING, PAPERS,  
 \*SCIENCE EDUCATION, \*THEORY FORMATION, ASSOCIATION FOR THE EDUCATION  
 OF TEACHERS IN SCIENCE

21. SE 000 780 08 22 67 08 91 20 2 00 000 008  
THIER, HERBERT D. AND OTHERS  
A CONCEPT OF MATTER FOR THE FIRST GRADE  
JOURNAL OF RESEARCH IN SCIENCE TEACHING  
12 00 63 4  
\*CONCEPT FORMATION, \*ELEMENTARY SCHOOL SCIENCE, \*PROBLEM SOLVING,  
\*GRADE 1, \*INTELLECTUAL DEVELOPMENT, SCIENCE COURSE IMPROVEMENT  
PROJECT
22. SE 001 002 08 22 67 08 12 30 1 00 000 001  
WESLEY, FRANK  
DEMONSTRATIONS IN ANIMAL LEARNING  
THE AMERICAN BIOLOGY TEACHER  
04 00 66 3  
\*COLLEGE SCIENCE, \*LABORATORY TECHNIQUES, \*LEARNING, \*PSYCHOLOGY,  
\*SECONDARY SCHOOL SCIENCE, \*ZOOLOGY, ANIMAL NEUROLOGY, ANIMAL  
PHYSIOLOGY, ANIMAL PSYCHOLOGY, BIOLOGY

# RESEARCH METHODOLOGY

1. SE 001 801 08 23 67 14 83 20 2 21 000 251  
COOLEY, WILLIAM  
CHALLENGES TO THE IMPROVEMENT OF SCIENCE EDUCATION RESEARCH  
(PAPER PRESENTED AT NARST MEETING)  
HARVARD UNIVERSITY, CAMBRIDGE, MASSACHUSETTS  
  
02 00 61 10  
\*EDUCATIONAL RESEARCH, \*RESEARCH METHODOLOGY, \*SCIENCE EDUCATION  
RESEARCH, \*SCIENCE RESOURCE CENTERS
  
2. SE 000 778 06 27 67 14 22 20 1 00 000 008  
GALLAGHER, JAMES J.  
COMMENT AND CRITICISM - STANDARDS FOR RESEARCH  
JOURNAL OF RESEARCH IN SCIENCE TEACHING  
  
12 00 63 4  
EDUCATIONAL RESEARCH, RESEARCH METHODOLOGY, SCIENCE EDUCATION,  
PAPERS
  
3. SE 000 770 08 25 67 14 86 20 2 38 000 304  
RAGSDALE, RONALD G.  
RECENT DEVELOPMENTS IN DATA COLLECTION AND ANALYSIS FOR EXPERIMENTS  
UNIVERSITY OF PITTSBURGH, R. AND D. CENTER, PENNSYLVANIA  
  
02 00 66 9  
\*DATA COLLECTION, \*DATA PROCESSING, \*EDUCATIONAL RESEARCH, \*EDUCA-  
TIONAL RESEARCH METHODS, COMPUTERS, PAPERS
  
4. SE 000 838 07 07 67 14 83 20 1 00 000 008  
SCANDURA, JOSEPH M. AND NELSON, JACK L.  
THE EMERGING RESEARCH ROLE OF THE SUBJECT MATTER EDUCATOR  
JOURNAL OF RESEARCH IN SCIENCE TEACHING  
  
03 00 65 3  
\*EDUCATIONAL RESEARCH, \*RESEARCH METHODOLOGY, \*RESEARCHERS, \*SCIENCE  
EDUCATION, COLLEGE SCIENCE TEACHERS, INTERDISCIPLINARY RESEARCH,  
SCIENCE EDUCATORS



5. SE 000 068 09 27 67 14 92 18 3 22 000 330  
 SECONDARY SCHOOL LEVEL COMMITTEE, WAYNE TAYLOR  
 REVIEW OF RESEARCH STUDIES IN SCIENCE EDUCATION 1961-63  
  
 SCIENCE AND MATHEMATICS TEACHING CENTER  
 MICHIGAN STATE UNIVERSITY, EAST LANSING  
 65 50  
 \*BIBLIOGRAPHIES, \*EDUCATIONAL RESEARCH, \*RESEARCH REVIEWS, \*SCIENCE  
 EDUCATION, \*SECONDARY SCHOOL SCIENCE, ATTITUDES, ACADEMIC ACHIEVE-  
 MENT, BIOLOGY, CURRICULUM, CHEMISTRY, EVALUATION, EARTH SCIENCE,  
 EFFECTIVE TEACHING, GENERAL SCIENCE, INSTRUCTION, INSERVICE EDUCATION,  
 INSTRUCTIONAL MATERIALS, LEARNING, PHYSICAL SCIENCES PHYSICS, SCIENCE  
 FACILITIES, TEACHING METHODS, TEACHER EDUCATION, U. S. OFFICE OF  
 EDUCATION, NATIONAL ASSOCIATION FOR RESEARCH IN SCIENCE TEACHING
6. SE 001 052 08 15 67 14 86 40 1 00 000 006  
 SMAWLEY, ROBERT B.  
 SCIENCE AND SERENDIPITY  
  
 SCIENCE EDUCATION  
  
 02 00 67 2  
 \*RESEARCH METHODOLOGY, \*SCIENTIFIC RESEARCH, \*SERENDIPITY, SCIENTIFIC  
 TERMINOLOGY
7. SE 000 865 07 27 67 14 86 20 1 22 000 274  
 SMITH, GARY R.  
 USING PERT TO GUIDE A RESEARCH PROJECT  
  
 WAYNE STATE UNIVERSITY, MICHIGAN  
  
 02 00 67 14  
 \*RESEARCH METHODS, \*RESEARCH PLANNING, \*PAPERS, EDUCATIONAL RESEARCH,  
 RESEARCH TECHNIQUES, U. S. OFFICE OF EDUCATION, PERFORMANCE EVALU-  
 ATION AND REVIEW TECHNIQUES (PERT), NATIONAL ASSOCIATION FOR RESEARCH  
 IN SCIENCE TEACHING
8. SE 000 787 09 12 67 14 86 18 3 00 000 008  
 SMITH, HERBERT A.  
 EDUCATIONAL RESEARCH RELATED TO SCIENCE INSTRUCTION FOR THE ELEMEN-  
 TARY AND JUNIOR HIGH SCHOOL - A REVIEW AND COMMENTARY  
  
 JOURNAL OF RESEARCH IN SCIENCE TEACHING  
  
 09 00 63 27  
 \*CURRICULUM DEVELOPMENT, \*ELEMENTARY SCHOOL SCIENCE, \*SCIENCE  
 EDUCATION, \*SECONDARY SCHOOL SCIENCE, BIBLIOGRAPHIES, COURSE CONTENT,  
 EDUCATIONAL OBJECTIVES, INSTRUCTION, RESEARCH METHODOLOGY, STUDENT  
 EVALUATION, TEACHING METHODS, TEACHER EDUCATION, AMERICAN ASSOCIA-  
 TION FOR THE ADVANCEMENT OF SCIENCE, COMMISSION ON SCIENCE EDUCATION

9. SE 001 046 08 28 67 14 22 40 2 00 000 006  
 URICHECK, MICHAEL J.  
 RESEARCH PROPOSAL - AN ATTEMPT TO EVALUATE THE SUCCESS OF  
 THE CBA AND CHEMS CHEMISTRY COURSES  
 SCIENCE EDUCATION  
 02 00 67 4  
 \*CHEMISTRY, \*SCIENCE COURSE IMPROVEMENT PROJECT, \*RESEARCH METHOD-  
 OLOGY, \*ACADEMIC ACHIEVEMENT, \*SECONDARY SCHOOL SCIENCE, COURSE  
 EVALUATION, COLLEGE SCIENCE, CREATIVITY, EVALUATION PROCEDURES,  
 CHEMICAL BOND APPROACH, CHEMICAL EDUCATION MATERIALS STUDY
10. SE 000 766 09 07 67 14 86 20 2 00 000 127  
 WATSON, FLETCHER G.  
 TOWARD EFFECTIVE RESEARCH IN SCIENCE EDUCATION  
 THEORY INTO PRACTICE (TIP)  
 12 00 62 7  
 \*EDUCATIONAL RESEARCH, \*RESEARCH DISSEMINATION, \*RESEARCH METHOD-  
 OLOGY, \*SCIENCE EDUCATION
11. SE 000 776 09 12 67 14 86 20 2 00 000 008  
 WINTER, STEPHEN S.  
 COMMENT AND CRITICISM - SCIENCE EDUCATION A SCHOLARLY DISCIPLINE?  
 JOURNAL OF RESEARCH IN SCIENCE TEACHING  
 12 00 63 2  
 \*EDUCATIONAL RESEARCH, \*SCIENCE EDUCATION, ADMINISTRATION, SCIENCE  
 EDUCATION CENTERS