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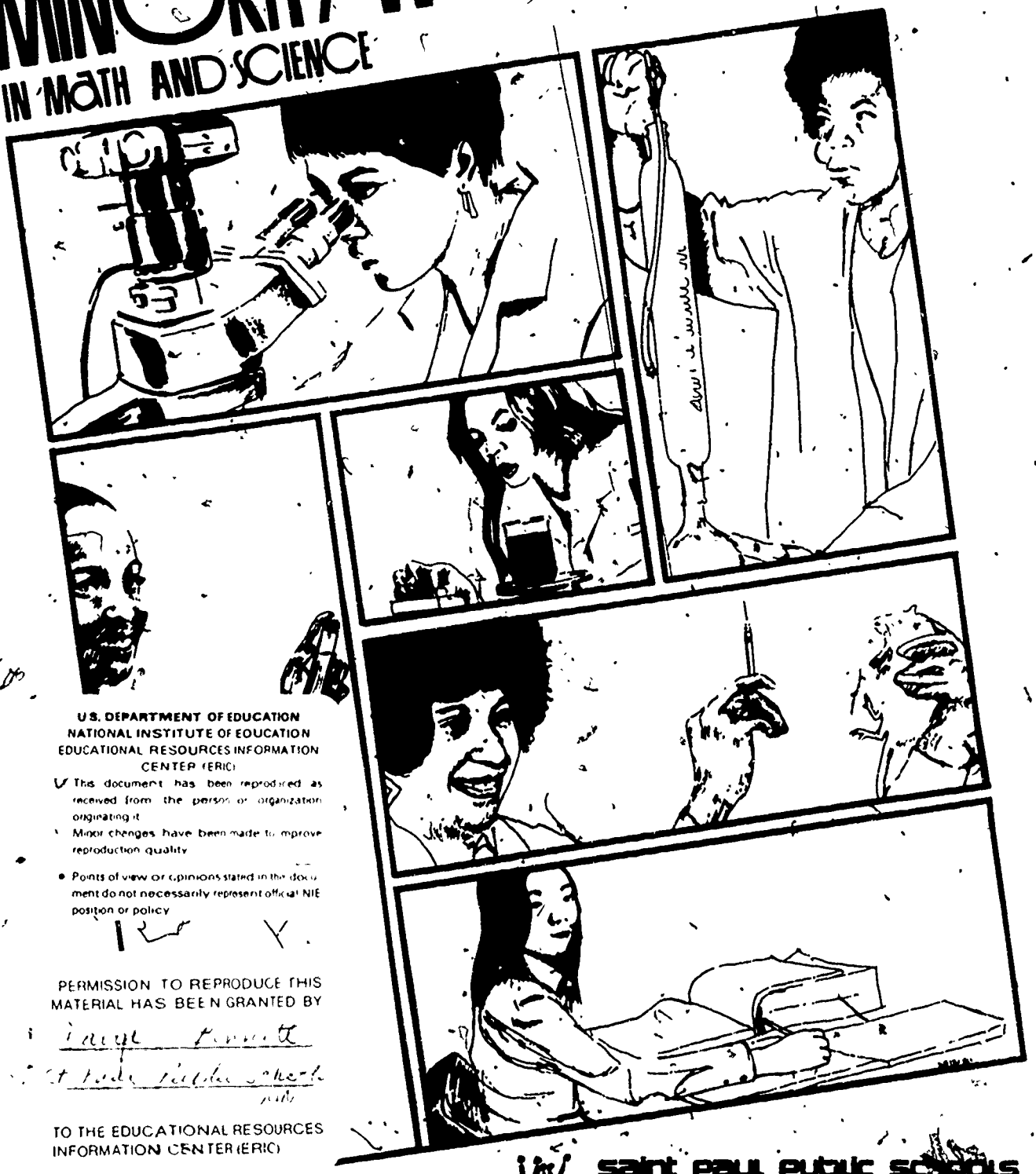
ABSTRACT

This teacher's guide contains lessons and activities that serve as examples of ways to utilize the student booklet, Minority Women in Math and Science, in a variety of subject areas. The minority groups dealt with are American Indians, Asian Americans, Blacks, and Hispanics. The guide consists of eight lesson plans structured in a conceptual format. Information as to the subject area, grade level, and name of teacher who developed it are given. Each lesson plan has an organizational theme given under the heading "Key Concepts" (stereotyping, discrimination, careers) which should facilitate the incorporation of these lessons into ongoing curricula. One or more "generalizations" for each lesson provides teachers with a statement or statements of content emphasis. Specific behavioral objectives are followed by a section on teaching procedures and activities designed to help achieve those objectives; this section provides activities, discussion questions, worksheets, and ideas for use in presenting the main ideas of the lesson. To evaluate the effectiveness of the lessons, specific wrap-up activities are provided in an evaluative procedure section. A listing of books, articles, and other materials needed for each lesson follows each lesson plan. A bibliography lists resources for students and for teachers, a movie for classroom use, and relevant professional associations. (CG)

Teacher's Guide For MINORITY WOMEN IN MATH AND SCIENCE



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DEVELOPING MULTI-MEDIA CURRICULUM AIDS FOR TEACHING ABOUT MINORITY WOMEN

Teacher's Guide for Minority Women in Math and Science

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September 1982

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Marge Adkisson - librarian, St. Paul Public Libraries, St. Paul, Minnesota;
Belen Andrada - high school counselor, Minnetonka Public Schools, Minnetonka, Minnesota;
Nerline Faber - elementary teacher, Kilgore Public Schools, Kilgore, Texas;
W.J. Musa Foster - Black student advocate, Robbinsdale Schools, Robbinsdale, Minnesota;
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Frank McCray - human relations consultant, Roseville Area Schools, Roseville, Minnesota;
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Sandra Rubenstein - secondary teacher, St. Paul Public Schools, St. Paul, Minnesota;
Dr. Jeanne Sanchez - medical doctor, Augusta, Maine and Santa Fe, New Mexico;
Dr. Christine T. Wilson - business manager and educational consultant, Michigan Bell, Lansing, Michigan;
Laura Waterman Wittstock - president, MIGIZI Communications, Inc., Minneapolis, Minnesota;
Florence M. Yoshiwara - general manager, Japanese American Curriculum Project, and instructor in Ethnic Studies, College of San Mateo, San Mateo, California.

We would like to express our appreciation to all those individuals who contributed to the development of the booklet. Anita Faber Spencer, former K-12 Curriculum Specialist on Minority Women with this project, developed the field-test version. Advisory committee member, Yolanda Scott George, and many of the minority women featured in the booklet assisted us in locating women in math and science careers. Photographs were provided by the featured women. Seitu Jones designed the art work that is on the covers.

The project staff would like to thank all the teachers of Duluth, Roseville, and St. Paul Public Schools who participated in the in-service workshops and developed lesson plans for using Minority Women in Math and Science in their classroom curricula. A special thanks to the following teachers whose lessons appear in the guide:

Joyce Brown, St. Paul Public Schools
Marlys Henke, St. Paul Public Schools
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Mary Louise Wicklund, Duluth Public Schools

Finally, we would like to acknowledge the strong and continuous support that we have received from our families and friends during the two years we were involved in this project.

INTRODUCTION

"Developing Multi-Media Curriculum Aids for Teaching About Minority Women" was a two-year project (1979-81) funded by the Women's Educational Equity Act Program, U.S. Department of Education. It was based on the needs for students to understand the status, needs, and contributions of American women of color, i.e., American Indian, Asian American, Black, and Hispanic, and for teachers to have materials and assistance in teaching relevant aspects of history, culture, and contributions of these women in their classrooms. The purpose of the project was to develop multi-media curriculum aids for teaching about the four groups of minority women in a variety of subject areas in elementary and secondary curriculum systems.

The work and commitment of many people is represented in this project. Although housed within the St. Paul Public Schools, educators from suburban and urban school districts throughout the state were involved in the field testing of the multi-media curriculum aids. Through their efforts, a variety of materials were developed for use in elementary and secondary classrooms. These materials include four elementary kits, one on each group of minority women, a secondary booklet on minority women in math and science, secondary poster sets on young minority females and their role models, one filmstrip on a minority woman, and an in-service training manual for preparing teachers to use the multi-media curriculum aids.

This kit contains five copies of the student booklet, Minority Women in Math and Science and a teacher's guide. The booklets can be used in the classroom in a variety of ways -- as basic, supplemental, or enrichment materials. They can also be used in conjunction with the poster kits on minority women developed by this project.

Minority Women in Math and Science provides students with information about minority females who have careers in math and science. These role models can be an encouragement in regard to students' career aspirations and goals. In addition, a glossary of terms, an article on barriers which have confronted minority women seeking science and math careers, employment charts, and a listing of high school math and science courses needed for selected occupations are included.

The guide contains lessons and activities developed by secondary teachers during in-service workshops. The lessons are intended to serve as a guide to educators; they are examples of ways to utilize Minority Women in Math and Science in different subject areas. Also included is a bibliography of resources for use with this kit.

Curriculum Format

Each lesson plan is structured in a conceptual format. Information as to subject area, grade level, and the name of the teacher who developed it are designated at the top. Major ideas and organizational themes are provided under the "Key Concept" heading. Key concepts should facilitate the incorporation of the lessons into on-going curricula.

The generalization for each lesson provides teachers with a statement of the content emphasis. Specific behavioral objectives are followed by activities designed to help achieve them.

The section on teaching procedures and activities provides activities, discussion questions, worksheets, and ideas used to present the main ideas of the lessons. To evaluate the effectiveness of these activities, specific wrap-up activities (or post tests) are provided in the evaluation procedure section.

A listing of books, articles, and other materials needed for each lesson is found in the section, "Resources and Materials." These listings provide a minimum list, and users may want to include further resources and materials.

A Note to Users

Each lesson was field tested by its developer. For those individuals who decide to use the lessons as written, the following steps are recommended:

1. The user should become knowledgeable about minority women and the curriculum format used in developing the lesson plans. Ideally, users should have completed in-service training as delineated in the teacher training manual.

2. The lesson should be thoroughly read. Space has been provided in the left margin for notes and/or comments to be written down.

3. Enough lead time should be allowed for becoming acquainted with materials and resources as well as for ordering them.

4. Enough time should be allowed for adequately teaching the lesson plan. During the field testing, developers sometimes found that they underestimated the amount of time that it took to implement their lessons. Lessons were revised after field testing to accommodate their concerns. Some lessons were streamlined; others were revised to include teaching procedures and strategies which provide for easier implementation.

Women have traditionally relinquished their desires to pursue the careers which can be found in math and science areas because these have been traditionally dominated by white males. It is, indeed, important to realize anyone interested in pursuing careers in math and science will have to pay a price in order to enter these areas. However, a person pursuing any career has to pay a price in order to do a good job, and that may mean some extra work. It may also mean combatting some negative attitudes. Math and science careers have some of the same obstacles as other careers. However, because of discrimination caused by sexism and racism (often referred to as the double bind), minority females represent a small part of the total in math and science fields.

The substantial underrepresentation of females, and especially minority females, in the areas of math and science is due in large part to the fear of the unknown. Many times, students have been conditioned to believe literature and language areas are "female" subjects and math and science are only for the males. This conditioning is partly due to stereotypes which suggest math and science careers are too difficult for females to pursue,

especially minority females. Consequently, minority females are substantially underrepresented in science, engineering, and math in proportion to their representation in the general population. It is important that minority females are given opportunities to be treated on an equal basis to that of their male counterparts and given equal positions and responsibilities.

NAME: Project Staff

SUBJECT: Math and Science/Social Studies GRADE LEVEL: 7 - 12

Title of Lesson: Minority Women in Math and Science

Group(s): American Indian, Asian American, Black, and Hispanic

Key Concept(s): Stereotyping and Discrimination

Generalization(s): Race and sex biases have often prevented minority females from pursuing careers in the areas of math and science. However, today, in spite of discrimination, minority women are employed in various math and science careers.

Behavioral Objective(s): Each student will be able to:

1. describe how race and sex biases affect minority females in math and science careers; and

2. identify one minority woman in math and science from each minority group as described in this lesson.

Teaching Procedures and Activities:

1. Teacher will review the terms, "stereotype" and "discrimination," with students.

   Stereotype: A set image or conception held by, or applied to, members of a certain group.

   Discrimination: To make a distinction as in favor of, or against, a person or a group of persons on the basis of race and/or sex rather than on individual merit.

2. Teacher will assign reading selection, "Barriers," from Minority Women in Math and Science. After reading it, the teacher will discuss how race and sex biases affect minority females who pursue careers in science and math.

   Key discussion questions:

   - What are some misconceptions minority females may have about math and science courses? (One cannot be an average

student to be in math and science, one is isolated from society and leads an abnormal life; math and science courses are more difficult than the other courses.)

- What are some examples of race, sex, and class barriers which make it difficult for minority women to pursue careers in math and science? (See article for ideas, answers will vary.)

3. Teacher will assign readings on women in Minority Women in Math and Science. Students will write a one-page paper on one woman from each group. They will research the career area she is pursuing and include this information in the paper.

4. Each student will orally present her/his paper to the class. She/he should also provide an example of the type of work the woman is in by using some of the teacher's suggested activities:

   a. design a poster;

   b. provide an activity for the class to participate in;

   c. contact a minority woman to come into the classroom as a guest speaker; or

   d. if possible, interview a professional minority woman.

5. Teacher will pass out Worksheet #1 for students. Students will complete it.

Evaluation Procedure(s): Each student will describe in an essay how race and sex biases affect minority females in math and science careers and identify at least one woman in math and science from each minority group.

Resources and Materials: Minority Women in Math and Science. Women's Educational Equity Act Program, U.S. Department of Education, Developing Multi-Media Curriculum Aids for Teaching About Minority Women, 1981.

Worksheet #1.

WORKSHEET #1

Minority Women in Math and Science

A. Match the names of the minority women in the first column with their careers in the second column by writing the letter of your choice on the line.

_____	Ms. Judith Forbes-Resha	A. General surgeon
_____	Dr. Deagelia M. Pena	B. Associate director
_____	Ms. Jeanette Brown	C. Research chemist
_____	Dr. Sylvia M. Ramos-Burch	D. Consultant-mammalian biology
_____	Dr. F. Agnes Stroud-Schmink	E. Engineer

B. Write "true" or "false" on the line provided.

1. _____ American Indian women are never discriminated against.
2. _____ Minority women have never been discriminated against by their high school counselors.
3. _____ A late beginning in school will not impede one's progress.
4. _____ Minority females are discriminated against in a white-male society.
5. _____ Girls do not have to be geniuses; they can be average to be in math and science.

C. Complete the following statements:

1. Ms. Georgia P. Dailey Pedro is a district sanitarian at the _____ _____.
2. Ms. Mamie Wong Moy works as an _____.
3. Ms. Valerie L. Thomas is working as a data analyst for _____ _____.
4. Dr. Trevino was honored with a request from the _____ _____.

WORKSHEET #1 -- ANSWERS

Minority Women in Math and Science

A. E
B
C
A
D

B. 1. False
2. False
3. False
4. True
5. True

C. 1. U.S. Public Health Service
2. Associate Professor of Chemistry
3. NASA/GSFC
4. White House

NAME: Mary Louise Wicklund, Duluth Public Schools

SUBJECT: English GRADE LEVEL: 7

Title of Lesson: Careers

Group(s): Asian American

Key Concept(s): Discrimination

Generalization(s): Because of race and sex bias, Asian American women have not been encouraged to pursue careers as scientists and engineers.

Behavioral Objective(s): Each student will be able to identify three fields in which Asian American women are outnumbered ten to one, white male to Asian American female and white female to Asian American female.

Teaching Procedures and Activities:

1. Students will be divided into five groups and given copies of Appendix A, Table B-8 found in the book, Minority Women in Math and Science.

2. Each group is to decide which fields have Asian American women outnumbered ten to one, white male to Asian American female and white female to Asian American female.

3. One member from each group will report back to the entire class. A class chart should be kept where the fields are listed/tallied as each group gives its report.

Note: This lesson may be done with Black women.

Evaluation Procedure(s): Each student will list three fields in which Asian American women are outnumbered ten to one, white male to Asian American female and white female to Asian American female.

Resources and Materials: Minority Women in Math and Science. Women's Educational Equity Act Program, U.S. Department of Education, Developing Multi-Media Curriculum Aids for Teaching About Minority Women, 1981.

Chart paper, marker.

NAME: Project Staff

SUBJECT: Science/Career Study GRADE LEVEL: 7 - 9

Title of Lesson: Minority Women in Medicine

Group(s): American Indian, Asian American, Black, and Hispanic

Key Concept(s): Discrimination

Generalization(s): Women often have a difficult time being accepted in the field of medicine. This poses a double bind for minority women who are often discouraged on the basis of race and sex.

Behavioral Objective(s): Each student will be able to name four minority women in the field of medicine and discuss how the double bind affects them.

Teaching Procedures and Activities:

1. Teacher will ask the students what they believe are the requirements for being a doctor. List on the board.

2. Students will be given an assignment to find out the general requirements for becoming a doctor.

3. Students will share findings, and teacher will list them on the board. Teacher will ask questions that encourage students to think how any requirement mentioned would be harder for a woman than a man. Keep a record of the comments.

4. Next, the teacher will pass out copies of Minority Women in Math and Science. Allow time for reading of biographies and then turn to the section, "Barriers," in the book.

5. Students will read and discuss the comments of the women in the book and then refer back to the written comments developed in activity #3.

   Key discussion questions:

   - What does double bind mean? (The situation of minority women where they are discriminated against on the basis of both sex and race.)

- What kinds of barriers were encountered by minority women seeking science and math careers? (Answers will vary.)

- How do these barriers compare to what was listed earlier by the class? (See comments recorded earlier in activity #3.)

6. If possible, invite a minority woman working in the field of medicine to talk to the class or have students write a letter to a woman of color who is now working in the field of medicine.

Supplementary activity:

Display and discuss the posters on minority women in medical careers from the various poster kits developed by this project.

Evaluation Procedure(s): Each student will name four minority women in the field of medicine and discuss how the double bind affects them.

Resources and Materials:

American Indian Women Poster Kit. Women's Educational Equity Act Program, U.S. Department of Education, Developing Multi-Media Curriculum Aids for Teaching About Minority Women, 1981.

Asian American Women Poster Kit. Women's Educational Equity Act Program, U.S. Department of Education, Developing Multi-Media Curriculum Aids for Teaching About Minority Women, 1981.

Black Women Poster Kit. Women's Educational Equity Act Program, U.S. Department of Education, Developing Multi-Media Curriculum Aids for Teaching About Minority Women, 1981.

Hispanic Women Poster Kit. Women's Educational Equity Act Program, U.S. Department of Education, Developing Multi-Media Curriculum Aids for Teaching About Minority Women, 1981.

Minority Women in Math and Science. Women's Educational Equity Act Program, U.S. Department of Education, Developing Multi-Media Curriculum Aids for Teaching About Minority Women, 1981.

NAME: Mary A. Place, Rochester Public Schools

SUBJECT: English GRADE LEVEL: 10 - 12

Title of Lesson: Stereotypes of Minority Women

Group(s): American Indian, Asian American, Black, and Hispanic

Key Concept(s): Stereotypes

Generalization(s): Stereotypes are unfair because they categorize groups of people. Minority women are often stereotyped.

Behavioral Objective(s): Each student will be able to write a 100-150 word essay identifying the stereotypes of various groups of minority women and how they are affected by them.

Teaching Procedures and Activities:

1. Teacher will ask students to review the definition of "stereotype."

   Stereotype: A set image or conception held by, or applied to, members of a certain group.

2. Teacher will list the four groups of minority women on the board and will ask students to give stereotypes for each group. (The teacher should record the stereotypes on the board.)

3. Teacher will tell the students that discussion of the list of stereotypes will take place later.

4. Teacher will pass out copies of Minority Women in Math and Science for independent reading. The teacher will advise the students to pay special attention to the section, "Barriers," while reading.

5. After independent reading, the teacher will return to the list of students' stereotypes.

   Key discussion questions:

   - Can anyone give an example that will dispel a stereotype listed on this chart? (Teacher will check off each dispelled stereotype.)

- After reading "Barriers," how did you feel about the unfairness of stereotyping?
- How did stereotyping affect the minority women? Did it make them quit or more determined to succeed?
- Do you think that all minority women are affected the same way? (No; some give up.)
- Have you ever been in a situation where you have been stereotyped? (Young person applying for job, long hair, loud music, etc.)

Evaluation Procedure(s): Each student will write a 100-150 word essay identifying the stereotypes for the various groups of minority women and how they are affected by them. (The "Women in Focus Worksheet" can be used for this activity.)

Resources and Materials: Minority Women in Math and Science. Women's Educational Equity Act Program, U.S. Department of Education, Developing Multi-Media Curriculum Aids for Teaching About Minority Women, 1981.

"Women in Focus Worksheet."

NAME: _____ DATE: _____

WOMEN IN FOCUS WORKSHEET

Minority Women - Essay on Stereotypes

Write a 100-150 word essay discussing the following:

a. existing stereotypes for each group of minority women;

b. unfairness and effect of these stereotypes;

c. what can be done about stereotypes.

Remember paragraph organization, topic sentence, grammar usage, general general expression, and mechanics (spelling and punctuation), etc.

NAME: Marlys Henke, St. Paul Public Schools

SUBJECT: Geometry GRADE LEVEL: 11

Title of Lesson: Minority Women in Math and Science Careers

Group(s): Black

Key Concept(s): Discrimination

Generalization(s): Black women are underrepresented in math and science careers.

Behavioral Objective(s): Each student will be able to describe how Black women are underrepresented in math and science careers.

Teaching Procedures and Activities:

1. The following terms will be discussed:

   a. stereotype: a set image or conception held by, or applied to, members of a certain group.

   b. discrimination: to make a distinction as in favor of, or against, a person or persons on the basis of race and/or sex rather than on individual merit.

   c. sexism: discriminatory treatment due to one's sex.

   d. racism: discriminatory treatment due to one's race.

   e. double bind: situation of minority women in the United States where they are discriminated against on the basis of both sex and race.

2. Teacher will duplicate and pass out Appendix B of Minority Women in Math and Science.

3. The following aspects should be discussed:

   a. Differences in numbers of majority vs. Black persons employed.

   b. Differences in numbers of men vs. women (both white and Black) employed.

   c. Reasons for the discrepancies. (Teacher may want to assign the section on "Barriers" prior to this discussion.)

4. Each student will construct a graph illustrating the underrepresentation of Black women in five different occupations listed on the chart in Appendix B. Percentages for groups should be calculated and a circle, square, rectangle, or some other figure used as a base for each occupation.

Supplementary activity:

Note: Minority women are truly discriminated against; the large differences in the figures in Appendix B are not due to just the fact that there are fewer minority women than white men.

Have students look up a current census and compare the percent of minority women in the general population to the percent employed in math and science careers.

Evaluation Procedure(s): Each student will write an essay describing how Black women are underrepresented in science and math careers. She/he will illustrate the essay with a graph depicting underrepresentation in at least two occupations.

Resources and Materials: Minority Women in Math and Science. Women's Educational Equity Act Program, U.S. Department of Education, Developing Multi-Media Curriculum Aids for Teaching About Minority Women, 1981.

Paper, pencils.

NAME: Marlys Henke, St. Paul Public Schools

SUBJECT: Geometry GRADE LEVEL: 11

Title of Lesson: Careers and Math Skills

Group(s): American Indian, Asian American, Black, and Hispanic

Key Concept(s): Careers

Generalization(s): Many professions require math skills.

Behavioral Objective(s): Each student will be able to list ten occupations and a specific math skill needed for each one.

Teaching Procedures and Activities:

Note: This lesson can be integrated into a unit on math careers.

1. Teacher will duplicate and pass out worksheet on careers.
2. Students will read Minority Women in Math and Science and complete the worksheet.
3. Teacher will discuss worksheet results with students. A master chart on the board may be used during the discussion.

   Key discussion questions:

   - Which occupations require math skills? Why?
   - Which math skills seemed to be most in demand?
   - Have you thought about any of these occupations for yourself?
   - What is the importance of completing math courses in high school?

4. Teacher may want to refer to Appendix B in Minority Women in Math and Science for concluding remarks on math courses required for professions.

Evaluation Procedure(s): Each student will list ten occupations. For each occupation, a specific math skill will be listed.

Resources and Materials:

Minority Women in Math and Science. Women's Educational Equity Act Program, U.S. Department of Education, Developing Multi-Media Curriculum Aids for Teaching About Minority Women, 1981.

Consumer and Career Mathematics. Glenview: Scott Foresman and Co., 1978.

Mathematics in Life. Glenview: Scott Foresman and Co., 1977.

"Worksheet on Careers and Mathematics Skills."

WORKSHEET ON CAREERS AND MATH SKILLS

Read through Minority Women in Math and Science. List the careers requiring math skills and a specific math skill needed for each one. An example is done for you.

Career	Specific Math Skill Needed
Geologist	Graph making and interpreting

NAME: Joyce Brown, St. Paul Public Schools

SUBJECT: Home Economics GRADE LEVEL: 12

Title of Lesson: Minority Women in Science and Medicine

Group(s): American Indian, Asian American, Black, and Hispanic

Key Concept(s): Careers

Generalization(s): Minority women are in a variety of science and medical careers.

Behavioral Objective(s): Each student will be able to write a two-page essay on three minority women in three different careers in science or medicine.

Teaching Procedures and Activities:

1. Teacher will divide students into groups and assign readings from Minority Women in Math and Science on minority women in different science and medical careers.

2. Each group will research additional women of color in medical and science professions, indicating where they work, job responsibilities, and family life.

3. Each group will report to the class its findings.

Key discussion questions:

- How many more women were you able to find?
- How many more career areas did you find?
- Did anyone become interested in a science or medical career? Which one?
- Why couldn't you find more women of color?

Supplementary activity:

Arrange for minority women who are employed in science and medical careers to come to the class to speak on their experiences.

Evaluation Procedure(s): Each student will write a two-page essay on three minority women in science or medical careers.

Resources and Materials:

Minority Women in Math and Science. Women's Educational Equity Act Program, U.S. Department of Education, Developing Multi-Media Curriculum Aids for Teaching About Minority Women, 1981.

Additional resources:

American College Testing Program. Women in Science and Technology: Careers for Today and Tomorrow. Iowa City: American College Testing Program, 1976.

Center for Research on Women. Women in the Sciences and Engineering. Palo Alto: Stanford University, 1978.

Malcolm, Shirley Mahaley, Paula Quick Hall, and Janet Welsh Brown. The Double Bind: The Price of Being a Minority Woman in Science. Washington, D.C.: American Association for the Advancement of Science, 1975.

Menard, Sharon L. How High the Sky? How Far the Moon? Newton: Education Development Center, 1979.

Noble, Iris. Contemporary Women Scientists of America. New York: Julian Messner, 1979.

Audio-visual:

Abramowitsch, Peter and Lenore Blum. Sandra, Zella, Dee and Claire: Four Women in Science. Newton: Education Development Center, 1978. (16mm color film or videotape.)

NAME: Project Staff

SUBJECT: Math and Science/Social Studies GRADE LEVEL: 7 - 12

Title of Lesson: Barriers

Group(s): American Indian, Asian American, Black, and Hispanic

Key Concept(s): Discrimination

Generalization(s): Minority women have often been discriminated against in math and science careers. Many times, discrimination has occurred in these areas because of racist and sexist attitudes about minority women.

Behavioral Objective(s): Each student will be able to describe three barriers which minority women have been confronted with in their math and science careers.

Teaching Procedures and Activities:

1. Teacher should assign students to small groups. Each group should be assigned an incident taken from the barriers section in Minority Women in Math and Science. Students should be given directions to develop a written role-playing script which demonstrates the overt and covert racism and sexism minority women in science and math have been confronted with in their careers. The script should be written with each member in the group actively taking part in the role-play situation. Each role play should include:

   a. the incident;

   b. how to cope with the incident; and

   c. how to resolve the incident (choose a method whether it be overt, covert, body language, or openly spoken).

2. Teacher should pass out the checklist and have each student evaluate each role-playing situation.

3. Teacher should elicit discussion from the students about some of the barriers in school activities they have found in comparison to those which minority women had to confront.

Evaluation Procedure(s): Each student will describe three barriers which minority women have been confronted with in the areas of math and science.

Resources and Materials: Minority Women in Math and Science. Women's Educational Equity Act Program, U.S. Department of Education, Developing Multi-Media Curriculum Aids for Teaching About Minority Women, 1981.

Worksheet #1 - Checklist.

WORKSHEET #1 - CHECKLIST

1. Was the barrier clearly expressed in the beginning?_____

_____

2. Was the role-play activity actually centered around the problem?

_____

3. Was the obstacle racist? Answer yes or no. Explain the reason for your answer._____

_____

4. Was the obstacle sexist? Answer yes or no. Explain the reason for your answer._____

_____

5. Was the obstacle both racist and sexist? Answer yes or no._____

_____

6. How did the victim(s) cope with the person(s) projecting the racist/sexist attitude?_____

_____

7. How did the group resolve the situation?_____

_____

8. Was the incident resolved in a way that the minority woman felt as comfortable as everyone else involved?_____

_____

9. If you were a minority woman in this particular situation, how would you react to it?_____

_____

10. Do you feel this group developed a well-planned role play?

Yes_____ No_____

Other comment(s):_____

_____

_____

BIBLIOGRAPHY

I. Resources for Students

American College Testing Program. Women in Science and Technology: Careers for Today and Tomorrow. Iowa City: American College Testing Program, 1976.

This booklet includes information about and pictures of women in scientific and technical careers. A list of resources for further information is also included.

Bowman, Kathy. New Women in Medicine. Mankato: Creative Educational Society, Inc., 1976.

This book contains seven short biographies of women who are employed in medicine. Anna Ellington, a Black doctor, is one of the featured women.

Center for Research on Women. Women in the Sciences and Engineering. Palo Alto: Stanford University, 1978.

This booklet contains information about women working in science and engineering around Stanford University. There is also information about course requirements for science and engineer degrees.

Menard, Sharon L. How High the Sky? How Far the Moon? Newton: Education Development Center, 1979.

This K-12 curriculum resource provides activities designed to expand students' interest in scientific and technical careers. Seven women in science are highlighted and have taped interviews.

Noble, Iris. Contemporary Women Scientists of America. New York: Julian Messner, 1979.

This book contains biographies of nine female scientists including Chien Shiung Wu, a nuclear physicist.

Perl, Teri. Math Equals - Biographies of Women Mathematicians + Related Activities. Reading: Addison-Wesley, 1978.

This book includes an account of the lives and work of nine women mathematicians with mathematics activities which relate to the work of each.

II. Resources for Teachers

Malcolm, Shirley, et. al. The Double Bind: The Price of Being a Minority Woman in Science. Washington, D.C.: American Association for the Advancement of Science, 1975.

This is a report from the A.A.A.S. Conference of thirty minority women scientists in which Black, Puerto Rican, Mexican

American, and Indian women participated. The conference was designed to explore how and why these women had "made it." Among the topics covered were: pre-college experience of family and other social influences such as schools and the mass media, college and professional education, and career and professional experience. The report identifies several commonalities in the experiences of this group of women. It also lists recommendations proposed by conference members to facilitate participation by minority women in science and engineering and some selected resources on minorities and women in science.

Smith, Walter S. and Kala M. Stroup. Science Career Exploration for Women. Washington, D.C.: National Science Teachers Association, 1978.

This booklet contains activities designed to help young women explore science-related professional careers.

Women's Educational Equity Communications Network. Women and Mathematics, An Information Packet. San Francisco: Far West Laboratory, n.d.

This information packet contains articles as well as listings of resources and programs. Available from Women's Educational Equity Act Program, Washington, D.C.

Women's Educational Equity Communications Network. Women and Science, An Information Packet. San Francisco: Far West Laboratory, n.d.

This information packet contains articles as well as listings of resources and programs. Available from Women's Educational Equity Act Program, Washington, D.C.

III. Audio-visual

Abramowitsch, Peter and Lenore Blum. Sandra, Zella, Dee and Claire: Four Women in Science. Newton: Education Development Center, 1978.

This 16mm color film explores the work and lives of an astronomer, a mechanical engineer, a veterinarian, and a laser physicist. It is also available as a videotape. (For grades 7-12.)

IV. Professional Associations

The following is a list of professional associations which can be contacted for reports and information on the status of minority women in different scientific and technical careers.

American Anthropological Association
1703 New Hampshire Avenue, NW
Washington, D.C. 20009

American Institute of Architects
1735 New York Avenue, NW
Washington, D.C. 20006

American Astronomical Society
211 FitzRandolph Road
Princeton, New Jersey 08540

American Chemical Society
1155 16th Street, NW
Washington, D.C. 20036

American Economic Association
1313 21st Avenue, South
Nashville, Tennessee 37212

Society of Women Engineers
345 East 47th Street
New York, New York 10017

American Geological Institute
5205 Leesburg Pike
Falls Church, Virginia 22041

American Association of Immunologists
9650 Rockville Pike
Bethesda, Maryland 20014

History of Science Society
School of Physics and Astronomy
University of Minnesota
Minneapolis, Minnesota 55455

American Mathematical Society
Box 6248
Providence, Rhode Island 02904

American Medical Women's Association
1740 Broadway
New York, New York 10019

American Meteorological Society
45 Beacon Street
Boston, Massachusetts 02108

American Society for Microbiology
1913 Eye Street, NW
Washington, D.C. 20006

American Physical Society
335 East 45th Street
New York, New York 10017

American Pharmaceutical Association
2215 Constitution Avenue, NW
Washington, D.C. 20037

American Political Science Association
1527 New Hampshire Avenue, NW
Washington, D.C. 20036

American Psychological Association
1200 17th Street, NW
Washington, D.C. 20036

American Sociological Association
1722 N Street, NW
Washington, D.C. 20036