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THE JUNIOR HIGH SCHOOL PROGRAM IN INDUSTRIAL ARTS, A STUDY OF INDUSTRY AND TECHNOLOGY FOR CONTEMPORARY MAN.

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DESCRIPTORS- *INDUSTRIAL ARTS, *JUNIOR HIGH SCHOOLS, *PROGRAM DESCRIPTIONS, *EDUCATIONAL STRATEGIES, *TECHNOLOGY, INDUSTRY,

THE PROGRAM DEVELOPED BY THE UNIVERSITY OF MARYLAND IN COOPERATION WITH THE MONTGOMERY COUNTY SCHOOL SYSTEM IS DESCRIBED. IT IS AN ATTEMPT TO PUT EDUCATIONAL THEORY INTO OPERATION. IT FOCUSES ON AN EXPERIMENTAL-LABORATORY-FOR-PEOPLE CONCEPT AND EMPHASIZES THE INDIVIDUAL'S ROLE IN THE LEARNING PROCESS. IT HAS PUT THE PROCESS OF SELF-EDUCATION AHEAD OF TEACHING-AS-TELLING TO THE EXTENT THAT THE PROCESS OF OBTAINING THE ANSWER IS MORE IMPORTANT THAN THE ANSWER. THE SEVENTH GRADE PROGRAM HAS AN ANTHROPOLOGICAL BASE OF COMMON CULTURAL ELEMENTS AND UTILIZES THE UNIT-SEMINAR-CONTRACT-PROJECT APPROACH TO TEACHING. UNITS ON TOOLS AND MACHINES, POWER AND ENERGY, AND COMMUNICATIONS AND TRANSPORTATION FOCUS ON THEIR DEVELOPMENT AND THEIR CONTRIBUTIONS TO THE GROWTH OF CIVILIZATION. THE EIGHTH GRADE PROGRAM HAS A CONTEMPORARY APPROACH TO AMERICAN INDUSTRY AND USES THE GROUP PROJECT METHOD AND LINE PRODUCTION TECHNIQUES. THE NINTH GRADE PROGRAM TAKES INTO ACCOUNT THE PSYCHOLOGICAL NEEDS OF THE STUDENT, HIS RESOURCEFULNESS, CAPABILITIES, FUTURE ASPIRATIONS, PROBLEM SOLVING ABILITY, AND INGENUITY. IT ASSUMES THE NINTH GRADE LOCATION IN THE 6-3-3 SCHOOL PLAN AS WELL AS THE DEVELOPMENTAL TASKS ASSOCIATED WITH THAT AGE AND GRADE LEVEL. THE APPROACHES WHICH MAY BE USED ARE CONTEMPORARY UNITS, RESEARCH AND EXPERIMENTATION, GROUP PROJECTS, LINE PRODUCTION, AND TECHNICAL DEVELOPMENT BY GROUP OR INDIVIDUALS. A RELATED DOCUMENT IS VT 002 955. (EM)

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THE JUNIOR HIGH SCHOOL PROGRAM

In INDUSTRIAL ARTS - - A STUDY OF INDUSTRY AND TECHNOLOGY FOR CONTEMPORARY MAN

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1967

This discussion is a continuation of the presentation titled "Industrial Arts - - A Study of Industry and Technology for Contemporary Man". The specific content will center around the junior high school program that was designed to make Industrial Arts a "Study of Industry and Technology for Contemporary Man".

It is a junior high school program that has been developed in the Industrial Education Department at the University of Maryland in cooperation with the Montgomery County School System (Maryland).

The need for a junior high school Industrial Arts program based upon the idea of program and not a series of things to be made presented an interesting challenge. It was felt that the

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content and activities should be developmental and should be related to what precedes the junior high school, as well as what follows. But, more importantly, the processes (educational) should be directly related to what the individual is attempting to accomplish during the period of his junior high school years. This latter item has a strong bearing on the activities or experiences which contribute to the accomplishment of developmental tasks identified with the group.

The following diagram is a graphic portrayal of the content and methods associated with the program. The methodology and the content have been tried out over a period of years in a series of pilot situations in the Montgomery County Schools. At the present time, a major part of the junior high schools in the County are on this program. This has in a large measure, been facilitated by excellent support and leadership from the County as well as a fine cooperative teacher-education workshop which was operated through the Industrial Education Department of the University of Maryland.

Time and space in this presentation limit the discussion of this particular junior high school Industrial Arts program to the following remarks.

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THE JUNIOR HIGH SCHOOL PROGRAM

IN

INDUSTRIAL ARTS

Developed by

The Industrial Education Department

of the University of Maryland

7 th GRADE

An Anthropological approach to the study of certain basic elements common to all civilized mankind

Approach--The Unit Method

Units:

(1) Tools and Machines
(2) Power and Energy
(3) Communication and Transportation

8 th GRADE

A Contemporary Approach to the study of American Industry

Approach--Group Process

(1) The in-depth study of an industry using the group project approach.
(2) The in-depth study of industry using the line production approach.

9 th GRADE

Personal

Emphasis on the psychological needs of the individual as well as his resourcefulness.

Content

Emphasis on Contemporary Units of study, increased depth of study in industry, and greater understanding of problems of industry.

CONTEMPORARY UNITS

RESEARCH AND EXPERIMENTATION

GROUP PROJECTS

LINE PRODUCTION

TECHNICAL DEVELOPMENT (group or individual)

Capability, problem solving, ...

It is a program that has been designed to take advantage of or make use of the following:

1. the integration of mathematics, science, communications, and the social sciences into the Industrial Arts activities,

2. the maximum use of the community resources extending from the total school to the state, national and even international sources,

3. the use of a wider range of reading materials at all levels of difficulty and sophistocation,

4. the extensive use of inquiry, problem solving and experimentation in the arriving at solutions and procedures to follow,

5. the effective and meaningful use of "role playing" as a technique for greater student involvement and direction by the student,

6. the extensive use of a broad range of student activities that go far beyond the making of objects; the contriving of activities and experiences that will permit a diversity of involvement, a greater display of talents, and a greater use of the individual's special abilities, and finally,

7. the development of experiences in keeping with the behavioral characteristics and developmental tasks of youth.

The seventh-grade program is based upon an anthropological approach to a study of certain basic elements common to all civilized mankind.

It uses the unit-seminar-contract-project approach to teaching.

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The units are as follows:

1. The Development of Tools and Machines and Their Contribution to the Growth of Civilization.

2. The Development of Power and Energy and Their Contributions to the Growth of Civilization.

3. The Development of Communications and Transportation and their Contributions to the Growth of Civilization.

The units are extablished for the seventh grade program, and each student selects his specific project and sub-topic that will contribute to the total unit topic. He does his own research, investigation, planning, construction, and presentation. Each presentation is made in a seminar setting as opposed to the usual up-front class presentation. Each student is encouraged to use his ingenuity, and full range of capabilities in the development of his written and constructional contribution. Each is encouraged to explore fully the range of community resources available to him in his pursuit of his part of the contract to contribute to the unit topic.

The eighth grade program is a contemporary approach to the study of American Industry. It uses the group project and line production techniques of teaching in the group process approach to methodology.

(1) The group project involves an in-depth study of modern

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industry. This particular approach is aimed at studying an industry using a project-industry as an industry-organization format. Such an industry organizational structure would be similar to those that are involved in the Apollo Project, Mercury Project, etc. The project-industry organizational format is used only from an organizational point of view, but the industries studied may include steel, paper making, aluminum, copper, coal,oil, plastics, etc.

The end product from the constructional activity is a major project of considerable size, complexity, and ingenuity. The large project is supplemented by additional products produced by the students in the pursuit of their roles on the personnel organization plan.

The students organize into a functional line and staff (project orientation) personnel plan comparable to those used in contemporary industry. This is in essence the organization of people to accomplish a major industry study. The positions would include such titles as project director, research director, industrial director, personnel director, safety director, construction engineer, project coordinator, electronics engineer, design engineer, public relations director and many more. Each position

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represents an area of student responsibility, as well as an area of meaningful role - playing.

The role - playing involvement is a major factor in the group project. It also provides for a wider interpretation of the organization, procedures, problems, and contributions of industry. This role - playing activity enlarges the realm of student participation in keeping with his interests, aspirations and capabilities. It also establishes the setting for the exercise of authority, responsibility, and leadership on the part of the student. The social interaction and peer culture relationships make this personnel organization an invaluable component of the total process.

The major project is the result of student ingenuity, planning, construction, problem solving, social interaction, and the boundless application of resourcefulness on the part of the class.

(2) The second form of group methodology uses the line production technique to make an in-depth study of the volume producting industries with their organizations, problems, products, processes and contributions.

The value of this latter approach is highly dependent upon the degree to which the teacher sees it as an experiential opportunity involving organization, role playing, financing and econ-

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omics, ownership, planning, designing, public relations, tooling-up, quality control, labor relations, occupational studies, sales, stocks, communications, etc.

Here again, the resourcefulness of the students in seeking outside-the-laboratory assistance and advice is encouraged. The total school, and community should become the sources of help for the student as well as the teacher.

This is <u>definitely not</u> a case where the teacher does the planning, jig-making, the problem solving and the supervising. It is a student enterprise that has few limits in the realm of human opportunities to grow, to explore, to test, and to gain a greater understanding of contemporary industry.

The eighth grade study of contemporary industry is intended to assist the student in developing concepts related to the broader aspects of the subject such as:

1. concepts related to the organization of industry,
2. concepts related to productivity,
3. concepts related to occupational opportunities,
4. concepts related to mechanization,
5. concepts related to automation and cybernetics,
6. concepts related to labor-management relations,
7. concepts related to the financial structure of industry, and

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8. concepts related to the changing role of the individual in industry.

The ninth grade program is aimed at a different level of individual as well as a different level of study. It is based upon a concept of the location of the ninth grade in the 6-3-3 school plan as well as the developmental tasks associated with that age and grade level.

Basically, the content centers around contemporary units of study, increasing depth of study in industry, and a greater understanding of the problems of industry. From the human needs point of view, it is a multi-pronged approach taking into account the psychological needs of the individual, his resourcefulness, capabilities, future aspirations, problem solving, and ingenuity.

The specific approaches that may be used at this level include - - -

(1) contemporary units,

(2) research and experimentation,

(3) group project study of industry,

(4) line production study of industry,

(5) technical development (group or individual).

The ninth grade program includes the research and experimentation program as another possibility for student activity. This

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is a program that has had a great deal of acceptance and recognition since its first development at the University of Maryland in 1952 and especially since its introduction into the public schools in 1959.

The "Research and Experimentation" approach is basically an attempt to put into practice what the best of educational psychology and practice tends to advocate. The program is an individual-centered approach with the scientific method of problem solving being the principle element. It is a program that starts with the curiosity of youth and then proceeds through a well ordered inquiry based upon acceptable research procedures. The problems are all selected by the students, and special emphasis is placed upon this fact. This is a student-centered approach. It is the student's curiosity that provides the momentum for the program. Teachers that insist on selecting problems for the students to work on, and published booklets that suggest a guided series of experiments for the student, have no part in this program. It is at this point where many teachers are unable to visualize and perform a role that takes them out of the "telling," "lecturing," "demonstrating," and "assignment making" kinds of teaching which have dominated their education all of their school years.

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The pursuit of the problem by the student involves the development of a scientific approach to the object of his curiosity. He learns and practices the techniques of research. He uses the language of research--statements of problems, hypotheses, assumptions, variables, findings, and conclusions. He soon learns that reading, letter writing, telephoning, visiting, interviewing, and observing are some of the tools he can use in gaining the information he needs. And, above all, he soon learns that the sources of information may take him beyond the teacher, beyond the other teachers in the school, and beyond county, state or national boundaries.

During the days and weeks of research, constructing the necessary apparatus, and developing the experimental objects, a series of seminars are held to provide for a system of communication and an opportunity for challenge among the young researchers. It is here, in the seminars, where the communication skills are developed and the opportunity for the unique talents of each to contribute to others is made a reality. The seminars provide a sounding board for problems, ideas, sources of information, and the completeness of the research. These seminars have become one of the most important phases of the program.

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The individual project or technical development phase is another selection open to the teacher. He may wish to engage in this form of activity after he has made a thorough study of the needs, aspirations, characteristics, and capabilities of the student.

These experiences may range from the simplest of tool and manipulative experiences to highly technical work in the areas of numerical control, metallurgy, material technologies, bonding and adhesive studies, forming processes and automated control devices. The range of opportunities are present, and the nature of the experience again lies in the point of view and concept of education (Industrial Arts) held by the teacher.

It is of vital importance that the teacher again be a "manager of education" and not a dispenser of facts. The teacher's role should center around those actions that promote maximum student growth and development through timulation, guidance, evaluation, and facilitation.

The development of the art of "learning to learn," of resourcefulness, problem solving, and self dependency should be encouraged. The process by which one gets his answers remains a matter of central focus.

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The above brief outline of the projected junior high school (an actuality in a number of schools) is based upon some of the issues that were presented earlier. It is an attempt to put educational theory into operation. It has had an excellent acceptance by some of the most outstanding educators of the day.

But, more fundamental than its acceptance or plaudits, the program has focused on an experiential- laboratory-for-people concept. It has emphasized the individual's role as well as his differences in his engagement in the learning processes. It has put the process of self-education ahead of teaching-as-telling to the extent that the process whereby the answer is obtained is more important than the answer that is achieved. It is based upon a concept of education through inquiry rather than the memorization of isolated facts.

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