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APP Science in Davenport

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their general attitude towards the rest of their high school work, and to see if they enter into science related fields; to find out if they do as well or better in college science courses than students who were not involved in this program.

We are talking about a program of science that involves performance and creative art. We are not concerned at this point with our basic program of technical and mechanical know how. We have this well under way. Our need is for stimulation of talent to perform beyond the boundary of the classroom. This is how the scientist

buds and blooms. We need not worry to a large degree whether the student will get or not get a great deal of substance from this work. Those who cannot, will not . . . ; those who care not, will not . . . ; those who wish to know and will pay the price will benefit beyond words.

The experience gained in working to produce people who are interested in science has shown that there are few who can work independently. Those who can, will, and are eager to do so without constant surveillance. We wish to offer these youngsters their chance.

APP Science in Davenport

WARREN CLASSON

Davenport

Advanced Placement Program Biology was introduced at our Davenport Central High School last fall. This course, taught at a college freshman level, is designed to correlate with the APP operated by the College Entrance Examination Board.

The introduction of this course into our secondary science curriculum represents the culmination of a plan originated several years ago to meet the special needs in science of our capable students. In the fall of 1960 we made biology available to selected ninth grade students in one junior high school, and in 1961 this program for selected students was placed in operation at all of our junior high schools. During succeeding years many of these students have progressed through chemistry and physics a year earlier than the "typical" student. Each student's records and capabilities were carefully evaluated before he registered for each course in the sequence. If experience with the student merited it, he was encouraged to progress in the accelerated sequence. In a case where potential and student achievement were not compatible, the student was counseled relative to making modifications in his program which would better fit his needs. Prior



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to the student's registration in APP Biology, his records were again carefully evaluated; and he was invited to apply for enrollment.

Mr. Frank Gorshe, Central High School Science Department Head, was given the responsibility for developing the course and was allowed time with pay during the summer of 1963 for this purpose. The Coordinator of Science obtained freshman biology courses of study from colleges and universities and APP courses of study from high schools to build a resource of content and ideas from which Mr. Gorshe could draw. In addition, the suggested course description published by the College Entrance Examination

Board was placed at Mr. Gorshe's disposal for general ideas on what is typical in the way of a freshman biology course in many colleges and universities. Also, Mr. Gorshe visited the State University of Iowa to discuss the course with University personnel.

The course of study which is evolving this first year at Central High is based upon three major convictions:

1. Biology is a logically coherent structure and not a synthesis of zoology and botany.

2. The continuity of life as a scientific concept is most understandable when comprehended as a continuity of change.

3. The most logically systematic approach to the study of biology depends on advancing from an enlarging central core of common knowledge and observations.

These three convictions are being placed into practice through integrating selected topics around a central theme—evolution. This theme is working well as the students involved are capable and they have had successful experiences in the high school science courses as a background. With qualifications of this nature, the students are able to study college freshman biology, unified through evolution as a theme, with understanding and with a high level of interest.

The class in APP Biology is scheduled during the final period of the school day so students can continue their laboratory experiences, uninterrupted, beyond the confines of the fifty-five minute period. Laboratory experiences are not held just in the biology labs, but the chemistry lab is also used to good advantage. Work in the laboratory is an important integrated part of the course, and the laboratory sessions are scheduled as closely as possible according to need, rather than by the day of the week.

Another important feature of the APP Biology course is its emphasis on science reading. Each student does considerable research reading on a topic of his own choosing. After he has had an opportunity to develop his knowledge through reading, he orally presents the results of his study to the class. Following the presentation, he

carries the responsibility for leading the group discussion which results.

We are now turning our attention toward the expansion of APP science offerings in our high schools. It is anticipated that we will offer biology and chemistry on this level at both Central and West High Schools next fall. Mr. Jack L. Hudson, Chairman of the West High School Science Department, is developing a course of study for APP chemistry during the current semester. His teaching schedule has been reduced to allow time for this activity. Also, the same types of aids which were provided for Mr. Gorshe's use in developing APP Biology have been made available to Mr. Hudson. The APP Chemistry course will be scheduled during the final class period of the school day for the same reasons that APP Biology is scheduled at that time.

There are several programs which can be offered to meet the needs of capable, science oriented students. Among these, some programs may em-



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phasize unification of the sciences; some may keep the usual grade by grade offerings with an emphasis on enrichment; and the others may emphasize all of the basic sciences through units taught on a higher level. Each of these programs has its merits, but APP has some special advantages:

1. Capable senior students can do regular college freshman work if they have developed a good foundation from their high school science courses.

2. APP science students may take an advanced placement examination. Good re-

sults on the examination can mean the granting of college credit and or advanced placement.

3. The experience of taking college work in high school can help to ease the adjustment these students must make to college.

4. APP Science courses have a stimulating effect on capable students not only for those taking the courses, but for underclassmen who are looking ahead. In Davenport we have chosen APP

sciences over other programs for these reasons.

References

Advanced Placement Program's Course Descriptions. College Entrance Examination Board, Princeton, New Jersey, 1962. 1962.

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Team Oriented Research in the High School

D. N. WEST

Fontanelle

The purpose of this article is to describe a method used by the author to introduce a group of high school students to the research method. The initial search of literature and type of experimentation always require much expenditure of time and effort. Beyond a doubt the most consuming part of the entire investigation is verification of data



West

obtained.

The author has always been of the opinion that many investigations would move faster and smoother if one person would act as a liason or proctor for the entire group. Rather than have the students working individual problems, they were each assigned portions of one large investigation.

This investigation could well be titled "Effects of a Varied Environment on Pigment Production in Plants." Cuttings were taken from the parent plant and placed in water till an adequate supply of roots were developed. An abundant supply should be secured since it requires three or four plants for each participant.

This team approach consisted of every member submitting his portion of the plants to a varied conditions.

These individual inquiries performed by the students were as follows:

Effects of light variation in the ratio of three hours light to three hours darkness.

Effects of light variation in the ratio of one second darkness to three seconds light.

Effects of gradient solutions of detergents.

Effects of exposure to ultraviolet light.

Effects of nitrogen fertilizer.

Effects of gibberillic acid.

Effects of varying degrees of dryness.

To measure the effects of these variations on pigment production, a paper chromatographic approach was initiated. This type of technique was soon abandoned as the results obtained left much to be desired in terms of a quantitative exercise. However, the different types of pigments were readily separated. A modification of this technique to determine which individual pigment is affected may well serve as a basis for future investigations.

A spectrometer was used to measure the degree of density. The local hospital was kind enough to allow the author access to this instrument. The amount of light that can pass through a given solution, as compared to a standard of methyl alcohol, is registered and read as degrees of transmission from one to one hundred. A normal curve was plotted using grams of leaves per twenty ml. of methyl alcohol, boiled in a water bath for ten minutes. Before being placed in the alcohol bath, the leaves were cut with scissors into fine strips approximately