

The Science Seminar in Senior High School

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The second year biology course is a subject for much variation in approach. The author, a graduate student and president of the campus biology club, describes the seminar approach for a second year course utilizing also projects.

During the past decade there has been growth in high school biology programs in the direction of advanced techniques of science teaching and a consciousness of providing activities for students who have an interest and an aptitude for work beyond the introductory biology course. The situation of science programs in American high schools today usually consists of a freshman or sophomore biology class, a junior chemistry class, and a senior physics class. General science may be given in the freshman year. Chemistry and physics may be offered during the junior and senior years respectively.

Classes in natural and physical sciences give to the student the needed basic introduction to biology. The advantage of having a seminar in biology in the senior year is not for the purpose of advanced research; instead it is a means by which a student can explore biology in order to provide the stimulus of interest he needs in choosing a college major in the field of biological sciences. To promote a life-time interest and activity then is the major purpose of the seminar biology program at Riverside Brookfield High School, Riverside, Illinois. At this high school a student must have received a "B" or an "A" in his first biology course and must be recommended by his teacher for senior seminar. The junior who is contemplating admittance to the seminar class in his last year must be doing average work or better in chemistry or physics. Although chemistry and physics are not prerequisites, most students entering seminar have this background.

The projects carried on by seminar students usually are directly linked with a chemical and physical science. Such projects as gibberellic acid treatment on the common garden pea, or plant growth and colchicine experiments, require some knowledge of chemistry.

At Riverside Brookfield High School the procedure in the seminar is to let the student

choose a project by himself to be worked on during the year. His work is discussed with the rest of the class and the instructor in the seminar group. Usually the seminar discussion is at the end of the week. Questions are asked, and the student tells what he has accomplished during the week. The discussion usually leads to topics of interest to the students.

The teacher acts as a guide in the program for each student. His role is to help out whenever the student comes to him with questions. He may suggest projects for the student. He allows the student to work at his own speed with minimum instruction. Instruction is only given when asked for by the student. The teacher may counsel during the discussion period. The purpose of this role is to allow maximum individual effort to be put forth on projects by each student. There is no deadline to meet in finishing a project except the end of the school term. Neither is there science fair competition. Thus, the student is free to work at his own speed. Group seminar competition and the privilege of being in a selected group are the incentives needed for doing a good job.

Some projects worked on by students in seminar during the 1959 school year were plant growth experiments on the garden pea, plant chromosome doubling with the use of colchicine, mice nutrition, cat and rabbit dissections, rocket construction, rat heart stimuli with electrodes, and hypnogenesis. Cat dissections were done with supply specimens as well as with dead cats found but not badly damaged.

At the end of the school year a complete report was required by each student regarding his project. This report was typed and given orally to the class. Demonstrations were given during the oral reports.

The complete class project terminating the school year included movies of each project or experiment explained by the student who

did the work. Since a 8 mm movie camera was used, each project was outlined in chalk on the blackboard as a substitute for sound explanation. The purpose for recording the work was for use in future seminar classes.

The design of the Science Seminar pro-

gram at Riverside Brookfield is an example of the experience approach. It is pupil centered. This allows for pupil creativity and ego involvement. It encourages cooperation among pupils while it develops individual reasoning and responsibility.

“It Says On My Report Card That I Have Had Biology”

• *Dorothy Branson, 1745 Anderson Avenue, Manhattan, Kansas*

Every teacher has some real “bloopers” to report, but the author has compiled an interesting list for publication. The Editor recalls one he received on a test: Identify Freud: Something they do in the Kentucky mountains.

Once upon a time, a new City Recreation Director was hired by a smallish community, and upon reporting for work discovered to his annoyance that he was also to coach the high school football team. This he reluctantly agreed to, and did quite competently. But he had not been at work very long before he discovered further that he was also to have several academic classes at the high school, including biology. He protested about this at length but in vain, and found himself, knowing very little about biology, teaching students who knew only slightly less and who had, by and large, the same degree of enthusiasm for it.

After one and two-thirds semesters of being City Recreation Director, high school coach, and biology teacher, he left suddenly for a less nerve-racking (we hope) job, and I inherited his biology class for the last third of the second semester. Since I *am* a biologist, the change was a shock for his students; they had been told, among other things, that they need not learn any word over two syllables long, since he didn't know them either. If you will give a moment's pause, you will realize that their knowledge of biological facts and principles must have been more than slightly inadequate, since biology regrettably seems to have more long words than short ones.

“Coach” had given them all fairly good grades for the most of the year, so I could not mathematically fail the entire class, or even very many of them; but it almost broke my heart to send those students out into the world thinking they knew some biology. The final unit was on reproduction, and I

very nearly wept over the examination answers.

Those answers seem much funnier in retrospect, however, and I share the choicest of them with you in a spirit of pure fun instead of “read 'em and weep.” After all, if I had had a class of mathematics foisted off on me, I could have set the space age back 10 years. It is obvious that some of the students could not even *copy* the correct spelling; one poor shook-up boy went so far as to misspell his own name. On the other hand, my very excellent high school biology teacher once collected 17 ways of misspelling “metamorphosis” in one semester. And it is not only high school students who got confused; I once graded a college botany paper which contained the following definition of the Machine Age: “The Age in which we live, when people and products are manufactured rather than grown on farms or gotten directly from nature.”

The following, however, are my high school “gems”:

Ways of spelling nucleus: neucluse, necleus, nuclues, mucales, nucus, nucleous, nuceus, neuclar, muclues, nuclas, neoculas, necleus, necula

Method of reproduction of the ameba: biner effician

binary efficiency

Organisms reproducing by sporulation: ambea, nuclues, firm, the beard mole

Organisms reproducing asexually: birds and humans

Definitions:

Breeding: fertitization of games