

6-1-2000

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Recommended Citation

Schinzel, D. D. (2000). Advanced Placement Science Programs in Catholic High School. *Journal of Catholic Education*, 3 (4). Retrieved from <https://digitalcommons.lmu.edu/ce/vol3/iss4/2>

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ARTICLES

ADVANCED PLACEMENT SCIENCE PROGRAMS IN CATHOLIC HIGH SCHOOLS

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The purpose of this study was to examine the Advanced Placement (AP) science programs in participating Catholic high schools and develop guidelines for the implementation of similar programs at other Catholic schools. The areas of interest were curriculum, instruction, and Advanced Placement examination results. Administrators and teachers at Catholic high schools with Advanced Placement science programs were surveyed using instruments developed by the researcher. The responses of AP teachers and administrators were analyzed and compared in order to determine important features of existing science programs.

Science curriculum and instruction in secondary schools are continually evolving in order to ensure that students are prepared to meet the demands of a society that is becoming more and more reliant on information and technology. The Advanced Placement Program administered by the College Board is one means of providing a demanding science curriculum for high school students. The program is designed to give qualified high school students the opportunity to receive college credit for courses completed in the high school setting (College Board, 1998a). Such a program calls for quality instruction, challenging curriculum, and high standards of performance.

The science program offered by the College Board encompasses three areas: biology, chemistry, and physics. Although there is no set Advanced Placement (AP) curriculum in any of these subjects, the College Board provides support services and resources for participating schools and instructors (College Board, 1998a, 1998b, 1998c). These include teachers' guides in each subject, course outlines, suggested textbooks and labs, examination information, and other types of support. The College Board also sponsors

workshops and summer institutes for teachers of AP. Each course is ultimately driven by the culminating examinations that the College Board offers in each of the subjects. These examinations are the means by which students can qualify for college credit and, as a result, provide direction for the courses (Crouse & Trusheim, 1988; Herr, 1992). The College Board publishes past examinations for use by participating schools.

The availability of AP courses in science is increasing. As a result, many more students are becoming involved in the program. Further expansion of the program not only will affect those students and teachers directly involved, but will also have a positive impact on the entire secondary school science program (Crouse & Trusheim, 1988). Adding AP courses provides standards that can drive improvement in curriculum and instruction in prerequisite science courses (Herr, 1990).

Advanced Placement programs exist in both public and private secondary schools. The College Board offers its services to any qualifying institution, regardless of its affiliation. Catholic high schools are the most prevalent non-public institutions offering AP courses (College Board, 1998c). While much research has focused on the quality and effects of Advanced Placement science instruction, there is little, if any, research on the quality of Advanced Placement science programs found in Catholic schools.

PURPOSE

The purpose of the study was to examine the Advanced Placement science courses that exist in Catholic secondary schools participating in the Advanced Placement program and establish guidelines for the implementation and development of similar programs at other Catholic schools. The particular areas of interest are curriculum, instruction, and examination results. By focusing on these three areas, the study seeks to provide a balanced analysis of the science programs at Catholic schools currently participating in the Advanced Placement Program.

RESEARCH QUESTIONS

1. What is the availability of the various science courses in the Advanced Placement program at the participating Catholic schools?
2. Do the Advanced Placement science courses use the teachers' guides, course outlines, and textbooks suggested by the College Board for each of the areas of study?
3. What type of educational background do teachers of AP science programs in Catholic schools have and how important is this background in providing quality Advanced Placement science instruction?

4. How much teaching experience and Advanced Placement teaching experience do AP science instructors in Catholic schools have and how does it affect instruction as perceived by instructors and administrators?
5. Are teachers of Advanced Placement science courses in Catholic schools given lighter teaching loads in keeping with the recommendation of the College Board?
6. What percentage of students enrolled in Advanced Placement science courses at Catholic schools take an examination?
7. What is the rate of success of those students in Catholic schools who take an Advanced Placement examination in science?
8. What role does the Advanced Placement examination play in the evaluation of science instructors at Catholic schools?

REVIEW OF LITERATURE

The literature concerning the Advanced Placement science program and Catholic schools that is pertinent to this study falls into four distinct categories: 1) background and rationale of the Advanced Placement Program, 2) students and the Advanced Placement Program, 3) teachers and the Advanced Placement Program, and 4) Catholic schools and the Advanced Placement Program.

BACKGROUND AND RATIONALE

The Advanced Placement Program has existed for over 40 years under the supervision of the College Board. The program was initiated to provide college-level coursework for highly talented and motivated high school students (Nyberg, 1993). Initially, the program was limited in scope, focusing on a few disciplines and involving only those students enrolled at select secondary institutions. The Advanced Placement Program has undergone immense growth and now includes over 10,000 secondary schools (College Board, 1998a).

The College Board, in association with the Educational Testing Service, writes and administers examinations that cover material in 29 courses. These content-specific examinations are the sole method used to evaluate students and determine whether they qualify for college credit (Mercurio, Lambert, & Oesterle, 1984; Snow, 1984).

Each college or university sets its own policy regarding the awarding of credit based on AP examination results. The College Board collaborates with the 2000 participating colleges and universities to ensure that the program is meeting their needs. University faculties are involved in all aspects of the program, including the writing of the examinations.

STUDENTS AND THE ADVANCED PLACEMENT PROGRAM

Because no set criteria exist for admission into an Advanced Placement course, each secondary school is free to develop its own policy (Nyberg, 1993). Some schools select students based on grade and pretest criteria, while others open the program to all interested students. The College Board provides some suggested guidelines for the selection of students in the course descriptions.

The increasing number of students involved in Advanced Placement programs, particularly in science, indicates that selection policies are changing. Herr (1990) suggested that the increased student demand for the courses resulted in more liberal admissions standards for most programs. He attributed this demand to the extrinsic rewards of the program such as college credit and advanced standing in college.

Participation in AP courses promotes self-efficacy and high self-expectations on the part of the students (Casserly, 1968; Herr, 1990). Levin (1981) found that students involved in higher-level science courses such as Advanced Placement had more positive attitudes toward school and science. Timoney (1993) found that the program leads students to a greater respect for education and a greater willingness to accept responsibility for learning.

Participation in the Advanced Placement Program is an effective predictor of success in college. Burnham and Hewitt (1971) found that AP students were more productive as freshmen than those without such experience in high school. Ferko (1989) showed that college students with Advanced Placement experience outperform those students without such experience on subject-specific achievement tests. Chamberlain, Pugh, and Schellhammer (1978) used grade comparisons to demonstrate that AP students achieve at a higher level academically in college than students of equal ability who do not have an Advanced Placement background.

TEACHERS AND THE ADVANCED PLACEMENT PROGRAM

The College Board has placed a heavy emphasis on formal and informal teacher education. As a result, teachers of AP courses tend to have a thorough background in professional development. Advanced Placement instructors have more educational training than their peers (Herr, 1990; MacGregor, 1975). This educational training is more likely to be in the specific content area in which they are teaching (Bodenhause, 1989; Herr, 1990). Since the College Board sponsors subject-specific workshops, it is not surprising to find that a vast majority of Advanced Placement teachers indicate that they have been involved in professional development workshops and conferences (Timoney, 1993).

The accountability of the Advanced Placement Program is partially responsible for the high level of professional growth among its instructors. When students receive low grades on an examination, teachers are often impugned by students, parents, and administrators (Bodenhause, 1989; Herr, 1992; Warren, 1984). Bodenhause (1989) found that students who do not achieve a qualifying score on an examination are more likely to have had a teacher with a weak training background.

The proliferation of the program in recent years means that more teachers are becoming involved in Advanced Placement instruction. One of the advantages of teaching AP courses is the opportunity to work with motivated students with exceptional talents (Nyberg, 1993). As a result, these teachers are often more demanding of themselves and their students and tend to put more time and effort into their AP courses (Casserly, 1968; Herr, 1990).

CATHOLIC SCHOOLS AND THE ADVANCED PLACEMENT PROGRAM

The College Board does not keep statistics on the number of Catholic schools offering Advanced Placement courses. The only measure of course availability lies in the statistics on the number of students taking examinations in each subject. Coleman, Hoffer, and Kilgore (1982) found that Advanced Placement Programs appear in about the same proportion of Catholic and public high schools.

Many studies have examined the overall academic programs in Catholic schools. Students in Catholic schools are more likely to be taking an academic track program than their public school peers (Bryk, Lee, & Holland, 1993; Hoffer, Greeley, & Coleman, 1985; Murnone, 1981). Therefore, more students have the opportunity to be involved with a challenging, college preparatory program of study. Students in Catholic schools are also more likely to have college ambitions than their peers in public schools (Hoffer, Greeley, & Coleman, 1985). In addition, college students with a Catholic educational background show greater success once they are in college (Coleman & Hoffer, 1987).

Staffing has long been an issue in Catholic education. Economic constraints make the recruitment and retention of quality teachers with extensive teacher training a challenge for the Catholic school administrator. Many educators, as well as many in the general public, perceive Catholic school teachers as less qualified than their public school counterparts (Hoffer, Greeley, & Coleman, 1985). As a result, the availability of Advanced Placement courses in Catholic schools is very much influenced by professional staffing.

METHODOLOGY

The two populations under consideration were administrators of Catholic high schools that had Advanced Placement science programs and teachers of Advanced Placement science courses in these programs. The study focused on participating Catholic schools in a geographic area that is under the supervision of the Midwestern Regional Office of the College Board.

From data provided by the College Board, 81 Catholic high schools were identified as having had one or more students take an AP examination in biology, chemistry, or physics. Administrators of all 81 participating Catholic high schools were surveyed using an administrator questionnaire developed by the researcher. Many of the schools had Advanced Placement courses in more than one of the three science disciplines. All teachers of these Advanced Placement science programs were sent teacher questionnaires.

INSTRUMENTATION

The two survey questionnaires (see Appendix) designed for this study were developed under the advisement of a panel of experts in the field of curriculum and instruction. The *Survey of Advanced Placement Science Instructors* consisted of demographics items, opinion items, and data items. While encompassing all the areas of study, the survey focused primarily on instructional issues. The *Survey of Administrators at Schools with Advanced Placement Science Programs* consisted of demographics and opinion items. Specific attention was paid to issues most relevant to administrators, such as evaluation of instruction, teacher professional growth, and budget.

To ensure the validity of both questionnaires, a panel of experts participated in the process of developing and revising the instruments. The panel consisted of a professor of education, a Catholic high school principal, an Advanced Placement coordinator, and an experienced Advanced Placement instructor. Through the recommendations of this panel and a careful review of the literature, items were evaluated on the basis of whether they were valid measures of the objectives of the study.

A pilot study involving the administrators and instructors in six Nebraska Catholic high schools with Advanced Placement science courses was administered to obtain reliability data. Participants in the pilot were asked to complete the questionnaire and make comments about its wording, appearance, and organization. The data were used to revise the instruments. The internal consistency of the final instruments was measured using Cronbach's alpha. An alpha coefficient was determined for questions concerned with curriculum and instruction for each of the surveys. The alpha coefficients for curriculum were .75 for the administrator survey and .71 for the teacher survey. The alpha coefficients for instruction were .65 for the administrator survey and .76 for the teacher survey.

RESULTS

Questionnaires were distributed to all administrators and teachers involved in Advanced Placement science programs at Catholic schools in the Midwestern Region of the College Board. Sixty-six of 81 administrators returned the questionnaire, for a response rate of 81.5%. A total of 83, or 74.1%, of the 112 teachers in the population returned the questionnaire.

Data from the *Survey of Advanced Placement Science Instructors* and the *Survey of Administrators at Schools with Advanced Placement Science Programs* were analyzed separately. Both surveys contained quantitative and qualitative data. The data were organized into four categories: demographics, curriculum, instruction, and Advanced Placement examination results.

The Mann Whitney U—Wilcoxon Rank Sum W Test was used to compare administrator and teacher responses to items that were common to both questionnaires. This test is the nonparametric equivalent of the t test and is used when parametric assumptions about the populations cannot be made (Best & Kahn, 1989; Sincich, 1993). The alpha level of .05, widely employed in educational research, was used for determining significance. In order to reduce the risk of a Type I error, the Bonferroni procedure was used (Sincich, 1993). The overall alpha level of .05 was divided by the number of comparisons. The resulting .004 level was then used for each comparison.

Data from on-site visitations were presented along with the survey data. Background information and observations from each site were compiled and organized into the aforementioned four categories.

DEMOGRAPHICS

Table 1 shows the breakdown of administrator respondents according to the self-described setting of their school (urban, suburban, or rural). Suburban schools represent the largest percentage (49.2) while rural schools make up a very small percentage (12.3) of the total respondents.

Table 1
Survey Responses According to Self-Described School Setting

Setting	Number Responding	Percent of Total
Urban	24	36.9
Suburban	32	49.2
Rural	8	12.3

The administrator survey also asked respondents to describe their school as coed, all girls, or all boys. Survey responses according to school type are presented in Table 2. Just over half the administrators identified their schools as coed. All-girl schools made up 18.5% and all-boy schools made up 27.7% of respondents.

Table 2
Survey Responses According to School Type

Type of School	Number Responding	Percent of Total
Coed	35	53.8
All Girls	12	18.5
All Boys	18	27.7

Administrators were also asked to classify their school according to size (Table 3). Almost three-quarters of the administrators came from a school of 500 or more students. The largest percentage of the respondents came from schools of between 500-750 students (32.3%) while the smallest percentage came from schools of 250 or fewer students (7.7%).

Table 3
Survey Responses According to School Size

Size of School	Number Responding	Percent of Total
250 or less	5	7.7
251-500	12	18.5
501-750	21	32.3
751-1000	13	20.0
1001 or more	14	21.5

CURRICULUM

The availability of Advanced Placement science courses at the participating schools can be measured according to the number of courses offered at the individual schools. Since the Advanced Placement science program consists of biology, chemistry, and physics courses, participating schools could offer one, two, or three courses in any given year. Table 4 provides data concerning school size and number of course offerings. Schools of 500 or more students are much more likely to have multiple Advanced Placement science courses.

Table 4
Number of Advanced Placement Science Courses by School Size

Size of School	Number and Percentage of Schools With		
	1 Course No. (%)	2 Courses No. (%)	3 Courses No. (%)
250 or less	3 (60.0)	1 (20.0)	1 (20.0)
251-500	8 (66.7)	3 (25.0)	1 (8.3)
501-750	7 (33.3)	10 (47.6)	4 (19.1)
751-1000	5 (38.5)	6 (46.1)	2 (15.4)
1001 or more	5 (35.7)	5 (35.7)	4 (28.6)

Both administrators and teachers were asked whether they thought their school was meeting student demand for the three science courses in the Advanced Placement program. A Likert scale was used for this item (1=*strongly disagree*, 2=*disagree*, 3=*agree*, 4=*strongly agree*).

Table 5 shows the mean score and standard deviation for both administrator and teacher responses. In both cases, the respondents generally agree that their schools are providing students with adequate Advanced Placement science courses.

Table 5
Ability of School to Meet Student Demand for Advanced Placement Science Courses as Perceived by Administrators and Teachers

Response	Administrators		Teachers	
	Mean	SD	Mean	SD
I think the availability of Advanced Placement science courses at our school adequately meets the student demand.	3.215	.780	3.272	.671

Scale: 1=*strongly disagree*, 2=*disagree*, 3=*agree*, 4=*strongly agree*

Data regarding the use of curriculum materials and resources provided by the College Board are presented in Table 6. Teachers were asked to use a Likert scale ranging from 1 (*not important*) to 5 (*extremely important*) to describe the relative importance of each of the listed curriculum resources. Past Advanced Placement examinations had the highest mean score (4.086), while teleconferences had the lowest (1.838).

Table 6
Relative Importance of Available Advanced Placement Curriculum Materials

Curriculum Source	Mean	SD
Advanced Placement Course Outlines	3.506	1.062
Advanced Placement Teacher's Guide	3.272	1.096
Recommended Textbooks	3.099	0.970
Past Advanced Placement Examinations	4.086	1.015
Advanced Placement Teleconferences	1.838	0.999
Advanced Placement Workshops	3.150	1.104
Recommended Lab Topics	3.358	1.133

Scale: 1=*not important*, 2=*somewhat important*, 3=*important*, 4=*very important*, 5=*extremely important*

INSTRUCTION

Information about the educational background of Advanced Placement science teachers in Catholic schools is presented in Table 7. Over three-quarters of the teachers indicated they had a master's degree or higher while less than one-fourth indicated that their highest degree was a bachelor's degree.

Table 7
Highest Academic Degree Received
by Teachers of Advanced Placement Science Courses

Highest Degree	No.	%
Bachelor's	18	22.2
Master's	60	74.1
Specialist	1	1.2
Doctorate	1	1.2

Administrator and teacher responses to statements regarding the influence of teacher educational background on instruction are presented in Table 8. In both surveys, respondents were asked to indicate how important each of three educational backgrounds is in preparing instructors to teach Advanced Placement science courses. The survey uses a Likert scale ranging from *not important* (1) to *extremely important* (5). Mean scores and standard deviations for the administrators and teachers are listed.

Table 8
Influence of Teacher Educational Background on Instruction
According to Administrators and Teachers

Type of Background	Administrators		Teachers	
	Mean	SD	Mean	SD
Undergraduate degree in same content area as Advanced Placement course taught	4.200	.905	4.123	1.005
Graduate degree of any kind	3.200	.034	2.709	1.211
Graduate degree in same content area as Advanced Placement course taught	3.415	1.117	3.012	.309

Scale: 1=*not important*, 2=*somewhat important*, 3=*important*, 4=*very important*, 5=*extremely important*

Administrators and teachers were asked to rate the importance of science teaching experience and Advanced Placement experience in providing quality Advanced Placement science classes using the same Likert scale. The results are listed in Table 9.

Table 9
Importance of Teaching Experience
According to Teachers and Administrators

Overall Teaching Experience

	Mean	SD
Administrators	4.585	.610
Teachers	4.284	.840
Advanced Placement Teaching Experience		
Administrators	3.815	.788
Teachers	3.753	.888

Scale: 1=*not important*, 2=*somewhat important*, 3=*important*, 4=*very important*, 5=*extremely important*

Table 10 lists information regarding administrator and teacher perceptions of the importance of a lighter teaching load for Advanced Placement science teachers. Table 11 contains the results of a Mann Whitney U—Wilcoxon Rank Sum W Test comparing the responses of the two groups. A significant difference exists between the administrator and teacher ratings of the importance of a lighter teaching load at the chosen alpha level. Teachers placed more importance on lightening the teaching load of Advanced Placement science teachers than did administrators.

Table 10
Importance of Lighter Teaching Load
According to Administrators and Teachers

	Mean	SD
Administrators	2.508	1.276
Teachers	3.494	1.108

Scale: 1=*not important*, 2=*somewhat important*, 3=*important*, 4=*very important*, 5=*extremely important*

Table 11
Mann Whitney U—Wilcoxon Rank Sum W Test:
Comparison of Administrator and Teacher Responses
for Importance of Lighter Teaching Load

U	W	X	2-TAILED P
1498.0	3643.0	- 45992	.0000*

*P<.004

EXAMINATION RESULTS

The percentage of Advanced Placement science students at Catholic schools that take the Advanced Placement examination for each of the courses is given in Table 12. Chemistry students made up the largest portion (57%) of students who take the exam. Biology (44.7%) and physics (42.3%) students comprise slightly smaller percentages of students who sit for an exam.

Table 12
Percentage of Advanced Placement Science Students
Taking Examination

Course	Percentage
Biology	44.7
Chemistry	57.0
Physics	42.3

Table 13 lists the percentage of students taking the exam that scored a qualifying score of three or better. Chemistry had the greatest percentage (75.3%) of students achieving a qualifying score. Biology (64.6%) and physics (61.1%) also had well over half the students score three or better.

Table 13
Percentage of Students Scoring Three or Higher
on Advanced Placement Examinations

Course	Percentage Scoring Three or Higher
Biology	64.6
Chemistry	75.3
Physics	61.1

Table 14 shows how administrators and teachers rated the importance of both the number of students taking an exam and the number receiving a qualifying score in evaluating teacher performance. The results of a Mann Whitney U—Wilcoxon Rank Sum W Test are displayed in Table 15. No significant difference existed in either category between administrator and teacher responses at the chosen alpha level. Both administrators and teachers indicated that the number of students taking the exam and the number of students scoring three or better were *somewhat important* to *important* in evaluating the performance of an Advanced Placement science teacher.

Table 14
Importance of Examination Results in Evaluating Teacher Performance
According to Administrators and Teachers

Result	Administrators		Teachers	
	Mean	SD	Mean	SD
Number of students taking an Advanced Placement Examination	2.385	1.114	2.457	1.215
Number of students receiving a qualifying score on an Advanced Placement Examination	3.046	.856	2.778	.935

Scale: 1=*not important*, 2=*somewhat important*, 3=*important*, 4=*very important*, 5=*extremely important*

Table 15
Mann Whitney U—Wilcoxon Rank Sum W Test: Comparison of
Administrator and Teacher Responses for Importance of Examination
Results in Evaluating Teacher Performance

Number Taking Exam				
U	W	X	2-TAILED P	
2579.5	4724.5	- .2154	.8295	
Number Qualifying				
U	W	X	2-TAILED P	
2227.0	5183.0	- 1.6873	.0915	

*P<.004

SUMMARY OF FINDINGS

The findings of this study are organized according to the three major areas of interest: curriculum, instruction, and examination results.

CURRICULUM

The demand for Advanced Placement science courses has been on the rise for several years. According to the survey results, both teachers and administrators felt that their school was adequately meeting the student demand for Advanced Placement science courses.

Although the College Board does not require instructors of the three Advanced Placement science courses to follow a standard course outline or use a required text, it does provide materials and services designed to support instructors in the planning and teaching of the courses. Teachers indicated that materials such as curriculum guides, lists of recommended textbooks,

and lab guides were all important sources of information. They also indicated that past exams were the most important source of information used to make curriculum decisions.

INSTRUCTION

Teachers of Advanced Placement science courses are likely to have an advanced degree. Both teachers and administrators agree that formal education at both the graduate and undergraduate levels is an important factor influencing instruction. Teaching experience and Advanced Placement teaching experience are also important characteristics of effective Advanced Placement science instructors. Both teachers and administrators agreed that experience was a very important factor influencing instruction.

Teachers and administrators disagree on the importance of a lighter teaching load for Advanced Placement science teachers. Teachers indicated that a lighter teaching load was *important to very important* while administrators indicated it was only *somewhat important*. This difference implies that teachers and administrators do not agree on the value of increased planning time for those teaching Advanced Placement science.

EXAMINATION RESULTS

Nearly one-half the students enrolled in Advanced Placement science courses took the Advanced Placement examination. Of those taking the exam, approximately two-thirds received a qualifying score of three or better. Chemistry had the highest percentage taking the exam (57%) and the highest percentage scoring three or better (75%). Both teachers and administrators agreed that examination results were a *somewhat important to important* factor in evaluating teacher performance.

RECOMMENDED GUIDELINES FOR IMPLEMENTING ADVANCED PLACEMENT SCIENCE COURSES AT CATHOLIC HIGH SCHOOLS

The following guidelines for the development and implementation of Advanced Placement science courses at Catholic high schools are based upon the literature review and questionnaire results. The recommendations are divided into three categories: curriculum, instruction, and examination results.

CURRICULUM

1. Catholic schools considering adopting an Advanced Placement science program should survey parents and students to determine the demand for such courses.
2. The administration and members of the science department should examine the budget to determine whether funds are available for the establishment of college-level, lab-oriented science courses. Budgetary constraints unique to Catholic high schools might influence the decision to establish the program.
3. A committee of science instructors, administrators, and outside experts in the field of science education should be formed to coordinate the implementation of the program. This committee would specifically address issues regarding curriculum, such as course outlines, textbook selection, and course prerequisites.
4. Scheduling procedures should take into consideration the need for laboratory time. If possible, a separate lab section should be established for each course.
5. A coordinator of Advanced Placement programs at the school should be appointed to oversee the administrative aspects of the program.

INSTRUCTION

6. Selection of faculty for an Advanced Placement science program should be the top priority for an administrator seeking to establish a successful program. The process should involve science instructors and outside experts in the field of science instruction.
7. Specific teacher qualities that should be emphasized in the selection process include: (1) experience teaching high school science, (2) experience teaching Advanced Placement science, (3) an undergraduate degree in the same content area as the course being established, and (4) a graduate degree.
8. Once an instructor is hired for the program, he or she should be provided with opportunities for professional development. These should include workshops and courses sponsored by the College Board.
9. Every effort should be made to provide the Advanced Placement instructor with additional planning time. If a reduction in teaching load is not possible, the administrator should communicate clearly the reasons to the teacher and then, along with the teacher, decide whether the school is adequately prepared to implement an Advanced Placement science program.

EXAMINATION RESULTS

10. A clear policy regarding the Advanced Placement examination should be established before implementation of the program. Both the administration and the instructors should decide whether the examination is to be a required part of the course. If the examination is to be a required part of the course, additional policy regarding cost must also be established.
11. The role of examination results in the evaluation of the teacher and the course should be made clear to everyone involved. If examination results are to be used to evaluate instruction, it is imperative that the teacher and administrator agree that such a system is valid and acceptable to both parties.

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APPENDIX

SURVEY OF ADVANCED PLACEMENT SCIENCE INSTRUCTORS

This questionnaire is designed to gather information concerning Advanced Placement science programs in Catholic high schools. Your responses will help in the development of programs at other Catholic high schools.

SECTION 1: AP SCIENCE CURRICULUM

During the 1994-1995 school year, I taught the following Advanced Placement courses:

- Biology Chemistry Physics B Physics C

Which of the following best describes the student demand for the Advanced Placement science course(s) that you teach:

- Little if any demand Some demand
 Moderate demand Heavy demand

The following items pertain to the **relative importance of certain sources of curriculum materials in the planning and teaching of your Advanced Placement science course(s)**. Please place an X in the box that corresponds to the appropriate response. Mark only one box for each item.

Key: NI=Not Important SI=Somewhat Important I=Important
 VI=Very Important EI=Extremely Important

	NI	SI	I	VI	EI
1. The course outlines provided in the Advanced Placement Course Description booklets.					
2. The teacher's guide provided by the College Board for each Advanced Placement course.					
3. The list of appropriate textbooks provided by the College Board.					
4. Copies of past Advanced Placement examinations.					
5. Advanced Placement teleconferences sponsored by the College Board.					
6. Advanced Placement workshops sponsored by the College Board.					
7. Recommended laboratory topics provided by the College Board.					

Which of the following outside sources of course materials have you used for your Advanced Placement science course? You may mark more than one.

- Local college Colleagues at other Catholic schools
 Local business or industry Colleagues at public schools
 Other. Please explain: _____

SECTION 2: AP SCIENCE LAB AND FACILITIES

The following items pertain to the **laboratory component** of your **Advanced Placement science course(s)**. Please place an "X" in the box that corresponds to the appropriate response. Mark only one box for each statement.

Key: SD=Strongly Disagree D=Disagree DK=Don't Know
 A=Agree SA=Strongly Agree

	SD	D	DK	A	SA
1. The lab experience of my Advanced Placement students closely mirrors that of a typical first-year college course.					
2. The lab experience of my Advanced Placement students prepares them for the demands of lab work in advanced-level college science courses.					
3. The physical facilities at my school are adequate for the type of work required in an Advanced Placement science course.					
4. The science department budget adequately provides for the expense of operating an Advanced Placement science lab.					
5. The breadth and depth of content in an Advanced Placement science course make it necessary to limit lab time.					
6. As a Catholic high school, our science facilities compare adequately with public schools of similar size.					

The average number of hours spent in the lab each week by my Advanced Placement science students is:

- Less than 1
 1-2
 3-4
 More than 4

SECTION 3: AP SCIENCE INSTRUCTION

Which describes the highest academic degree you have received:

- Bachelor's
 Master's
 Specialist degree
 Doctorate

Please indicate if your undergraduate degree is in the same content area as the Advanced Placement science course(s) you teach: Yes No

Please indicate whether the highest academic degree you have received is in the same content area that you teach: Yes No

Which, if any, of the following professional development activities have you participated in within the last three years (you may mark more than one):

- AP workshop sponsored by the College Board
 Other workshops
 AP teleconference
 AP summer institute
 Other summer institutes sponsored by the College Board
 I have not participated in a professional development activity in the last three years.

Other. Please be specific: _____

Please indicate the years of experience you have teaching high school:

Less than 3 3-5 6-10 11-15 16-20 More than 20

Please indicate the years of experience you have teaching Advanced Placement science courses:

Less than 3 3-5 6-10 11-15 16-20 More than 20

The following items pertain to the **relative importance of each teacher characteristic in positively influencing instruction**. Please place an X in the box that corresponds to the appropriate response. Mark only one box for each item.

Key: NI=Not Important SI=Somewhat Important I=Important
 VI=Very Important EI=Extremely Important

	NI	SI	I	VI	EI
1. Undergraduate degree in same content area as the Advanced Placement course he/she teaches					
2. Advanced degree of any kind or level					
3. Advanced degree in same content area as the Advanced Placement course he or she teaches					
4. Some experience teaching high school					
5. Some experience teaching Advanced Placement science courses					
6. Participation in AP workshops					
7. Participation in other professional workshops					
8. Lighter teaching load than colleagues who do not have Advanced Placement courses					

SECTION 4: AP EXAMINATION

The following items pertain to **Advanced Placement examinations administered by the College Board**. Please place an X in the box that corresponds to the appropriate response. Mark only one box for each statement.

Key: SD=Strongly Disagree D=Disagree DK=Don't Know
A=Agree SA=Strongly Agree

	SD	D	DK	A	SA
1. All students enrolled in an Advanced Placement science course should be required to take the AP exam.					
2. Advanced Placement science course offers benefits for students who do not take the AP examination.					
3. The AP examination results are a valid measure of my competency as an instructor.					
4. My administrator uses AP examination results as a tool for evaluating me as an instructor.					
5. The level of difficulty of the AP examination is appropriate for a first-year college course.					

Please indicate, to the best of your knowledge, the total number of students enrolled at the end of the 1994-1995 school year in the Advanced Placement science course(s) that you taught: _____.

Please indicate, to the best of your knowledge, the total number of students that took the Advanced Placement examination in May of 1995 in your science area: _____.

Please indicate, to the best of your knowledge, the total number of students in your Advanced Placement science course(s) that scored a 3 or better on the AP examination in May of 1995: _____.

SECTION 5: DEMOGRAPHIC INFORMATION

Please indicate the type of school: Coed All Boys All Girls

Please indicate the setting of your school: Urban Suburban Rural

Please indicate the student population of your school:

- 250 or less 251-500 501-750
 751-1000 1001 or more

Full Name of School: _____

SURVEY OF ADMINISTRATORS AT SCHOOLS WITH ADVANCED PLACEMENT SCIENCE PROGRAMS

This questionnaire is designed to gather information concerning Advanced Placement science programs in Catholic high schools. Your responses will help in the development of programs at other Catholic high schools.

Full Name of School: _____

SECTION 1: AP SCIENCE CURRICULUM

During the 1994-1995 school year, we offered Advanced Placement courses in the following science areas:

- Biology Chemistry Physics

The Advanced Placement science course(s) at our school are offered:

- Every Year Every Other Year

Other. Please explain: _____

The following items pertain to the **curriculum and facilities of the Advanced Placement science courses in your school's science department**. Please place an X in the box that corresponds to the appropriate response. Mark only one box for each item.

Key: SD=Strongly Disagree D=Disagree DK=Don't Know
 A=Agree SA=Strongly Agree

	SD	D	DK	A	SA
1. The availability of Advanced Placement science courses at our school adequately meets the student demand.					
2. The physical facilities in the science department at our school are adequate for the type of work required in an Advanced Placement science course.					
3. The science department budget adequately provides for the expense of operating an Advanced Placement science lab.					
4. All students enrolled in an Advanced Placement science course should be required to take the AP examination.					

	SD	D	DK	A	SA
5. As a Catholic school, our science facilities compare adequately with public schools of similar size.					
6. Advanced Placement science courses offer benefits for students who do not take the AP examination.					
7. The Advanced Placement science instructors at our school use the curriculum materials provided by the College Board to plan and teach their courses.					

SECTION 2: AP SCIENCE INSTRUCTION

The following items pertain to the **relative importance of each teacher characteristic when selecting an Advanced Placement science instructor**. Please place an X in the box that corresponds to the appropriate response. Mark only one box for each statement.

Key: NI=Not Important SI=Somewhat Important I=Important
 VI=Very Important EI=Extremely Important

	NI	SI	I	VI	EI
1. Undergraduate degree in same content area as the Advanced Placement course he/she will be teaching					
2. Advanced degree of any kind					
3. Advanced degree in same content area as the Advanced Placement course he/she will be teaching					
4. Some experience teaching high school science					
5. Some experience teaching Advanced Placement science courses					
6. High degree of interest in the subject matter					

The following items pertain to the **relative importance of each factor when evaluating teacher performance in an Advanced Placement science course**. Please place an X in the box that corresponds to the appropriate response. Mark only one box for each statement.

Key: NI=Not Important SI=Somewhat Important I=Important
 VI=Very Important EI=Extremely Important

	NI	SI	I	VI	EI
1. The number of students taking an Advanced Placement examination					
2. The number of students receiving a qualifying grade on an Advanced Placement examination					
3. Participation in Advanced Placement workshops sponsored by the College Board					
4. Professional development activities such as formal coursework, workshops, summer institutions					

SECTION 3: DEMOGRAPHIC INFORMATION

Please indicate the type of school: Coed All Boys All Girls

Please indicate the setting of your school: Urban Suburban Rural

Please indicate the student population of your school:

- 250 or less 251-500 501-750
 751-1000 1001 or more

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