Junior High and Middle School Programs

Curriculum Goals and Activities
Resources for Teachers
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November 1994
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EDITORS COMMENTS

Working on a New Look

By Ed Osborne

The Agricultural Education Magazine is in search of new ideas to refresh its appearance. This month, the magazine has introduced a new look that is more modern and colorful. The new design features a four-color, slick cover that is eye-catching and inviting. The cover design is not only visually appealing but also functional, as it is made of a durable material that is easy to clean and maintain.

The new look has been well-received by the readers, who have praised the magazine for its fresh and innovative approach. The magazine has also received positive feedback on its new layout and design, which is more user-friendly and engaging.

The changes made to the magazine are not just cosmetic; they are also aimed at improving the quality of the content. The magazine has added more features and columns that are relevant to the readers, such as classroom ideas, teaching strategies, and school news.

In conclusion, the new look of The Agricultural Education Magazine is a step in the right direction. The magazine has successfully rejuvenated itself, making it more appealing and relevant to its readers. With its new design and content, the magazine is poised to continue delivering valuable information to its readers for many years to come.
Why Middle School/Junior High Programs?

While high school and adult agricultural education programs have been around for a long time, even pre-dating the 1917 Smith-Hughes Act, middle/junior high school programs are relatively new to our profession. In recent years, the middle/junior high school program has become a popular one and represents the fastest growing area of agricultural education.

For example, Rossetti and McGuslin report that 30 states have over 50,000 middle/junior high school students enrolled in agricultural education programs. With such a large enrollment, agricultural educators have a wonderful opportunity to influence and begin the process of preparing more students than we ever have before for the field of agriculture. Such students will have the opportunity to have SAE experiences (both entrepreneurial and experiential) and to be members of the FFA. The complete program of agricultural education will be available to them.

It is important to keep in mind that the middle/junior high school program is not simply a smaller version of the high school program. It is equally true that middle/junior high school students are not simply smaller versions of high school students. Lafl and Armenta give helpful suggestions on how to teach and work best with students in middle/junior high school. Each student brings several attributes to our programs. They have a naturally curious, a lot of energy, are generally still excited about school, and interested in learning what is presented to them. On the other hand, agricultural educators must always strive to continue the development of self-concept in students, who have just barely developed confidence in themselves.

Obviously, the middle/junior high school student must be taught something. That something comes from the curriculum which has been developed and is being developed for this level of the program. As a relatively new curriculum, we have much that can be done. We have few pre-conceived notions about what should be taught. With a clean slate to start with, we have the opportunity to integrate more science concepts into the middle/junior high school curriculum and to make it very contemporary. Rudd reminds us that teachers must believe the curriculum to be beneficial, must be knowledgeable of the curriculum, and must have a positive attitude about it in order for the curriculum to be adopted successfully. The results of his study have significant implications not only for teachers, but also for teacher educators and state supervisors. It behooves all agricultural educators to learn more about the middle/junior high school curriculum.

Once the curriculum has been adopted, it should be taught to accomplish its purpose.

"In recent years, the middle/junior high school program has become a popular one and represents the fastest growing area of agricultural education."

Keeping the age and maturity level of the student in mind is always important. Middle/junior high school students need to have interest approaches and teaching methods that are appropriate for them. This age level of student is neither an elementary student, nor a high school student. They are something in between and have their own unique characteristics.

Miller tells us that both teaching methods and instructional materials used with such students need to be carefully thought out, examined, and used appropriately. There are numerous instructional materials available, and many are being developed every day.

The FFA is an integral part of agricultural education and has been since 1928. This fact is equally true for senior high school programs and for middle/junior high school programs. Weaver and Capp remind us that middle/junior high school FFA members should have an opportunity to participate in contests and other activities that are intended for them. Simply modifying senior level contests and activities does not always create the right situation. Middle/junior high school contests need to be curriculum driven and appropriate for early adolescents. Success for all is more important than winning for a few. The new middle/junior high school contests have provided an excellent opportunity to emphasize applied science.

The future for middle/junior high school programs looks very bright. We have the opportunity to add a most important element to the curriculum to be adopted successfully. (continued on page 9)

Developing Self-Concept Through Middle Level Agricultural Education

Agricultural education programs are expanding to the middle or junior high school levels. With that expansion should come an understanding on the part of agriculture teachers of the child and current educational trends at the middle level. How many agriculture teachers are in tune with the physical and emotional needs of the middle level child, programs of the middle or junior high school, and current educational trends at that level?

Middle level children are going through drastic changes in terms of physical and intellectual development, which causes them to experience dramatic changes in self-concept at a younger age. In fact, it has been suggested that the development of a positive self-concept may be the most important need for early adolescents (Van Hoose and Shazlan, 1988). Agriculture teachers need to pay particular attention to helping build self-concept among their students at the middle level. The design of agricultural education programs provides an excellent means of building self-concept.

Middle School Structure

One of the most influential reports of the 1980s, Turning Points: Preparing American Youth for the 21st Century, gained national attention with its recommendations for middle level schools (Allen, Spligerer, & Manning; 1993). The report made a powerful impact because it not only addressed the school needs of young adolescents, but it evoked concern for their total lives—their health, welfare, self-esteem, and sense of purpose.

Agricultural education programs can contribute to each of these concerns. Let's look at some of the recommendations of Turning Points, (1993), as outlined by Allen, et al. (1993), and discuss how agricultural education can contribute to accomplishing them.

Create small communities for learning. The organization of patterns to accomplish this are schools-within-schools, interdisciplinary team organization, and small group advising teams that ensure that each student is known well by at least one adult. Schools structured using the Turning Points recommendations, agricultural education can be part of an interdisciplinary team and assure that students enrolled in agriculture are assigned together on a team. Teams consist of four or five core teachers (i.e., mathematicians, science, language arts, social studies, and agriculture) working with about 100 students. Units in academic subjects could center around themes relating to agriculture and be of interest to agriculture students. Advising groups consist of about 25 students assigned to a teacher. The middle or junior high school FFA members could be the agriculture teacher's advising group. Using interdisciplinary instruction and serving as an advisor to a group of students can be accomplished in traditional middle level structures as well.

Teach a core academic program. This involves emphasizing studies resulting in students who are literate, can think critically, lead healthy lives, behave ethically, and assume roles and responsibilities of citizenship. Agricultural education and FFA promote each of these attributes through various classroom, laboratory, or community activities. Instruction about agriculture helps students to become agriculturally literate. Learning activities which require problem solving and critical thinking can easily be worked into agriculture instruction. The FFA can certainly promote ethical behavior and citizenship.

Ensure success for all students. The middle level school should be a success-oriented school by eliminating tracking based on achievement testing, by establishing cooperative learning, and by stressing flexibility in instruction, organization, and schedules.

"Agriculture teachers need to pay particular attention to helping build self-concept among their students at the middle level. The design of agricultural education programs provides an excellent means of building self-concept."

Agricultural education can contribute to the success of students by addressing the needs of all students through individualized projects and activities, using small group and cooperative learning techniques, engaging students in a variety of activities to address the varied learning styles of students, and providing learning activities that ensure success. Success builds confidence and self-esteem!
What's in the Bag of Tricks?

by Darla L. Miller
Ms. Miller is a graduate student in agricultural education at Virginia Tech, Blacksburg, VA.

It is imperative for middle school agriculture educators, by the very nature of the students they teach, to have access to an extensive and diverse “bag of tricks” from which to pull teaching and curriculum materials. As teachers scan through the varied sources of instructional materials cataloged available in the field, they must ask themselves, “Will this be appropriate for the age level of the students I am teaching?” Those of us with middle school experience know that sometimes deciding what to teach is often just as hard as finding the appropriate materials with which to teach.

In the past five years, the middle school agriscience program has slowly caught the attention of many publishing companies, and as a result, new materials appropriate for the middle school level are becoming available.

Before discussing available materials on the market, it is important to take time to highlight some important characteristics and requirements of quality middle school curriculum materials. A Program Planning Guide for Agriscience and Technology Education (1994) proposes the following criteria to be adhered to when selecting materials: (a) possesses technically accurate content; (b) shows and uses current technology; (c) is validly supported by site testing; (d) is prepared by credible writers in or associated with the profession; (e) uses appropriate instructional methods; and, (f) provides supporting materials for activities or references. Additionally, the curriculum materials should be well-organized and readable for the appropriate grade level. And most importantly, the materials should promote the practical application of content by providing integration of subjects with various hands-on activities.

Probably the most well-known middle school curriculum materials presently available on a commercial basis are Exploring Agriculture in America, developed by the Instructional Materials Inventory, and Farm and Food Bytes, a computer-enhanced series produced by Agri-Education, Inc. Exploring Agriculture in America is the general curriculum that provides a varied content of agriculture for students in seventh and eighth grades. Unit titles include: Agriculture in America, Agriscience in Society, Plants in the Environment, Products from Agriculture, Environment and Resource Conservation, and Pet Care, Law, and Equipment, and Home Environmental Management. The layout for the lessons is easy to follow, being designed around a question and answer format. Each lesson comes complete with reproducible sheets for transparency and activities to enhance the lesson. In addition, evaluation materials are provided in the completion of each unit. A student reference book is provided to supplement instruction.

Though the Farm and Food Bytes series is more appropriately designed for elementary level students (4th, 5th, and 6th grades), there are uses for middle school students. Its integration with language arts, science, math, and social studies assists with illustrating the importance of agriculture in everyone’s life. Besides being computer-driven, a student manual and teacher’s guide provides additional learning opportunities. The series includes the following topics available in both Apple and IBM-compatible software: Introduction to Agriculture, Soil and Water Conservation, and Animal Agriculture.

In the past year several appropriate textbooks have become available to use for instruction or as references in the classroom. An excellent general agriculture textbook in Agriscience in Our Lives, for integration of science concepts, Introduction to World Agriscience and Technology provides an excellent, science-based approach to agriculture. The text is supplemented with a workbook designed to incorporate practical and application of the classroom curriculum. Several other textbooks, even though geared more for the high school student, also provide excellent reference materials for the middle school teacher. They are Agriscience Fundamentals and Applications, Agriscience Technology, Managing Our Natural Resources, and Agricultural Mechanics: Fundamentals and Applications. A recently published text titled Biological Sciences Applications in Agriculture provides an excellent section on conducting experiments and summarizing and reporting skills. The bulk of the book provides procedures for hands-on experiments related to biological applications. Hopefully, middle school teachers have already found these treasures and are using them in the classroom.

To discuss all of the supplemental material available, such as audiodisc, experimental kits, games, software, and so forth would be an endless task. However, all reliable are distributors such as Carolina Biological and Boron Science Kit for integrative-type materials.
Virginia is currently in the final stages of completing instructional units for its middle school agriscience curriculum. Formed around Agriscience Education for the Middle School, the competency-based instructional guide provides teaching lessons for the sixth, seventh, and eighth grade agriscience program. Table 1 highlights the unit topics included in Virginia’s program.

### Table 1
**Recommended Topics of Instruction for Virginia’s Middle School Agriscience Program**

#### INTRODUCTION TO AGRISCIENCE (8002)
- **GRADE 6 (18 weeks or less)**

#### DUTY AREAS
- **Duty Area 0**: Becoming Oriented to Agriscience
- **Duty Area 1**: Describing Agriculture
- **Duty Area 2**: Introducing Plant and Animal Life Cycles
- **Duty Area 3**: Communicating with Others
- **Duty Area 4**: Introducing Agricultural Mechanics/Technology
- **Duty Area 5**: Introducing Ecology and Conservation
- **Duty Area 6**: Identifying Career Opportunities in Agriculture

#### AGRISCIENCE EXPLORATION (8003)
- **GRADE 7 (18 weeks)**

#### DUTY AREAS
- **Duty Area 0**: Becoming Oriented to Agriscience
- **Duty Area 1**: Understanding Importance of Agriculture/Agriscience
- **Duty Area 2**: Conceiving Natural Resources
- **Duty Area 3**: Exploring Research in Agriculture
- **Duty Area 4**: Introducing Animal Science
- **Duty Area 5**: Introducing Basic Laboratory Skills
- **Duty Area 6**: Increasing Personal Development

#### AGRISCIENCE AND TECHNOLOGY (8004)
- **GRADE 8 (18 or 36 weeks)**

#### DUTY AREAS
- **Duty Area 0**: Becoming Oriented to Agriscience
- **Duty Area 1**: Understanding New Technologies in Agriculture/Agriscience
- **Duty Area 2**: Understanding International Agriculture
- **Duty Area 3**: Understanding Agricultural Business
- **Duty Area 4**: Using Microcomputers in Agriculture
- **Duty Area 5**: Introducing Supervised Agricultural Experiences
- **Duty Area 6**: Using Hand Tools and Agricultural Power Equipment
- **Duty Area 7**: Developing Leadership Skills
- **Duty Area 8**: Experimenting in Agriculture

Each lesson has been field-tested in a middle school setting by members of the curriculum’s advisory council. The units lack a student guide, but they do provide an extensive list of reference materials, some of which have already been identified previously in this article. In the development of these materials, the writers found the following sources to be the most beneficial in presenting information on a level understandable to the middle school learner: Food For America, Ag in the Classroom, Farm Facts by the American Farm Bureau, Virginia 4-H Food and Fiber Systems curriculum, the FFA Student Handbook, the 50 Things You Can Do to Save the Earth series, The Amazing Paper Book, The Amazing Dirt Book, The Amazing Apple Book, The Amazing Egg Book and The Amazing Milk Book series.

Various published and unpublished materials emphasize how American agriculture fits into the global picture. A publication distributed from the Ohio Agricultural Curriculum Materials Service titled Activities to Enhance Student Understanding of International Agriculture provides some exciting instructional devices in helping students comprehend the importance of agriculture across the world. The Supervised Agricultural Experience (SAE) program is an integral part of the agriscience curriculum. Two innovative middle school teachers have created a “spin-off” from Virginia’s SAE record book to help middle school students conduct a science-oriented SAE program. The books are designed to provide students the opportunity to learn record-keeping skills by tracking the progress and expenditures of their agriscience project or activity.

There is an abundant amount of material available for middle school teachers to use. Knowing where to look to fill your “bag of tricks” is the key. Hopefully, the information provided here will make it easier to gather needed materials for classroom use. However, remember, the best materials are those that yield success for the teacher and the students. As a result, many teachers have developed their own curriculum materials, but without the available resources, they have not been able to distribute them on a wide basis.

In the near future, look for new middle school curriculum materials from Intermediate Publishers, Inc., and the National Council for Agricultural Education. And get ready to fill your “bag of tricks.” Middle school agriscience has caught the attention of many.

### Why Middle School...
(continued from page 4)

The ones we are presently serving. Considering the total number of students in schools at this level and how many are currently enrolled in the agricultural education program, there is tremendous potential. Our profession will have a very strong program for years to come. At the rate the middle/junior high school program is being developed and with its graduates soon attaining high school, it is very possible that such students will expect similar, contemporary-based curricula and FFA activities. It is very possible that middle/junior high school agriculture programs will be exerting influence on senior high school programs in the near future through their matriculating students. Middle/junior high school students are here, and they are here to stay.

### Developing Self-Concept...
(continued from page 3)
The middle level of education should concentrate heavily on developing students’ self-concept. Agricultural education programs can contribute tremendously in fulfilling this need.

#### References

#### Coming In December...
### Environmental Education Programs

### Reference
Agriscience Contests Benefit Middle School FFA Members

What is the lifetime of high school FFA chapters? With the increase in middle school FFA chapters around the nation, the answer to this question is the middle school FFA member. But what are state and national FFA organizations doing to meet the needs of the middle school FFA member? By providing state and national middle school FFA contests, Virginia is leading the way to increased membership, membership enthusiasm, and increased involvement.

The development of middle school agriscience contests in Virginia in the early 1990s placed more emphasis on agricultural science, diversity, and literacy. The junior-level FFA competitions were no longer in line with the new instruction being implemented in the middle schools. Therefore, these high school FFA contests were no longer meeting the needs of middle school FFA members. A group of middle school FFA advisors designed contests which were curriculum driven to meet the needs of these specific students. By studying the newly developed state curriculums, five basic topics were found to be commonly taught in middle school agriscience schools. These areas included: FFA, mechanics and technology, plant science, animal science, and agricultural products.

The five contests developed from the curriculum were: Agriscience Technology Mechanics Contest, Companion/Small Animal Contest, FFA Quiz Bowl, Food and Fiber Contest, and the Plant, Seed and Fruit Identification Contest. The sixth event is an Agriscience Fair.

For each contest, general rules include that teams consist of a maximum of four members. The best three individual scores are totaled to determine the team score. All four members are eligible for individual awards. A middle school awards ceremony is held during the state FFA convention. First, second, and third place teams are recognized, with plaques and trophies given to the first place team. Agriscience Fair winners also receive a plaque for the chapter and a trophy for the individual. Ribbons are awarded to all participants. Individual scores are ranked according to a blue, red, and white rating so that every member comes away a winner!

The Agriscience Technology Mechanics Contest, a team event, is comprised of five different components. This contest challenges students to explain and demonstrate safety practices, read and interpret directions, identify and use basic woodworking hand tools, select and use measuring devices, and perform measuring skills.

The five components of the test are: written test, tool identification, measuring skills, woodworking skills, and evaluation of a project. The written test is composed of 25 multiple choice questions covering items from general safety to use of hand and portable power equipment. Students are required to identify 25 tools from a list of 57 tools commonly used in a middle school agriscience department. Students also have to perform 10 different measuring skills. Examples include calculating board feet and measuring length, width, and thickness of various pieces of lumber using a variety of measuring devices. To complete the woodworking skill members are given a simple plan and necessary equipment. Students must demonstrate safety skills and proper usage of tools while performing the skills. In the evaluation section, students are given a plan and four different projects that they must evaluate according to said plan. They must take into consideration correct angles, sanding, finishing, and general appearance of the projects given.

This contest is a challenge and uses skills and information taught at the middle school level. Members enjoy the challenge and type of competition that it allows. Resources used for this contest include Agriscience Technology: Fundamentals and Applications by Cooper and Modern Agricultural Mechanics by Burke and Wakeman.

The Companion/Small Animal Contest demonstrates contestants' knowledge about a specific scientific term used in the animal industry, new technologies in animal science, ethical concerns related to animal welfare, and career opportunities in animal science. Companion animals, small animals include dogs, cats, fish, game birds, rabbits, and small mammals, such as hamsters and guinea pigs.

The contest consists of two sections: identification of representative samples from three categories—feeds, breeds, and equipment—and a written test consisting of 25 questions concerning care, nutrition, animal welfare, new technologies, careers, and terminology. Resources used in the contest are Agriscience Fundamentals and Applications, Units 12 and 29, and the video "Responsible Pet Ownership," which is secured through Modern Talking Pictures.

The FFA Quiz Bowl Contest is a team event designed to develop an understanding of the FFA. This contest helps students develop oral communication skills, identify effective leadership traits, develop social skills, and identify opportunities for leadership development through participation in FFA activities. Participants need to know all aspects of the FFA. Questions are asked about history, current events, important names, facts about the FFA, FFA officers, symbols, the emblem, membership, medal, and awards. Students also need to be knowledgeable about parliamentary procedure, use of the FFA jacket, conventions, conferences, and items from the New Horizons magazine.

The Quiz Bowl Contest consists of two parts: a written test and oral competition. The written test is made up of 50 multiple-choice and true/false questions. The oral competition consists of a round of 25 factual questions. Three to four members per team operate in a head-to-head competition using buzzers in the oral quiz bowl. Team members are not allowed to confer with each other when answering. Correct answers are worth 10 points, while incorrect answers are penalized 5 points. Students may study for the event by reading...
Putting Theory into Practice: Adopting Middle School Agriscience Curricula

All teachers quickly learn, time is a valuable commodity. We need time to prepare for class, time to evaluate students, time to teach, and time to update our selves in our chosen field of expertise. With all of these demands on our time, we are reluctant to add items to our personal agenda. This is often the case with adopting new curricula for use in our classrooms.

We can all remember our first year of teaching. Many of us do not know exactly how we made it through the intense schedule of learning how the school district operates and balancing classroom teaching with FFA and other activities, as well as having a personal life.

A major part of beginning a teacher's time is spent developing lessons and designing adopting a curriculum for the program. Once this task is completed, many teachers will rely on this work for a substantial part of their career. How many teachers do you know who will still use the lesson plans they developed while student teaching? The problem with this method of curriculum development is that the curriculum quickly becomes outdated.

State of the Middle School Curriculum

In 1988, the National Research Council reported that curricula in agricultural education have not kept up with the agricultural industry. This problem is of particular interest to middle school agricultural educators. Although middle school programs have been in existence since 1925 (Hillison, 1993), only recently have middle school programs shown substantial growth on a national scale.

The appropriate curriculum for middle school agricultural education is still under construction (Hansen & Miller, 1988). In many cases the lack of a middle school curriculum has led to the adjustment of high school curricula to the middle school level.

Adopting New Curricula

Given the lack of sufficient curriculum in middle school agricultural education, it is likely that many programs are using a curriculum that does not meet the needs of the students. Fortunately, curriculum development efforts are underway. Unfortunately, many of these efforts are uncoordinated or even non-existent.

Virginia middle school agriculture teachers were presented with a new curriculum for their programs in 1990. Work with those teachers has revealed several characteristics that influence a teacher's decision to spend the time and effort necessary to adopt a new curriculum.

As stated earlier, time is a valuable asset for teachers. In order for us to adopt a new task to our schedules, we must be certain of its merits. A set of circumstances that are conducive to transformation must exist if teachers are to change from their current curriculum to a new curriculum. Three teacher characteristics stand out as being pivotal to the decision to adopt a new curriculum. They are (1) teachers' knowledge of the curriculum, (2) teachers' expectations of the curriculum, and (3) teachers' attitudes toward the curriculum (Rudd, 1994).

The agricultural industry is a vast, relatively untapped resource that can provide agricultural education with support for curriculum development. For example, the Virginia Agricultural Council supported middle school agriscience curriculum development efforts with a $24,000 two-year project. The program provided

The appropriate curriculum for middle school agricultural education is still under construction (Hansen & Miller, 1988). In many cases the lack of a middle school curriculum has led to the adjustment of high school curricula to the middle school level.

### Knowledge

Teachers must know the curriculum content before they can teach it. House (1981) suggested that teachers tend to teach what they know best. Teacher knowledge of curriculum is a strong predictor of curriculum adoption. Too often curricular innovations are presented to teachers in the field with little or no preparation for implementation. Professionals in agricultural education and the industry of agriculture need to be concerned with the state of curriculum innovations. If teachers are expected to adopt a curriculum that contains material they were not prepared to teach with no additional training, the curriculum innovations will surely fail. If the field of agriculture desires new professionals that will contribute to the food and fiber industry, it must be willing to support agricultural education in the implementation of curricular innovations.

### Expectations

Teachers are more likely to adopt a new curriculum if they perceive it to be more beneficial to the students they are currently in place. Teachers tend to be concerned about the effects of educational change on their students (Darr, 1985).

If middle school agriculture teachers are expected to adopt a new curriculum that meets the needs of their students, they must be shown the benefits of that new curriculum above and beyond the benefits of the existing curriculum. A selling point for the Virginia middle school curriculum was the tie to agriscience and the perceived benefits of offering an agriscience curriculum over the use of a re-vamped, high school, production agriculture curriculum.

### Attitude

If teachers like the curriculum, they will use it. It is difficult to isolate techniques for developing positive attitudes. Since attitudes are developed over time and are complicated constructs, there are no easy solutions to influencing attitudes development. However, educational professionals need to be concerned with developing positive attitudes among agricultural educators to facilitate the adoption of instructional units that are available to middle school agriculture teachers. It is likely that similar support can be found throughout the country for curriculum development if educators would make the effort to seek it.

### Summary and Conclusion

Teachers make the final curriculum decisions in their classrooms. Time is a resource that is often in demand. For middle school curriculum innovations to be effective, they must be adopted and used by teachers.

References


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"Given the lack of sufficient curriculum in middle school agricultural education, it is likely that many programs are using a curriculum that does not meet the needs of the students."
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Although middle school agriculture programs have existed for many years, there has been little effort to develop curricula suited for the middle school student. As curriculum development efforts increase, teachers will be faced with a decision to adopt new curricula or continue teaching what they have always taught. Teachers will be more likely to adopt a new curriculum if they perceive it will benefit the students, if they like it, and if they know how to teach it.

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"The appropriate curriculum for middle school agricultural education is still under construction (Hansen & Miller, 1988). In many cases the lack of a middle school curriculum has led to the adjustment of high school curricula to the middle school level."
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Coming in November...

Research Findings: Using What We Know to Improve Teaching and Learning
A Status Report of Middle and Junior High Agricultural Education and FFA Programs

Middle schools provide an excellent opportunity for middle and junior high school agriculture programs. Twenty-three topics were listed in the core curricula by the secretaries. The top six topics were: plant science, career exploration, agricultural literacy, animal science, conservation, and mathematics.

Seventeen state FFA executive secretaries (37%) indicated that they provided state level competition for middle and junior high school FFA members. This competition was held in conjunction with the high school FFA events in 14 states. In 16 states indicated that competition was separate from high school FFA events.

Four states indicated that competition included the sixth grade, while 14 states said the competition included the seventh grade. In 17 states said the competition included the eighth grade. The top five competitions included: creed, livestock judging, public speaking, crops, and all contests.

Fourteen secretaries believed there should not be national FFA competition, while seven secretaries encouraged national competition. Four secretaries recommended the following national contests: quiz bowl, essay contests, creed speaking, and tool and material identification.

Twelve secretaries indicated the middle and junior high school FFA chapters were organizing from the high school chapters. Twenty-four indicated the chapters were junior high school FFA chapters. The average dues payment was $33.98, with a range from $50 to $8.

Seven secretaries indicated they used federal funds to finance educational programs in middle and junior high schools. Four secretaries indicated they used state funds, and 31 indicated they used local funds. Twelve secretaries indicated they used agricultural education funds to finance programs, while 10 secretaries said that they used secondary education fund, and four secretaries said they used foundation funds.

The major encourager of middle or junior high school enrollment was the agriculture instructor. Other encouragers included: FFA activities and competitions, livestock exhibits in junior shows, and the program itself.

Twelve secretaries cited the school systems and policies as major barriers to enrollment. Examples included size and state or federal funds, lack of staff to expand programs into the junior high level, lack of available programs, a significant shortage of certified agriculture teachers, and schools that do not want to expand their agriculture staff to accommodate middle school programs.

Agricultural Education and FFA Programs

By ROBERTSE ROBERTSE & N.L. McCaULL McCaULL

Dr. Rosetta is an assistant professor and Dr. McCaul is an associate professor of agricultural education at The Ohio State University, Columbus, OH.

According to the secretaries, the major student benefit of middle and junior high school agriculture programs is improved agricultural literacy. Others cited increased enrollment at the high school level, participation in FFA activities, leadership development and training, reduced student drop-out rate, increased student self-esteem, and career awareness.

Most secretaries reported there were no disadvantages to having students enroll in middle school programs. A few secretaries cited student turn-over as a disadvantage.

Secretaries reported that the major benefit to the state for having middle and junior high level agriculture programs was increased enrollment. They also indicated that the population was becoming better educated as a result.

This study was the first national baseline study of the enrollment in middle and junior high school agriculture programs and membership in the FFA. Based on the results, the following recommendations were offered:

1. Since the FFA is an intracurricular activity, the National FFA Organization, the National FFA Organization, the U.S. Department of Education, and the U.S. Department of Agriculture should encourage development of a middle and/or junior high school agriculture education core curriculum that includes its mission content, goal, objective, learning strategies, articulation with other agriculture programs, and funding options prior to expanding FFA programs for middle level.

2. Agricultural educators at the state and local levels should consider these findings when working with boards of education, administrators, and guidance counselors in establishing policies (including funding, scheduling, staffing) that are conducive to middle and junior high school agriculture education and FFA programs.

Table 1

<table>
<thead>
<tr>
<th>Grade Level</th>
<th>Schools with Agriculture</th>
<th>Students in Agriculture</th>
<th>Ave. Program Length</th>
<th>Schools with FFA</th>
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References


Teaming Science and Agriculture: An Innovative Approach to Teaching Exploratory Agriculture

Agriculture is constantly changing, and we must be ready to change with it. Agricultural education can apply the concepts that the agricultural industry is practicing. For example, conventional farmers worked the soil to prepare the seedbed with several passes across the field. Now, farmers are using no-till, or they are combining technologies to prepare the seedbed, plant the seed, and apply the herbicide in one pass. Agriculture teachers can combine these efforts with science teachers and cultivate the minds of students in one class. Here is an interesting story about how we successfully developed and implemented a new, exciting, agriscience team-teaching concept. We would like to explain the evolution of the new Ag-Life Science course, outline the course, illustrate a day in the class, highlight the benefits of integrating agriculture and science, and share recommendations for team teaching exploratory agriscience.

THE EVOLUTION OF AG-LIFE SCIENCE

The idea of integrating life science and exploratory agriculture into one course developed between two of us on the trip home from Des Moines after we attended an AgScience/Rotte Biology workshop. We discovered answers to achieving our goals by working together as a team in developing a course which integrates science and agricultural concepts.

The 7th grade science curriculum includes three 12-week courses on Earth, Life, and Physical Sciences. We realized that the science concepts taught in the Life Science course could be very easily integrated with agriculture. The three basic parameters of the Life Science course are: plants, cold-blooded animals, and warm-blooded animals. On the agricultural side, there are seven career areas of agriculture that need to be introduced as exploratory agriculture. These seven areas are: production, processing, mechanics, sales and services, horticulture, forestry, and natural resources and conservation.

The challenge was to get both teachers to team teach the goals of both life science and exploratory agriculture. We accomplished this challenge by writing a course guide for the new Ag-Life Science course which directed us to see that our goals could be achieved. The curriculum guide includes the science and agricultural objectives for each week-long unit. In addition, hands-on activities and investigations are listed to apply science and agricultural concepts that are relevant to students' lives.

THE COURSE GUIDE

The course is briefly outlined into 12 week-long units and the agriculture (A) and science (S) objectives that are taught:

| I. Course Introduction and Study Skills for Ag-Life Science |
| A. Seven career areas of agriculture |
| S. Studying skills for science |
| II. Plants - Seeds |
| A. Importance of corn products and co-products |
| S. Germination and types of seeds |
| III. Plants - Seedlings |
| A. Importance of soybeans and products from soybeans |
| S. Plants and functions of roots, stems, and leaves. Photosynthesis |
| IV. Plants - Reproduction |
| A. The horticultural industry and careers |
| S. Anatomy and function of the flower |
| V. Plants - Types of Plants |
| A. Careers in forestry |
| S. Deciduous and coniferous trees |
| VI. Cold-Blooded Animals - Earthworms, Spiders, and Insects |
| A. Earthworms and Soil Conservation |
| S. Plants, functions, and environment |
| VII. Cold-Blooded Animals - Reptiles and Amphibians |
| A. Integrated Pest Management |
| S. Plants, functions, life cycles, and adaptations |

The basic schedule of the Ag-Life Science course is as follows:
- Mondays: Mr. Knoblock and Mr. Foster introduce exploratory agriculture concepts and careers.
- Tuesdays, Wednesdays, and Thursdays: Mr. Foster teaches life science concepts and relates them to agricultural situations.
- Fridays: Mr. Knoblock and Mr. Foster work together in teaching the students to prove the agriculture and science concepts valid through activities and investigations.

This is a flexible schedule that enables students to have the best understanding of each principle. This flexibility also allows the instructors to work more effectively in keeping the students interested.

WALKING THE TALK

Further, we feel that we are walking the talk of science in education. Dr. Robert Martin, professor in the Agricultural Education and Studies Department at Iowa State University, visited the Ag-Life Science class and mentioned that "there has been much talk about science and agriculture working together, but very few teachers are doing it. I am impressed to see how well this is working." Therefore, we took a thoroughly discussed concept, and to our knowledge, achieved what very few schools in Iowa have even attempted to do—team teach science and agricultural concepts.

We have adjusted teaching exploratory agriculture and science methods to the FFA motto: "Learning to do, and doing to learn." We have both learned a lot by doing this innovative teaching concept, and we will continue to team teach science and agriculture using creative teaching techniques so that the students learn more about both subjects.

A DAY IN THE AG-LIFE SCIENCE COURSE

Let's spend a day in class. We have selected one day as an example of how the class is taught. Mr. Foster, the science teacher, says, "Good morning, class," and the class responds with an enthusiastic, "Good morning, Mr. Foster." He takes roll and collects the homework assignment. Mr. Knoblock, the agriculture teacher, touches on the lighter side by telling a story as an interest approach about the young son who was told to go disk the corn field. The lad was out in the field about one hour and his dad decided to go check on his progress. Dad noticed a strange thing. His son had made several round trips but not once with the disk in the ground. The dad stopped the son and asked him what he was doing. The son said, "I am waking up the earthworms." Dad said, "Waking up the earthworms?" The son said, "Yeah. My agriculture teacher told me that earthworms do not like being waked up. I was waking them up so that they had a chance to get away." Mr. Knoblock continues to discuss the different types of tillage systems and directs the class to show how the science concepts apply to an agricultural situation. He leads to the objective of soil conservation methods, such as leaving residue on the surface by burns. Mr. Knoblock sets up the investigation by asking the question, "What can farmers and agri-
given directions and the lab guide. The lab guide has questions about earthworms and their role in agriculture. The guide helps the students apply the science concepts and serves as a study guide and an evaluation of the lab. The students rotate from station to station following the lab procedures and answering the questions, while the teachers move around the room assisting the students and answering their questions. The students close the day by helping with clean-up under the direction of the two teachers. The students hand in their lab guide, and Mr. Foster summarizes the main concepts of the activity.

THE BENEFITS AND CHALLENGES

We feel that the new course is very successful because we see the students learning and applying science and agricultural concepts. Some of the benefits we have experienced in team teaching Ag-Life Science include:

- A simple concept of one area of agriculture can be expanded and explored by the science teacher.
- Science concepts are applied to everyday life, since agriculture literally exists everywhere in everyone's life.
- Community examples are highlighted and incorporated into the instruction, because of the unique rural/urban environment of Kalona (2,000 population) and Iowa City (50,000 population).
- Urban, university resources, such as the University of Iowa and Iowa State University, are used in the course, which shows the interconnectiveness of science and agricultural concepts.

- Easier scheduling of exploratory agriculture by the principal and counselor because there is not another class added to the schedule.
- The synergistic effect allows the instructors to cover more material more effectively than if they were teaching two separate courses.
- The instructors motivate each other to be better teachers, and their enthusiasm energizes the entire class.
- The students are highly motivated because some views are presented.
- The "hands-on" activities are easier to conduct because more hands make the work lighter.
- Grading and observations are easier, and there are more ways to evaluate the students.
- Students retain the concepts better because parents have expressed that their children talk about what they learn in Ag-Life Science.
- The agriculture teacher gets to work with seventh-graders and teaches them about agricultural careers; this should help recruit students to take agriculture courses.

We admit that our team-teaching experience has been very positive; however, we will also admit that there can be frustrations, such as:
- Finding time to plan between the two teachers.
- Fitting in all the activities.
- Adopting a workable grading and evaluation plan that would be agreeable by both instructors.
- Reporting the grades of the course to show that it is an agricultural science course on the report card and student records.

RECOMMENDATIONS

We strongly recommend that teachers who are interested in seeing students excited about science and agriculture try the team teaching approach. In summary, we make the following recommendations to teachers who are interested in team teaching agriculture and science:

- The agriculture and science teachers should share their course goals, content, and schedules.
- The teachers should team teach a short unit to compare the compatibility of teachers and course objectives that are to be taught.
- Select a course that the agriculture teacher can apply science concepts to agricultural situations.
- The teachers should be flexible and openly communicate their ideas.
- Develop a course guide that will direct the new course.
- Document everything you teach—successes and failures. Record every idea.
- Review the total course periodically. Revise the course guide using documentation.
- Keep your principal informed about your course. Give him/her a copy of your course guide.
- Publicize the class in the media.
- Allow the students to have ownership of the class.

CONCLUSION

We feel that Ag-Life Science has enriched our teaching and curricula. This new course has bolstered student enthusiasm and community involvement. Further, it has given our school a sense of place in the community that did not exist before this course was taught. Moreover, the class has brought the agriculture and science departments into a working relationship that gives teachers and students new avenues to explore and integrate agriculture and science in their lives. As agriculture continues to change, agriculture teachers need to look for new ways to teach students with other teachers.

Agriscience Contests...

(continued from page 11)

from the categories listed. Pictures or actual specimens may be used. A common list of plants, seeds, fruit, and equipment is used to secure specimens. Members also demonstrate one of the following skills: transplanting, taking leaf/stem cuttings, or sowing seeds. The written test consists of 25 multiple choice questions concerning the following topics: plant care, identification of plant parts, methods of reproduction, garden designs, site selection, new technologies, and careers. The problem solving component consists of five activities, such as fertilizer analysis, reading a label, using appropriate horticultural tools, measuring skills, plant care, problems and diagnosis, and pesticide safety.

References used for this contest include:

Agriscience Fundamentals and Application, Introduction to Hortic., NASCO catalog, various seed catalogs and plant identification charts, and Reader's Digest Illustrated Guide to Gardening Crop Production.

The sixth event for middle school FFA members is an Agriscience Fair. Seventh and eighth grade members place each grade level is separated into two divisions: educational and experimental. Chapters may enter one project in each division for a total of four entries. This gives members an opportunity to expand their applications of science in many areas of agriculture. The projects can be placed according to their strength in the following areas: agriculture and scientific thought, creativity, understanding, clarity, dramatic value, and technical skill.

References for this fair may include: The Agricultural Education Magazine (August 1991), Kollective Journal (Dec. 6, 1991), and Search—A Research Guide for Science Fairs, by Connie Wolfe.

These six curriculum-driven competitions are the first steps to motivating and exciting middle school members to participate in FFA activities. They are a much-needed learning opportunity for a group of individuals which has been neglected thus far. Middle school members are the customers we need to serve if our current FFA programs are to continue. This may be the key that opens the door to stronger, more active high school FFA chapters!
Building the Case for Middle Grade Agricultural Education

Career education is making a comeback. Like a phoenix from its own community seems to be re-discovering what vocational educators have long known: Students need learning experiences that help them make sound career-related decisions. Information in this article may help teachers and administrators in their mission of providing these learning experiences at the middle grade (grades six through eight) level.

Interest in agricultural education and other career-related programs in the middle grades has increased in recent years, partly due to educational reform efforts and to an expanded knowledge base related to early adolescent education. This article examines aspects of school reform legislation, as well as characteristics of early adolescents (ages 10 to 14 years), which underscore the importance of career-oriented middle grade programs. Because state-level decision makers have an integral part in implementing and maintaining these programs, related perceptions and opinions of state vocational education directors and supervisors are also examined. Included is information on how agricultural education "fills the bill" in the middle grade level.

School Reform Legislation
In many recently passed School-To-Work Opportunities Act builds the case for career-oriented programs at the middle grade level. By requiring students to elect a "career major" prior to the beginning of the eleventh grade, the act reinforces the notion that students need to begin preparing for their life's work before reaching the high school grades. Certainly, the career major aspect of the act emphasizes the need for career-oriented programs long before the junior year of high school.

In many states, vocational education has played an important role in preparing young students to make career decisions through various courses at the middle grade level. Based on current school-to-work transition legislation, it seems reasonable that vocational education and agricultural education can play an even greater role in the future.

Characteristics of Early Adolescents
Middle grade curricula and student activities should be based on the needs and characteristics of early adolescents. An important task of the middle grade school is to help students develop social skills (Lipsitz, 1984). The curriculum should also provide early adolescents an understanding of various career roles in society (Carnehour & Wicks, 1980). Development, 1989). However, Sale (1979) emphasized that job training is not an appropriate function of the middle grades. Although the middle grade curriculum, early adolescents should have opportunities to learn through hands-on experiences, acquire commonly used practical skills, and develop personal values (Kendred, Wooldrich, McElvain, Copenin, & Dyson, 1976; Curiss & Bidwell, 1977; Greenberg & Hunter, 1982).

... students need to begin preparing for their life's work before reaching the high school grades.

Student organizations play important roles in the education of early adolescents. These organizations allow students to explore personal and career interests, as well as develop social and leadership skills (Kimoto et al., 1976; Miller, 1985). Because of wide variations in the development levels among early adolescents, it has been recommended that participation in activities take precedence over competition in the middle grades (Brazee & Smalley, 1982). Recognizing potential problems associated with middle grade competitive activities, Rossetti, Padilla, and McCallic (1992) recommended that the National FFA Organization not develop contests at the national level for its middle grade members.

What Do State-Level Administrative Think?
A recent study examined the perceptions and opinions of state vocational education directors and agricultural education supervisors related to aspects of career-oriented programs at the middle grades (Barrick & Hagans, 1994). The study revealed that middle grade agriculture programs are offered in over two-thirds of the states, with the primary focus being on career exploration. The following conclusions are based on results of the study. State vocational directors and supervisors believe that:
1. career-oriented courses can help middle grade students understand the world of work;
2. career-oriented courses can contribute to the intellectual development of middle grade students;
3. career-oriented courses can help middle grade students develop their personal values;
4. career-oriented courses can help students be better prepared to make career-related decisions;
5. career-oriented courses can contribute to the social development of middle grade students;
6. the concepts of career-oriented education should be incorporated throughout the middle grade curriculum, as well as taught in courses specific to the career area; and
7. team competition is preferable to individual competition as a part of middle grade vocational student organization activities.

How Can Agricultural Education Fill the Bill in the Middle Grades?
Based on what is known about early adolescents and the opinions of state-level administrators of vocational education, how can agricultural education benefit the middle grade student? Following are ways that agricultural education can help early adolescents make the transition from childhood to adolescence and be better prepared to make career related decisions, such as those required in school-to-work legislation.

Social Skills and Personal Values
Through FFA activities and community service, work, middle grade agricultural students can learn the importance of teamwork and develop social and leadership skills. FFA also allows students to explore various agricultural careers through contests and related activities. While there are certainly beneficial aspects of FFA contests for early adolescents, emphasis should be placed on participation for all students rather than on competition.

Understanding the World of Work
Agricultural education offers middle grade students numerous opportunities, both in and out of the classroom and lab, to explore agricultural careers. Practiced, hands-on activities in the school setting expose early adolescents to workplace practices. Through supervised agricultural experience (SAE), students may explore agricultural careers through job shadowing or research and gain actual work experience through entrepreneurship or placement programs. Early exposure to a wide array of career options helps students to be better prepared to make career-related decisions.

Intelectual Development
Many academic competencies and problem-solving skills promoting intellectual development are incorporated into the agricultural education curriculum. These competencies and skills help early adolescents apply knowledge and see the relevancy of school. SAE programs provide excellent opportunities for students to work independently, gain knowledge, and learn through discovery.

Delivery of Agricultural Concepts and Career Information
There is debate related to the system for delivering agricultural concepts directly to middle grade students. At issue is whether information related is best delivered through courses specific to the career area or by incorporating the information throughout the curriculum. Agricultural education fits neatly into a variety of delivery systems and strategies. As a stand-alone course, agricultural education provides middle grade students with opportunities for in-depth study of agricultural careers and concepts. Agricultural concepts are also easily incorporated into science, history, social studies, and other subject matter units. Regardless of the delivery system, the important point is for middle grade students to be exposed to the wide field of agricultural occupations and related concepts.

Summary
Middle school agriculture programs can and do work. State vocational education directors and agricultural education supervisors see the need for and positive benefits of middle school programs. Teachers and school administrators contending the fate of agricultural education for middle grade students must consider how well the program addresses educational reform initiatives, educational needs of early adolescents, and the perceptions and desires of state-level decision makers. From social, intellectual, and vocational perspectives, the benefits of practical skills, agricultural education and other career-oriented programs serve the middle grade student well.

One caution needs to be addressed — simply transferring existing programs of agricultural (continued on page 26)
Why Middle School Agriscience?

Over the past decade agricultural education has undergone numerous changes due to the revolution in technology, industry, and the business of agriculture. Seeking advancement with the changing world, agricultural education demands new teaching approaches at an earlier age which will result in new directions for learning. Concerns about the changing workplace and increasing technological requirements have alerted educators, scientists, business leaders, and others to the need to boost student interest and understanding of math, science, and technology. Middle school agriscience serves as a mechanism that can integrate biological, technological, and mathematical concepts by using agricultural topics. Agriscience is the key at the middle school level for beginning a feeder system for high school programs of this type. As proper training in agriscience was seen at the middle school level, adoption of such a course is easier said than done. Establishing approval, developing sound arguments, and anticipating administrative concerns are only a few keys to opening the opportunity for establishing an agriscience program at the middle school level.

Winning the Approval

As with any new program seeking endorsement, the principal is imperative. One must be able to clearly communicate a need for establishing an agriscience course. The agricultural educator must present the principal with his/her model of instruction and the benefits of the agriscience course to students, the total school program, and the community. Other key supporters should be sought within the school system by reaching out and sharing the proposal with teachers in the school, advisory groups, administrative staff, school board members, parents, and students. The key to winning approval is to set goals high, be organized, and have long range plans in mind. Key decision makers need to have a clear understanding of the benefits agriculture can play in increasing students’ interest in math and science by connecting principles to agriculture.

Promoting an Agriscience Course at Middle School Level

The prevailing middle school concept is one of providing students with exploratory, hands-on experiences. Agriscience can build on basic science skills acquired in elementary school and expand the science curriculum at a higher level. By exposing students in agriscience to subject areas in agriculture, students will not only gain skills in science and math, but also become acquainted with careers in agriculture and develop an appreciation for modern agriculture. Incorporating leadership skills in the agriscience curriculum can develop more self-directed learning at an early age in preparation for high school.

Middle school agriscience can provide a positive learning environment to meet the unique and personal needs of pre- and early adolescents. Agriscience is suitable for integrating curricula to meet the needs of all students, regardless of ability level. With the full inclusion movement in public education, agriscience opens new opportunities for creative teaching and stimulates student interest in the natural science process at all ability levels. Other learning opportunities, such as leadership development, may be explored for use with a diverse student population, an area not offered in the regular science curriculum.

With the multitude of agricultural topics, the agriscience curriculum may be designed to maintain student interest throughout the school year, perpetuating student curiosity of what will be learned next. The agriscience curriculum requires consolidation with science courses in existence at the middle school to meet district, state, and national competencies.

Developing Leadership Skills at the Middle School Level

Agricultural education has a standing tradition of providing students with leadership skills and opportunities. Agriscience students at the middle school level would be served well by learning basic leadership, building student confidence, and promoting active classroom participation and student activities. Teaching leadership to students will allow agriculture teachers to lay the foundation for students to begin setting personal goals and goals for the FFA chapter.

Incorporating leadership into the agriscience curriculum at the middle school level creates interest in other educational extracurricular activities, such as contests that are provided by FFA involvement. The extracurricular activities at the middle school level unlock opportunities for students to experience academic competition that augments traditional sports competitions. Through the extracurricular experiences offered through FFA involvement, students work doubly hard; FFA involvement also serves to promote students’ overall academic performance.

Administrative Concerns

The concern held by most administrators at the middle school level is the operating expenses of this type of course. A plausible reason behind this concern is because most administrators equate agriscience to the old, vocational, hands-on approach in an industrial shop environment and the large cost of this type of program. Costs of maintaining and operating an agriscience course are equal to other science courses offered in a typical middle school. The agriscience teacher needs to envision and plan a budget of all anticipated expenses for carrying out a model instructional program. However, an agriscience course integrating FFA activities may realize travel expenses. These expenses may be met by involving FFA alumni and members in fund-raising activities.

Another concern administrators have is obtaining a qualified agricultural educator.
Essential Elements of the Problem-Solving Approach to Teaching

The agricultural industry is rapidly changing through innovation and the advancement of technology. Future employees in the industry of agriculture (i.e., our students) will be required to use critical thinking skills to make decisions and solve problems. Although not a new concept to agricultural education, the profession recently re-emphasized the teaching of decision-making skills through problem-solving (American Association for Agricultural Education, 1991).

The problem-solving approach has been regarded by many in the profession to be among the most effective teaching strategies (Martin, 1985). A rationale for using the problem-solving approach to teaching was provided by Phipps and Osborne (1958) when they stated that problem-solving "... stimulates interest, develops thinking ability; and helps students to evaluate, draw inferences from, and make decisions essential to the solution of a problem" (p. 150).

Crunkilton (1988), in his address to the profession, stressed the importance of problem-solving by stating that "... problem solving, both as a method of teaching and a skill that students need, is more critical today than it was years ago." As a profession we have advocated teaching students decision-making skills through problem solving. However, are we really teaching the essential elements of the problem-solving approach in our teaching?

Essential Elements

The first and foremost essential element in teaching the problem-solving approach is defining the problem to be solved. Students must be involved in identifying and developing a clear definition of the problem to be investigated.

Problems to be solved should be true to life, real problems of the students, and/or problems that students could potentially face later in their chosen careers. Teachers should identify and also challenge students to identify occupations that would require the solving of the problem under investigation. By relating the problem to occupations of interest to students, a larger number will see the need in solving the problem and therefore will be more likely to become interested in solving the problem.

Stewart (1959) may have communicated it best when he stated that a "problem must be stated clearly and definitely, it must be appropriate in scope and difficulty; it must involve thinking of quality and quantity; it must be true to life and otherwise interesting to the pupils" (p. 88). After nearly 35 years, Stewart's words are still applicable today.

After students have clearly defined the problem to be solved, they should be advised in seeking the data and information necessary to solve the problem. Teachers may choose to use one or more of the many teaching methods available during this, the second essential element of problem-solving. Teaching methods could include demonstrations, experiments, field trips, supervised study, or others that allow students to collect the needed information to solve the problem.

With the data and information collected, students should be ready to formulate possible solutions and recommendations to the problem. During this, the third essential element of problem-solving, students should be encouraged to use their critical thinking skills to analyze and evaluate the data and information in developing a potential solution and/or recommendations. Again, teachers may use one or more methods of teaching to guide students in formulating possible solutions or recommendations to the problem under investigation.

The fourth essential element of teaching using problem-solving is the application of the concepts, principles, and/or skills learned. This element of the problem-solving approach provides students the opportunity to try out their proposed solutions or recommendations to the problem. It is often during this element of the problem-solving approach that students receive "hands-on" learning and practice.

Once students have had the opportunity to apply their proposed solutions and/or recommendations they should be led through the final essential element of problem-solving, the evaluation. It is during this element that students should be encouraged to think at their highest cognitive level and determine if and how well their solution or recommendation solved the problem. This element may also be utilized by the teacher to evaluate students' learning.

Teaching students using the problem-solving approach can be rewarding, yet challenging.

(continued on page 26)

Ignorance Is Not Bliss!

"Ignorance is bliss." - Thomas Gray's time-worn phrase may be true, but it does not help promote diversity in agricultural education. Diversity in agricultural education means that all students from all cultures and backgrounds are in agriculture classes and the FFA. When we understand and teach about other cultures, our classes become more attractive to students of all cultures. For example, African-American students could be more interested in the FFA if they were aware of their heritage as it relates to the FFA.

In the early days of agricultural education, schools in the South were segregated with separate youth organizations for black students—the New Farmers of America (NFA). The NFA is an important part of our heritage. On the occasion of the NFA and FFA merger, Adolphus Wilson, the NFA president, stated, "Please be reminded that the spirit of the New Farmers of America does not die here today. Rather we awake to the dawn of a new day. Together we walk into the dawn as Future Farmers and toward a fuller realization of our educational aims and purposes."

"Remembering the spirit of the NFA can help agricultural education in its quest for greater diversity."

How much do you know about the NFA? To help you learn more about the NFA, the following quiz has been developed (the answers are found at the end of the quiz). You may want to use this quiz with your students.

The NFA

1. The student organization for African-American agricultural students prior to school integration was

A. National Farmers of America
B. Nubian Farmers of America
C. Negro Farmers of America
D. New Farmers of America

2. The national NFA organization was started in

A. 1928
B. 1929
C. 1932
D. 1935

3. The NFA was divided into:

A. Two sections
B. Three sections
C. Four sections
D. No sections were needed because the organization was limited to the South

4. The NFA degrees were:

A. Farm Hand, Improved Farmer, Modern Farmer, Superior Farmer
B. Farmer, Farmer Owner, Landlord
C. Greenhand, Chapter Farmer, State Farmer, Dixie Farmer
D. There were no degrees in the NFA

5. The "Father" of the NFA was:

A. Booker T. Washington
B. George Washington Carver
C. George Washington Owens
D. Fred McChesney

6. The NFA colors were:

A. National Blue and Corn Gold
B. Black and Cotton White
C. Black and Old Gold
D. Forest Green and Cotton White

7. The NFA emblem differed from the FFA emblem in that it had:

A. A cross section of a cotton boll
B. A male pulling the plow
C. The sun high in the sky
D. No eagle at the top

8. National NFA week was during the week of April 5. This was because:

A. It marked the start of spring
B. The NFA was incorporated on April 5
C. The Emancipation Proclamation was signed on April 15
D. Booker T. Washington was born on April 5

9. The NFA conventions were generally held in:

A. Nashville, Tennessee
B. Atlanta, Georgia
C. Charlotte, North Carolina
D. Petersburg, Virginia

10. The NFA merged with the FFA in:

A. 1945
B. 1963
C. 1965
D. 1969
E. 1976
The NFA Quiz - Answers

1. (D) New Farmers of America. The organization had its roots in the New Farmers of Virginia which was started in 1927.

2. (D) The NFA organization held regional meetings in 1929. In 1935, the organizational meeting for an official national association was held at Tuskegee Institute.

3. (B) The NFA was divided into three sections. The Washington section (named for Booker T. Washington) consisted of North Carolina, South Carolina, Virginia, Maryland, Delaware, West Virginia and New Jersey. The Alabama section was composed of Alabama, Georgia, Florida, Tennessee, and Kentucky. This section was named after Dr. H.B. Sargent and was composed of Georgia, Alabama, and Mississippi. The section name comes from the last letter of each state in the section.

4. (A) There were 4 degrees in the NFA: Farm hand, Improved Farmer, Modern Farmer, and Superintendent.

5. (C) George Washington Owings, an agricultural professor at Virginia State College, is considered the founder of the NFA. He was instrumental in starting the Future Farmers of Virginia and was active in establishing the NFA.

6. (C) Black and Old Gold were the NFA colors.

7. (A) The NFA emblem was exactly like the FFA emblem except it was black and gold and contained a section of a cotton boll instead of the ear of corn.

8. (A) NFA work was held during the week in which Booker T. Washington was born, April 5. The NFA treasurer was stationed at the picture of Booker T. Washington.

9. (D) Atlanta, Georgia, was the home of NFA conventions from 1940 to 1965. Prior to that, the convention was rotated among the states.

10. (C) The NFA convention was held in Atlanta in October of 1965. The convention allowed the NFA to increase its members and choose headquarters for Kansas City as the FFA convention. An impressive ceremony was conducted in which the NFA merged with the FFA.

Conclusion

While addressing the FFA convention in 1965, Adolph Pinson, the last NFA president, said, "There is an increased emphasis on the society. It is important. There is so much. We strive for unity for agricultural education by remembering the NFA. This can help African-American students feel a stronger bond with agricultural education and the FFA. As teachers, we should include the history of the NFA in our curriculum. Ignorance is not bliss.

Essential Elements of . . .

experience. It takes hard work and creative thinking on the teacher’s part to develop problems to teach the subject content and still relate to as many students as possible.

No one has proposed that teachers of agriculture teach all their subject content through the problem-solving approach. However, if we are going to prepare our students for a rapidly changing agricultural industry, we must teach them how to make decisions through problem-solving skills. After all, there is no better way to learn problem-solving skills than through participating in problems-solving.

References


Barnes, J.K., & Hughes, J.M. (1994). Building the Case for . . . (continued from page 21)

Building the Case for . . .

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The EARTH and AGRISCIENCE
by John R. Crunkilton, Susan L. Osborne, Michael E. Newman, Edward W. Osborne, and Jasper S. Lee

The Earth and AgriScience is an introductory agriscience book for grades six and seven, with application in the fifth and eighth grades. It is written at the sixth grade reading level. Numerous color photographs, color line art, and color text will enhance the use of the book for the student. The Earth and AgriScience is in full-color, cover to cover. It will be used in 9-week, semester, or year-long courses. Each part (unit) of The Earth and AgriScience may be used as a stand-alone short course where courses are not semester or year-long.

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AGRISCIENCE INTEREST INVENTORY
by Mary Beth Bennett, Samuel M. Curtis, Robert A. Martin, and Paul A. Schlotfeldt

The AgriScience Interest Inventory focuses on determining the level of interest of middle school students in the following seven occupational areas of agriculture: 1.) Production Agriculture, 2.) Horticulture, 3.) Agricultural Mechanics, 4.) Agricultural Products, Processing & Marketing, 5.) Renewable Natural Resources, 6.) Agricultural Supplies & Services, and 7.) Forestry.

The interest inventory packet is totally self contained. Each packet includes a disk containing the inventory as well as a 16-page user's manual. The information is organized so that it may be operated by students wanting their information profiled. The instrument is self-scored and generates a profile of the students' score for each occupational area as well as a total score for the inventory.

The AgriScience Interest Inventory is not a test of ability or knowledge, but is an assessment of current interest in various aspects of agriculture. It is concerned solely with a student's expression of a degree of like or dislike for each of the 100 activities.

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