

## Understanding the CASE Model

Curriculum for Agricultural Science Education™ (CASE™) is much more than just curriculum. In fact, CASE is a system of instructional support for the classroom teacher like no other resource in agricultural education today. The CASE model provides four major areas of support to promote solid classroom instruction using rigorous and relevant lessons while enhancing student learning.

The four areas of teacher support include curriculum, professional development, assessment, and certification. Each area contributes to the validity of CASE instructional materials by ensuring that teachers are properly equipped and trained and student learning is clearly accountable. This document will explain the components that define the CASE model.

### Background

The call from Perkin's reform stresses Career and Technology Education (CTE) subject matter should be integrated with science and mathematics while providing a structured sequence of courses. Educational research suggests that student-learning opportunities are enhanced when the instruction provided is rigorous to challenge student thinking and relevant to engage active participation. Considering these aspects of CTE reform, agricultural education is positioned very well to prosper in our current educational system and provide students valuable learning opportunities in agriculture subject matter.

The National Council for Agricultural Education (NCAE) established a long range goal for Agricultural Education to increase growth and quality of our programs. To facilitate the development of quality programs the NCAE identified eight initiatives. The third of eight initiatives calls for the creation of a curriculum model to establish a sequence of agricultural education courses that enhances the delivery of agricultural education.

The CASE project was established to provide a structured sequence of courses, but CASE also serves as a model for elevating the level of rigor and relevance expected for the new vision of agricultural education. Rigor of CASE is validated by the alignment of lessons with national standards for agriculture, science, math, and English language arts.

For connection of relevance with student learners, the CASE curriculum highlights the strengths of experiential learning, the heart and soul of agricultural education, by utilizing activity-, project-, and problem-based instructional strategies. To provide the technical guidance in curriculum development using this approach, the NCAE sought out a partnership with Project Lead the Way, Inc. (PLTW®). A nationally recognized

curriculum development organization, PLTW<sup>®</sup> has successfully designed and implemented courses based on the rigor and relevance philosophy.

Of the many strengths of agricultural education, leadership, experiential learning, and character education are three pillars. CASE does not ignore the three-circle model of agricultural education that represents the efforts of over 80 years of practice. Classroom instruction is enhanced to meet the needs of today's agricultural students without sacrifice to FFA and SAE instruction. Both FFA and SAE are integral components of CASE as well as LifeKnowledge<sup>®</sup> connections.

CASE will develop eight courses for secondary agricultural education programs to offer. Once all eight courses are released and implemented, CASE will determine combinations of courses that will constitute a Program of Study. A Program of Study will provide students a minimum of courses required to understand and learn the knowledge and skills related to the National Agricultural Science Content Standards. The following is a list of the eight courses in the CASE sequence:

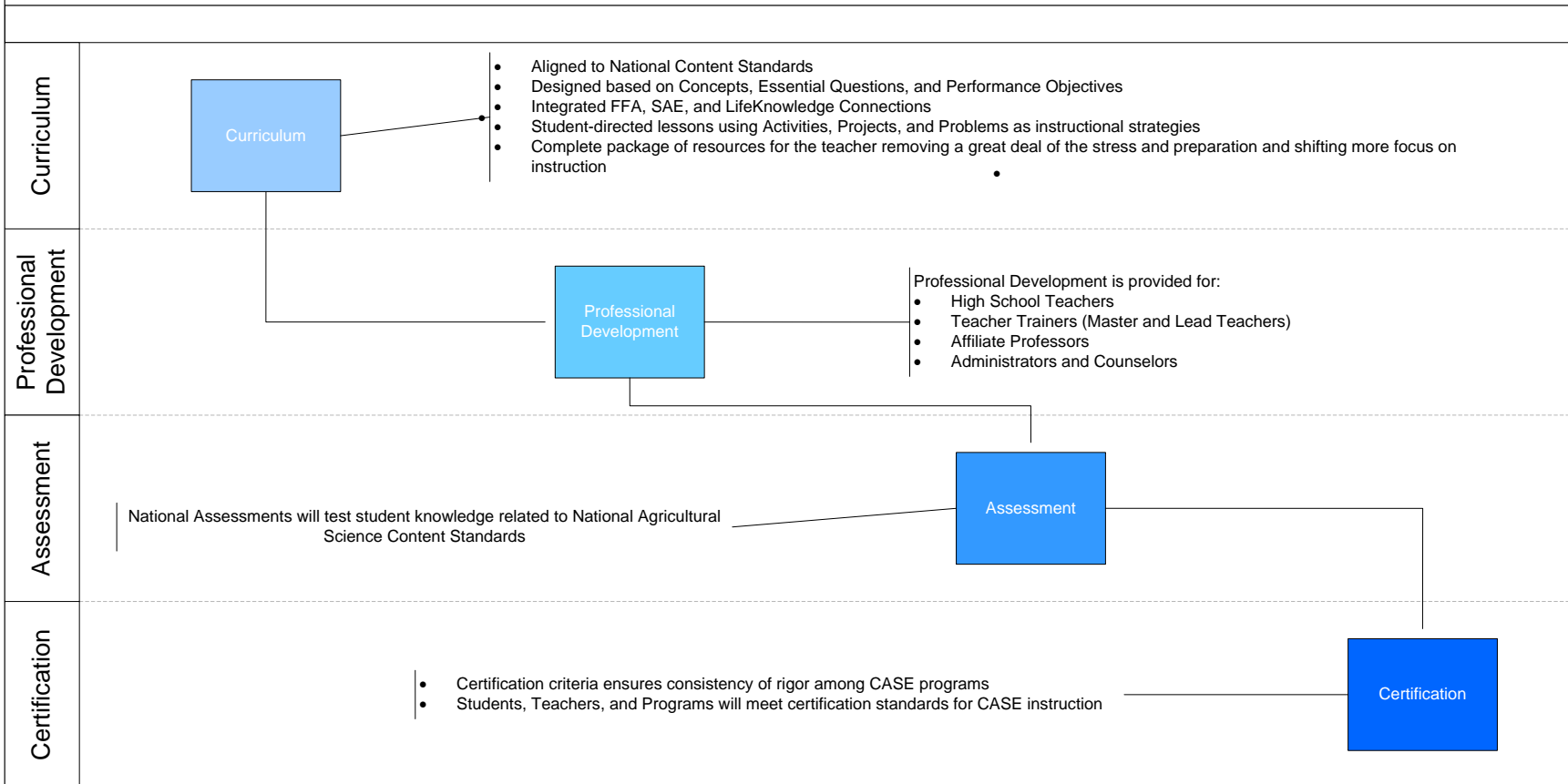
- Introduction to Agriculture, Food, and Natural Resources
- Principles of Agricultural Science – Animal
- Principles of Agricultural Science – Plant
- Agriculture Technology and Systems
- Animal and Plant Biotechnology
- Food Science and Safety
- Natural Resources and Environmental Sciences
- Agricultural Sciences Research and Development (Capstone)

It is important to note that CASE is not designed to replace traditional agricultural education programs. The goals of CASE are to improve the retention of professional teachers in agriculture and generate interest in districts seeking an alternative model for agricultural education instruction. However, the developers of the CASE curriculum are confident that CASE can provide value to any program in almost any situation. The lessons are pedagogically sound and the teacher support system is truly powerful.

## The CASE Model

The remainder of this document provides detail into the four components that comprise the system of the CASE model. This model has been used in the development and implementation of the very successful PLTW<sup>®</sup> curriculum for secondary engineering and biomedical subject areas. With CASE, agricultural education finally has a complete model for curriculum delivery.

## Curriculum for Agricultural Science Education (CASE) Model



# Curriculum

## Curriculum Features

CASE courses provide the teacher a comprehensive package of all teaching resources required to instruct lessons. Each lesson plan contains teacher notes, PowerPoints<sup>®</sup>, student activity instructions, and assessments. Lessons are designed to provide everything the teacher needs at a click of the mouse. The philosophy behind a CASE lesson is to empower the student by providing students an active role in their learning rather than learning being a product of teacher led instruction.

Activity, Project, and Problem (APP) modalities refined by PLTW<sup>®</sup> are the primary instructional strategies used to enhance the rigor of content and relevance of experience. APP modalities refer to the use of activities, projects, and problems used as the modes of guiding students through the learning experiences. Student-directed learning and inquiry based instruction is established using the APP modalities of learning.

## Curriculum Development

*“Curriculum Written by Agricultural Educators for Agricultural Educators”*

The CASE curriculum truly is written by agricultural educators for agricultural educators. Each new course begins by assembling a group of secondary and post-secondary agricultural educators along with industry representatives for a respective subject. These individuals, who have been nominated by their state supervisors of agricultural education, determine the essential topics and key concepts that students should know, understand, and be able to do related to the subject. This first stage of the curriculum development process is called kernel development. The product from the kernel development meetings will yield key concepts, terminology, resources, and activities used to assist the writers of the course.

A curriculum director will coordinate much of the writing of the course; however, kernel teachers are provided an opportunity to contribute by writing lessons. If teachers choose to undertake the writing of a lesson, they are compensated for their time and creative work. The more teacher writers involved in a course provides a rich diversity of instructional strategies and creative approaches.

A CASE course is subjected to several validation steps once an initial draft is written. Pilot testing is done with a team of teachers (usually from the kernel development group) to try out lessons, find points of improvement, and assess the rigor and relevance of the lessons and activities. Pilot testing provides the Curriculum Director valuable feedback to adjust the curriculum for length of instructional time, clarity of instructions, and correction of errors.

Before a new CASE course is released, the complete course is field tested by a select group of secondary agricultural educators. The field test teachers will use the curriculum as designed from Day 1 to Day 175. Feedback from the field test allows for further adjustment to the course and provides critical information about timing and flow of lessons.

A CASE course is never in a “final draft”. Curriculum directors keep detailed notes of comments by teachers and solicit constant feedback about the course. Every three years a CASE course is reviewed and revised to reflect the changes that teachers suggest or to stay current with trends in science and technology.

## **Teacher Services**

CASE courses have several unique features to assist teachers with preparation and instruction. Every resource the teacher needs to implement lessons and activities is included in the teacher resources section of the courses. Each lesson includes teacher notes that describe detailed instructions about how to teach each activity, project, or problem. In the teacher notes, exemplars are provided of student work to help the teacher determine the quality of work their students must achieve.

PowerPoint® slides have suggested teacher comments provided to help the teacher explain the content of the slide or enrich the examples the teacher will use to help students understand the concepts. Assessment help is provided to the teacher as well. Included in each CASE lesson are scoring rubrics to assess projects and problems. Besides rubrics, answer keys are provided for various activities and Check for Understanding quizzes.

As CASE progresses in the future, a virtual academy is planned to enhance teacher resources. The virtual academy will be a website that teachers can access video clips of teachers providing instruction of activities. This resource will assist the professional development efforts of the CASE Institute as a way to help teachers recall what was taught during the CASE Institute or fill in activities that could not be included during the professional development sessions.

## **Professional Development**

### **CASE Institutes**

A CASE Institute is a professional development workshop to provide teachers training for the instruction related to a specific CASE course. Once a teacher has successfully completed 80 hours of intense professional development at a CASE Institute, the teacher is certified to teach the specific CASE course.

CASE Institute sessions provide teachers important background related to the pedagogy used in CASE curricula and practice teaching various lessons to prepare them for classroom instruction. Teachers are required to attend the entire 10-day workshop and CASE Institute instructors determine if each teacher is adequately prepared to provide instruction using CASE curricula.

### **Lead Teacher Orientations**

CASE has two levels of teacher trainers called Master Teachers and Lead Teachers. Master Teachers are teacher trainers who have attended a CASE Institute for a specific course, provided instruction to secondary students in that course for at least two years, and conducted a CASE Institute as a Lead Teacher for at least one year.

Lead Teachers are teacher trainers who have attended a CASE Institute for a specific course, provided instruction to secondary students in that course for at least one year, and attended a Lead Teacher Orientation Session prior to teaching their first CASE Institute.

Lead Teacher Orientations provide prospective Lead Teacher candidates training related to delivering a CASE Institute. Because CASE Institute sessions reduce 175 days worth of instruction into 80-hours of instruction, CASE Institute trainers must analyze and evaluate each component of the curricula to create a well-balanced and effective professional development experience. Lead Teachers will understand how to create a scope and sequence and refine delivery skills for teaching to an adult audience.

Once Lead Teachers have successfully completed an orientation they have the potential to be selected by CASE staff to co-teach a CASE Institute session with a Master Teacher.

### **Administrator and Counselor Workshops**

Administrators and counselors in many schools are the gatekeepers of students entering programs. CASE identifies the need to provide conferences to educate administrators and counselors about what CASE can do for their students and what types of students should be encourage to enroll into CASE courses. These are single day conferences designed to assist teachers with student recruitment into their program and help administration understand the importance of CASE certification of programs, teachers, and students.

### **Affiliate Institutions**

Affiliate institutions are colleges and universities that provide services to CASE teachers from their state and many neighboring states. Affiliate programs have staff that successfully complete a CASE Institute and potentially are Master and Lead Teachers. Affiliate institutions host and manage CASE Institute sessions, provide graduate credit to CASE Institute participants, and work with local school districts to promote and enhance CASE courses.

## **Assessment**

### **Learning Reflections**

Student reflection is built into every CASE lesson and activity. Essential questions are identified for each lesson to guide student thinking throughout the course of instruction. Each activity, project, and problem feature conclusion questions to encourage students to reflect on the activity and to assist them in making the connections between the learning objectives of the activity and the concepts of the lesson. Essential questions and activity conclusion questions can also be used by the teacher as formative assessment measures.

## **Check for Understanding**

Check for Understanding is a short quiz related to the concepts and performance objectives of each lesson. Teachers are provided this resource to use as a summative assessment for the lesson or formative evaluation tool as students progress through the unit. Answer keys are provided to the teacher for convenience and consistency of scoring.

## **Unit and End-of-Course Exams**

Field-testing of CASE courses will determine the scope of unit and end-of-course examinations. At the present time, CASE is deciding upon the delivery system for end-of-course exams and how information collected will be used to assist in course revisions.

## **National Assessment Exams**

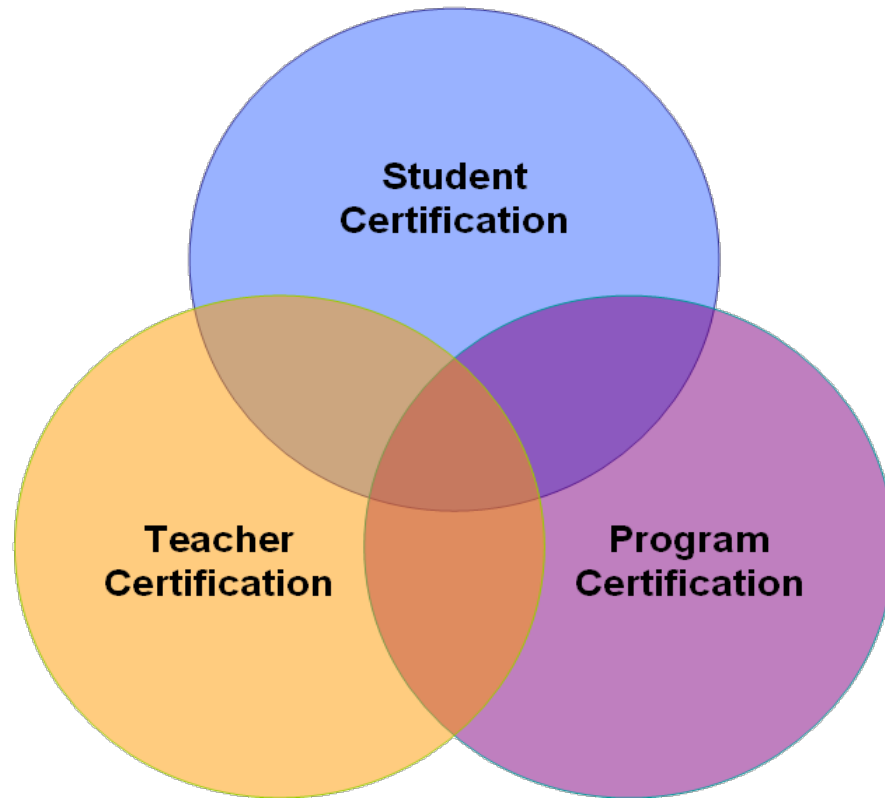
Once CASE specialization and capstone courses have been developed and released for implementation, a recommended sequence of courses will be defined to constitute a Program of Study. National Assessment Exams will be created as a summative assessment for completers of a CASE Program of Study. Expect the development of this phase of the CASE program by 2015.

## **Certification**

The extended value of CASE curricula is the overall certification of students, teachers, and programs. To ensure that the quality of instructional experiences are provided to students the way they are intended by design, certification of teachers and programs are essential. Ensuring that teachers and programs are providing the CASE curricula as designed is one measure of consistency for CASE learning goals across programs.

Programs that follow the CASE certification process and meet the certification requirements will provide their students a quality education and the maximum recognition for their efforts. Students may be awarded college credit based upon meeting the certification requirements and as the program develops it is foreseeable that CASE certification will influence student admission and scholarship potential for higher education.

## The Three Domains of CASE Certification



Criteria for CASE Certification by Domain		
Student Certification	Teacher Certification	Program Certification
<ul style="list-style-type: none"> <li>• Students receive instruction by a certified CASE Instructor in a certified CASE Program</li> <li>• Students successfully complete the minimum number of core CASE courses required for a CASE Program of Study<sup>1</sup></li> <li>• Students achieve a “B” letter grade or higher on CASE End-of-Course and National Assessment Exams<sup>2</sup></li> </ul>	<ul style="list-style-type: none"> <li>• Teachers successfully complete 80 hours of professional development<sup>3</sup> lead by CASE Master<sup>4</sup> and Lead Teachers<sup>5</sup> for each CASE course offered</li> <li>• Teachers and schools allow CASE personnel to visit their classroom to monitor curricula delivery and student learning</li> </ul>	<ul style="list-style-type: none"> <li>• Schools offer a sequence of CASE courses instructed by a CASE certified teacher</li> <li>• Schools provide all required supplies and equipment for the instruction of CASE courses as prescribed</li> <li>• Schools participate in the CASE End-of-Course and National Assessment Exams</li> <li>• Schools offer a CASE certificate to students who successfully complete a CASE Program of Study</li> </ul>

<sup>1</sup> CASE Program of Study refers to a sequence of CASE courses accepted for meeting the content required for sufficient understanding of National Agricultural Science Content Standards. CASE identifies the minimum requirements for a Program of Study.

<sup>2</sup> CASE National Assessment Exams are exit exams for students who are completers of a CASE Program of Study. The exams are administered by CASE.

<sup>3</sup> Each CASE certified teacher must receive professional development specifically designed for each CASE course. The 80 hours of professional development is offered during CASE Institutes.

<sup>4</sup> CASE Master Teachers are teacher trainers who have attended a CASE Institute for a specific course, provided instruction to secondary students in that course for at least two years, and conducted a CASE Institute as a Lead Teacher for at least one year.

<sup>5</sup> CASE Lead Teachers are teacher trainers who have attended a CASE Institute for a specific course, provided instruction to secondary students in that course for at least one year, and attended a Lead Teacher Orientation Session prior to teaching their first CASE Institute.