ENTOMOLOGY
3 or 4 Member Team

I. PURPOSE

The insect contest introduces high school students to the fundamentals of entomology and develops skills in identification of common insects and their relatives using taxonomy and nomenclature used by practitioners in the industry and in the scientific community. Understanding insects and key species is of utmost importance to agricultural crops and animal production, conservation, human and companion animal health and well-being. The basic entomological principles to be covered include: 1) insect structure and function, 2) metamorphosis, 3) insect identification, and 4) importance to people. The event is supported by curriculum of the following agriculture food and natural resource coursework: Principles of Agriculture, Food, and Natural Resources, Livestock Production, Small Animal Mgt., Equine Science, Advanced Animal Science, Landscape Design, Turf Grass Mgt., Horticultural Sciences, Advanced Plant and Soil Science, Practicums in Agriculture, Food, and Natural Resources, Applied Entomology, and Veterinary Medical Applications.

A. Insect Structure and Function

To identify insects and understand their role in the environment, one must be acquainted with basic anatomy. Important features include types of mouthparts (chewing, piercing-sucking, siphoning, cutting lapping, sponging, etc.), types of legs (jumping, grasping, digging, swimming, running, etc.) and various modifications of wings, antennae, and other body parts. Anatomical features are useful in identifying habitat and food source. For example, we know that the praying mantis is an excellent predator because its front legs are modified to grasp prey and because it has chewing mouthparts.

B. Metamorphosis

All insects undergo metamorphosis, a change in body form, as they develop from egg to adult. Some insects undergo more complex changes than others, and consequently, identification of certain insects can be confused by the dissimilarity between immature and adult stages. The caterpillar and butterfly are common examples. In general, insect metamorphosis can be categorized into one of three types. Students should know to what metamorphic type each insect order belongs.

1. Ametabolous - no metamorphosis (immature stages and adults are similar: wingless as adults)
2. Hemimetabolous – incomplete or gradual metamorphosis (immature stages resemble adults but without wings and wing buds.)
3. Holometabolous – complete metamorphosis (immature stages do not resemble adults)

C. Insect Identification

The fundamental step in insect identification is recognition of order. All insects are classified into approximately 31 groups called orders. Each insect order shares a set of characteristic biological and anatomical features. Proper interpretation of mouthparts, wings, etc. aid in order recognition. Entomology students should be able to identify and differentiate between insects and a variety of other arthropods.

D. Significance to People

The significance of any insect to people in agriculture, medicine, etc. isof great practical importance. Most insects are not harmful; in fact, many are considered beneficial. For this reason, people should know the difference between pest insects and beneficial insects. Also, someinsects cannot be classified as either pest or beneficial. These insects are neutral or variable as far as people are concerned. Failure to discriminate among these insects can lead to serious economic lossesand other problems.

II. TEAM MAKE UP

Three or four individuals per school form a team. All members will be scoredand the top three scores will count toward the team total.

III. Equipment

~~A. Magnifying glasses, materials or any other items used to assist in Identification are prohibited. Contest provider will supply identification tools when necessary. When magnifying glasses are needed, contest providers will provide a magnifying glass for each specimen.~~

A. Simple magnifying glasses or hand lenses are permitted to be carried by contestants for assistance in identification when necessary

B. Team members must provide their own compliant clipboard and/or clean folder with the following items: scan sheet, and/or copy of the scan sheet, optional Texas FFA CDE drop sheet, and/or 2 sheets of lined or unlined blank paper.

IV. Event Format

~~A. The event will consist of 25 unlabeled, preserved specimens selected from a list of 150.~~ A. The event will consist of 25 unlabeled, preserved specimens selected from a list of 155.

B. The student contestants will identify for each specimen**,** the order, common name, metamorphic type, mouthpart type, and significance to people.

C. Each student will be given 90 seconds per specimen. At the end, when contestants have examined all specimens, additional time may be given to complete the scan sheets following identificationof the insects.

~~D.~~ 25 multiple choice questions with each question worth 2 pts each willbe

selected from a bank of questions from the Texas FFA website. Each student will complete a 25 question multiple choice examination from information located on pages 1-39 of *Photographic Atlas of Entomology & Guide to Insect Identification* (7th, 2000) by James L. Castner. Questions will be 2 points each. Chapters in this section of the reference material will cover the following: · Dichotomous Keys
· External Anatomy of Insects
· Insect Development
· Taxonomic Terminology
· Taxonomy, Classification, and Nomenclature

V. SCORING

Order	2 points/specimen
Common Name	3 points/specimen
Metamorphosis	1 point/specimen
Type of Mouthparts	1 point/specimen
Significance to People	1 point/specimen
Exam	2 points each
TOTAL INDIVIDUAL POINTS	250 POINTS
TOTAL TEAM POINTS	750 POINTS

VI. TIEBREAKERS

Team and individual ties will be broken using the following tiebreakers:

A. High score on orders
B. If still tied, high score on common names.
C. If still tied, high score on metamorphosis
D. If still tied, high score on mouthparts
E. If still tied, high score on written exam.
F. If still tied, the highest alternate score
G. If still tied, team/individual will be accompanied by their advisor and will meet with contest officials who will conduct a coin toss to determine the higher placing individual.

VII. RESOURCES

ENTOMOLOGY ID AND ORDER LIST CAN BE FOUND ON JUDGINGCARD AT THIS LINK: www.judgingcard.com/resources/List.aspx

Each team should acquire a study list of 150 arthropods and their characteristics upon which the event will be based. Extensive entomological literature is available in school and public libraries. Field guides to the insects are particularly useful. Many insect images are also available on a variety of websites. Each local agricultural science and technology department should consider building their own insect reference collection. Collecting insects for study is an enjoyable activity and collections may be preserved for future instructional and chapter activities. Instructions for collecting and preserving insects are available in most entomological textbooks. The collegiate entomology faculty recommends the

following text as the standard for insect biology and identification: Triplehorn, C.A. and N.E. Johnson. 2005. Borror and DeLong's Introduction to the Study of Insects, 7th edition; Thomson Learning, Inc., Belmont, CA