

4-H ENTOMOLOGY CONTEST

This contest is open to all 4-H members. A participant may enter as an individual, team member or be considered as both. There is no limit to the number of teams and/or individuals that a county may enter.

This contest has a Junior division and a Senior division. Juniors are members who have not reached their 14th birthday before January 1 of the current calendar year. A Junior member may compete as a member of a Senior team, but a Senior may not compete on a Junior division team. Junior and Senior teams will consist of 3 or 4 members with the three highest scores being retained for scoring purposes.

Participants will be asked to identify, key-out, or provide basic information about 25 injurious or beneficial arthropods that have economic importance in Oklahoma. A study list, which includes all the information that may be asked of a participant, is available on online at: <http://entopl.okstate.edu/4H-FFA/ppt/guides.html>.

The entomology contest will be divided into two parts:

1. The first part will be spot identification of insects or other arthropods using the list of species given in the handbook. Contestants will be expected to know the insects, their scientific order or family names, their food, and their ordinal characteristics as given in the list.
2. The second part of the contest will be identification using pictorial keys. The students will be graded on their ability to use the keys and are not expected to memorize them. Necessary keys will be supplied to the contestants, but each will be expected to furnish their own hand lens (preferably at least of 10x magnification). Copies of the pictorial field keys for classroom study can be obtained through the Oklahoma State University Cooperative Extension factsheet website: <http://pods.dasnr.okstate.edu/docushare/dsweb/View/Collection-257>. A list of field keys and other reference material is provided at the end of this guide.

4-H ENTOMOLOGY CONTEST

I. PURPOSE

The insect contest introduces 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.

II. OBJECTIVES

The objectives of the contest are: 1) teach participants the basics of identifying insects, 2) understand insect classification/taxonomy, 3) understand insects' role in the environment, 4) understand different types of metamorphosis insects undergo, and 5) identify insects utilizing an identification key.

III. EVENT RULES

- a. No talking, comparing, or copying of cards
- b. Decisions of the judges will be FINAL.
- c. The high three scores will be considered as the official team score.

IV. EVENT FORMAT

A. Team Make-Up

1. Three or four members will constitute a team.
2. Schools not entering a team may enter one or two students as individuals.

B. Equipment

1. Pencil or writing utensil – required
2. Clipboard – recommended
3. Hand lens (at least 10x magnification) – recommended
4. Test sheet – provided
5. Answers card – provided
6. Identification keys – provided

C. Length

25 questions.

1 min per station; 3 minutes at end of contest to go back to review 3 stations.

D. Contest

1. Read the numbered question card at the station.
2. Find the correct answer on your laminated answers card.
3. Write corresponding **NUMBER** from your answers card on your test sheet.
4. Move to the station with the next highest number when instructed. (Station 25 will proceed to station 1.)

Section I (36 points)

There are 12 stations. Each station is worth three points. Two points are for the common name (species or family group) and one point is for food. Read the question card carefully.

Section II (40 points)

There are eight stations. Each station is worth five points. You are to name the scientific order name, scientific suborder name, family name. Read the question card carefully to see which is required.

Section III (15 points)

There are three stations. Each station is worth five points. Participants will use the identification keys to key out specimens.

Section IV (6 points)

There is only one station worth six points. Participants will provide three ordinal (of the order) characteristics of the specimen. Each characteristic is worth two points. Read the question card carefully.

Section V (3 points)

There is only one station worth three points. Participants will give the scientific order name, common name, and food the specimen eats. Each is worth one point for a total of three points. Read the question card carefully.

V. SCORING

Section I	36
Section II.....	40
Section III.....	15
Section IV.....	6
Section V.....	3

Total Points

Individual..... 100

Team 300

VI. TIEBREAKERS

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

- A. Spelling on orders
- B. If still tied, spelling on families
- C. If still tied, spelling on common names

VII. SUPPLEMENTAL MATERIALS

Entomology Handbook:

[http://entopl.okstate.edu/4H-FFA/ppt/Ento-contest-v2010 and later.pdf](http://entopl.okstate.edu/4H-FFA/ppt/Ento-contest-v2010%20and%20later.pdf)

PowerPoint of all insects on the contest list:

<http://entopl.okstate.edu/4H-FFA/ppt/guides.html>

Nebraska Extension. (n.d.). "Entomology." Lincoln, NE: University of Nebraska. (\$7.95 through <https://marketplace.unl.edu/ne4h/entomology.html>)

Kaufman, Kenn & Eaton, Eric R. (2007). "Field Guide to Insects of North America." New York, NY: Houghtland Mifflin Company.

WAYS TO PREPARE FOR THE 4-H ENTOMOLOGY CONTEST

- Utilize the Entomology Handbook on the Dept EPP website:
[http://entopl.okstate.edu/4H-FFA/ppt/Ento-contest-v2010 and later.pdf](http://entopl.okstate.edu/4H-FFA/ppt/Ento-contest-v2010%20and%20later.pdf)
- Utilize the PowerPoint of all insects on the contest list:
<http://entopl.okstate.edu/4H-FFA/ppt/guides.html>
- Email andrine@okstate.edu and ask for an alternate PowerPoint version of the insect list Dr. Shufran made.
- Take the list of contest insects and create your own PowerPoint or Word document in a way that makes the best sense of the information to you.
- Make flashcards of each contest insect; image, order name, common name, family name, food. Make order flashcards with characteristics of the orders (ordinal).
- Go out and collect insects and see if you can figure out what order, family, or common name they are. Use a Kaufman Field Guide to check and see if you are right.
- Quiz each other once a week from contest insect lists/flashcards you make. Person with the most correct answers wins a prize/Loser has to perform an unpleasant task. Make it fun.
- Make an appointment to come to OSU Entomology and study the specimens.

Pictorial Field Keys

These are available at the OSU factsheet website: (<http://entopl.okstate.edu/factshts.htm>).

Fact Sheets that may be useful include the following:

- EPP-7001... Common Ticks of Oklahoma and Tick-Borne Diseases
- EPP-7008... Human Lice and Scabies
- EPP-7019... External Parasites of Goats
- EPP-7079... Biology and Control of the Pecan Weevil in Oklahoma
- EPP-7150... Alfalfa Forage Insect Control
- EPP-7156... Field Key to Larvae in Soybeans
- EPP-7157... Field Key to Larvae in Sorghums
- EPP-7158... Field Key to Larvae in Peanuts
- EPP-7159... Field Key to Larvae in Alfalfa
- EPP-7160... Field Key to Larvae in Corn
- EPP-7161... Field Key to Larvae in Cotton
- EPP-7163... Field Key to Larvae in Pecans
- EPP-7164... Field Key to Beetles in Pines
- EPP-7167... Soybean Insect Survey and Control
- EPP-7168... Plant Galls Caused by Insects
- EPP-7174... Peanut Insect Control in Oklahoma
- EPP-7176... Insects on Small Grain and Their Control
- EPP-7184... Alfalfa Aphids in Oklahoma
- EPP-7196... Grasshopper Management in Rangeland, Pastures, and Crops
- EPP-7301... Spiders: Brown Recluse, Black Widow, and Other Common Spiders
- EPP-7303... Scorpions
- EPP-7305... Paper Wasps, Yellowjackets, and Other Stinging Wasps
- EPP-7306... Ornamental and Lawn Pest Control
- EPP-7307... Beneficial Insects
- EPP-7312... Household Pest Control
- EPP-7313... Home Garden Insect Control
- EPP-7315... Shade Tree Borers
- EPP-7316... Centipedes and Millipedes
- EPP-7317... Honey Bees, Bumble Bees, Carpenter Bees, and Sweat Bees

CAREERS IN ENTOMOLOGY

Almost as diverse as this vast group of animals, entomology is a discipline with careers spanning the whole of science, the globe, agriculture, and the breadth of human talent.

Vector Entomologist: Studies insects that transmit plant pathogens. Using molecular and conventional tools, uncover barriers to bacterial transmission, work to understand how microbes work together in a community within an insect, and study insect feeding behavior. This is important to help keep high risk pathogens out of the US and to combat them more effectively once they enter and become established.

Extension Entomologist: Applies current scientific insect research on food, fiber, and home safety through advice on insect identification and pest management given to farmers, professional consultants, and extension educators. Extension practitioners can be found throughout the world, usually working for government agencies. They can perform work related to any aspect of entomology including commercial and homeowner fruit and nut trees, 4H/youth, apiculture, field crops, pastures, human health, livestock, horticulture, biosecurity, endangered species and much more.

Insect Diagnostician: Provides prompt and accurate identification of submitted insects to order, family, genus or species level. With proper identification, proper recommendations for control methods may also be provided to grower, farmers, and homeowners.

Pesticide Safety Coordinator: Manages a state-wide educational program that supports not only applicator certification, but safe and effective use of pesticides. Key pest management issues in Oklahoma include pecans, blackberry, blueberry, peach, and strawberry and research efforts include monitoring, trapping, sampling, pesticide efficacy, and developing alternatives to chemical control for insect pests to support organic growers.

Public Health Entomologist: Focuses upon insects and arthropods that impact human health. Medical entomology also includes scientific research on the behavior, ecology, and epidemiology of arthropod disease vectors, and involves a tremendous outreach to the public, including local and state officials and other stake holders in the interest of public safety.

Stored-Product Entomologist: Investigates the biology, behavior, and population dynamics of arthropod pests found in grains and other stored food products. This includes integrated pest management, sampling strategies, research into the natural enemies of these pests, and the optimization of pest/parasite/host management.

Insect Ecologist: Studies the ecology and impact of insects in Oklahoma ecosystem, including crop and natural habitats. Includes host-plant resistance on aphids in wheat and canola, insecticide efficacy, insect sampling, management of emerging arthropod pest issues around the state, plant-insect-plant pathogen interactions, and use of natural enemies (predators and parasitoids).

Insect Biochemist and Molecular Biologist: Makes contributions to the areas of insect neurochemistry, hormone and pheromone biochemistry, enzymes and metabolism, hormone and pheromone biochemistry, enzymes and metabolism, hormone action and gene regulation, gene characterization and structure, pharmacology, immunology and cell and tissue culture.

Urban and structural entomologist: Studies biology, ecology, and management of arthropod pests that are nuisances, often causing structural and economic damage to man-made structures of all types, and causing human health problems within residential and commercial environments. Urban entomologists work to manage arthropod pests that negatively impact areas within and around homes and businesses, and provide training to pest control industry personnel on the most effective, safest pest management strategies and tactics.

Insect Physiologist: work is related to Parasitology, Public Health, and Research: We have been supported by National Institutes of Health to research on immune responses in insect vectors of human diseases. By understanding their resistance against parasites, bacteria, and viruses that cause malaria, Lyme disease, and yellow fever, we are trying to block pathogen transmission in mosquitoes and other vector species. The defense mechanisms of insects and suppression/evasion tactics of pathogens are simply fascinating at the molecular level.

Biosecurity Entomologist: Investigates plant pathogens, the insects that can be intercepted at borders, or insects detected by general surveillance of field settings or within transitional facilities. Professionals in this area contribute scientific input to regulatory officials regarding plant health emergencies, risk analysis, diagnostics and more.

Forensic Entomologist: Application of insect and other arthropod biology to criminal matters. Also involves the application of the study of arthropods, including insects, arachnids, centipedes, millipedes, and crustaceans to criminal or legal cases. It is primarily associated with death investigations; however, it may also be used to detect drugs and poisons, determine the location of an incident, and find the presence and time of the infliction of wounds.

Entomology Contest Coordinator:

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