

Study Guide for Exam 1

Intro	Nothing on the exam ... you might, however, review the information on course requirements and grading ... the importance of attendance, relative contributions of quiz scores, exam scores, collection, etc.
Morphology	<p>Know what characteristics define an arthropod and what characteristics define an insect. Understand how insects "fit together" so that you can use identification keys. Know the meanings of the following terms and understand the functions of each organ or part. Know the names of key organs and their functions and the functions of each organ system.</p> <p>Terms, etc.: bilateral symmetry, exoskeleton, sclerite, cuticle, chitin, labrum, mandible, maxilla, labium, compound eye, ocellus (ocelli), antennae, prothorax, mesothorax, metathorax, pronotum, coxa, trochanter, femur, tibia, tarsus, haltere, elytron (elytra), hemelytron (hemelytra), cerci, ovipositor; and internally: foregut, midgut, hindgut, esophagus, crop, proventriculus, gastric caeca, rectum, anus, fat body, malpighian tubules, brain, ganglia, ventral nerve cord, spiracles, tracheae, rectal gills, external gills, dorsal heart, open circulatory system, ovaries, testes, spermatheca.</p>
Growth and development	<p>Understand molting and metamorphosis; the benefit of a "division of labor" between juvenile and adult stages; dormancy and survival; reproduction without mating; and nerve impulse transmission.</p> <p>Terms, etc.: ecdysone, juvenile hormone, ametamorphosis, gradual metamorphosis, incomplete metamorphosis, complete metamorphosis, juvenile, nymph, naiad, larva, pupa, adult, quiescence, diapause, parthenogenesis, axon, synapse.</p>
Behavior and reproduction	<p>Insects have organs for mechanoreception (touch, sound, and gravity), sound production, thermoregulation, and chemoreception (and chemical production). Using sound for intraspecific communication is especially important in the Orthoptera and the Cicadidae. Know the meaning of the terms semiochemical, pheromone, and kairomone. Pheromones may be used for mate attraction, trail marking, aggregation, and alarm signaling. Humans use synthetic semiochemicals for insect monitoring (pheromone traps), removal trapping, and mating disruption. Fireflies use light for attracting and recognizing mates; the length of each flash and the interval between flashes is species-specific. Most insects mate, and mated females lay fertilized eggs; in some taxa females give birth to live young without mating (also included in the previous lecture under the term parthenogenesis). Know the meaning of term polyembryony and an example of insects in which it occurs.</p>
Systematics and taxonomy	<p>Know the hierarchical sequence of classification: phylum, class, order, family, genus, and species. Know "who" the arthropod relatives of insects are ... the subphylum Chelicerata (examples include arachnids such as scorpions, spiders, mites, and ticks), the subphylum Crustacea (examples include the class Malacostraca -- the lobsters, crayfish, crabs, shrimps, and pillbugs), and other classes within the Atelocerata (the subphylum in which insects are grouped; examples include millipedes, centipedes, and symphylans).</p>

<p>Orders: Collembola through Blattaria.</p>	<p>Lecture Exam I will include questions on the Collembola, Thysanura, Ephemeroptera, Odonata, Phasmida, Orthoptera, Mantodea, and Blattaria. For each of these orders, know the scientific name of the order, what the scientific name means, the common name of the order, and the characteristics that distinguish the order. Know the type of mouthparts in the adults and the immatures, and know what type of metamorphosis occurs. For the Odonata, know the two suborders (by common name only is OK) and how to distinguish them. Terms, etc.: colophore, tenaculum, furculum, caudal filaments, subimago, abdominal gills, rectal gills, stigma, tegmina, stridulation, cerci, ootheca.</p>
<p>Orders: Isoptera through Hemiptera</p>	<p>Orders covered: Isoptera, Dermaptera, Phthiraptera (Mallophaga and Anoplura), and Hemiptera (Heteroptera and Homoptera). For each of these orders, know the scientific name of the order, what the scientific name means, the common name of the order, and the characteristics that distinguish the order. Know the type of mouthparts in the adults and the immatures, and know what type of metamorphosis occurs. Know the characteristics that distinguish termites from ants. Know the pest significance of termites and lice. Within Hemiptera, for the suborder Heteroptera: know the common names that go with the scientific names for the families Miridae and Pentatomidae. Note that the Heteroptera includes important pests and predators. Predaceous families include the Nabidae (damselfly bugs), Anthocoridae (minute pirate bugs), and Reduviidae (assassin bugs). For the suborder Homoptera: ALL members are plant feeders; know the common names that go with the scientific names for the families Aleyrodidae, Aphididae; Cicadellidae; Cicadidae, and (superfamily) Coccoidea. Know how do distinguish between the suborders Heteroptera and Homoptera. Terms, etc.: caste, epidemic typhus, hemelytra, cuneus, parthenogenesis, scale.</p>
<p>Orders: Thysanoptera through Coleoptera (and Neuroptera and Mecoptera)</p>	<p>Orders covered: Thysanoptera, Coleoptera, Neuroptera, and Mecoptera. For each of these orders, know the scientific name of the order, what the scientific name means (if relevant), the common name of the order, and the characteristics that distinguish the order. Know the type of mouthparts in the adults and the immatures, and know what type of metamorphosis occurs. For the Coleoptera: know the names of the two major suborders and how they are distinguished. Know the common names that go with the scientific names for the families Carabidae, Cerambycidae, Buprestidae, Meloidae, Scarabaeidae, Elateridae, Coccinellidae, Chrysomelidae, and Curculionidae (including the subfamily Scolytinae). Terms, etc.: thrips, fringed wings, elytra, Adephaga, Polyphaga, cantharadin, grub. For Neuroptera: know that the group that is most important economically is the Chrysopidae, the lacewings (why?).</p>
<p>Order: Hymenoptera</p>	<p>Know the scientific name of the order, what the scientific name means, the common name of the order, and the characteristics that distinguish the order. Know the type of mouthparts in the adults and the immatures, and know what type of metamorphosis occurs. Know the two main suborders (Symphyta and Apocrita), and how the larvae and adults of each are distinguished. Know one or more families that are parasitic on other insects and what the life cycle of an insect parasite is in general. Know the common names (or some common examples) that go with the scientific names for the families Formicidae, Vespidae, and Apidae. Know the organ responsible for stinging and which gender stings. Terms, etc.: insect parasitism, sawfly, horntail.</p>

<p>Orders: Trichoptera and Lepidoptera</p>	<p>Know the scientific names of these orders, what the scientific names mean, the common names of the orders, and the characteristics that distinguish each order. Know the type of mouthparts in the adults and the immatures, and know what type of metamorphosis occurs. Know the common names that go with the scientific names for the families Papilionidae, Pieridae, Nymphalidae, Sesiidae, (superfamily) Pyraloidea, Saturniidae, Sphingidae, and Noctuidae. Know the general criteria that separate moths from butterflies in everyday language. Terms: crochets, proboscis.</p>
<p>Orders: Siphonaptera and Diptera</p>	<p>For Siphonaptera and Diptera, know the scientific name of the order, what the scientific name means, the common name of the order, and the characteristics that distinguish the order. Know the type of mouthparts in the adults and the immatures, and know what type of metamorphosis occurs. For the Diptera, know what characteristics differ between the larvae and adults of the suborder Nematocera versus the suborder Brachycera. Know the common names that go with the scientific names for the families Culicidae, Tabanidae, Syrphidae, and Muscidae (no common name, but know the representative flies). Terms, etc.: halteres, mouth hooks, puparium, plague, genital combs.</p>