

### INSECT IDENTIFICATION CONTEST RULES

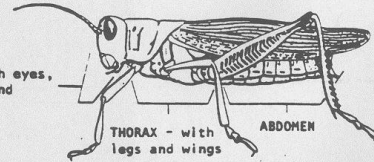
The achievement day test will be comprised of fifteen insects and a written test (10% of total exam score). The written test questions will be taken from the information provided in the handout. Elementary 4-8 members will be held responsible for all insects having one asterisk. Junior members will need to learn all insects having one and two asterisks. Senior members are responsible for all insects listed.

#### WHAT INSECTS ARE

Like their relatives (crabs, crayfish, spiders, millipedes and centipedes), insects possess a skeleton on the outside of their bodies (exoskeleton) and are cold blooded. The term cold blooded means that their temperature goes up and down with the temperature of the air around them.

However, unlike their relatives all insects possess the following three body parts: head, thorax and abdomen. The head holds the eyes, mouth parts and two antennae. The antennae or feelers serve as organs of touch, taste, smell and hearing. The thorax is the middle part with the legs and wings attached. All insects have six legs (three pairs). One pair is attached to each segment of the thorax. The abdomen is the part behind the thorax and contains the organs of digestion and reproduction.

HEAD - with eyes,  
antennae, and  
mouthparts



#### NUMBER OF INSECTS

Insects are the largest group of animals in the world. Over a million species have been identified, but authorities believe this may be only 3 percent of the insects yet to be discovered. Insects live in all parts of the world even at the Arctic circle.

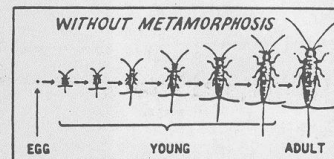
#### INSECTS AND PEOPLE

Less than one percent of insects are harmful, but these destroy about ten percent of our crops. On the other hand, many insects are beneficial. Many pollinate flowers, produce honey, aid in the process of decay, serve as a food source for larger animals and help control other insects which maintains a balance in nature. Keep this broad view in mind when people start talking about widespread insect control. Local control may be successful and useful to man, but control on a large scale might cause more harm than it would prevent, because insects are so important to most other kinds of life about us.

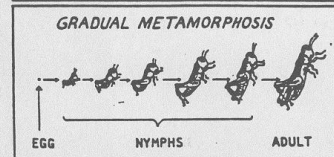
#### INSECT BIOLOGY

Where an insect lives, what it eats, what its habits are, and how it reproduces are all questions of insect biology. Most of them can be answered by a study of an insect's life cycle. The life cycle of an insect is from the egg stage to the reproducing adult. Metamorphosis is the name given to the change in shape of an insect as it grows. Insects are divided into four groups, depending upon their method of metamorphosis: without, gradual, incomplete and complete metamorphosis.

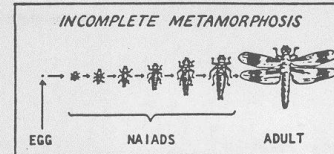
In group one the insect that comes from the egg looks exactly like it will when grown, except that it will then be larger. Lice are members of this type of metamorphosis.



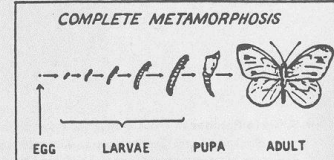
Insects in group 2 change shape gradually. There are three stages of growth: egg, nymph and adult. The following families of insects go through this type of metamorphosis: grasshopper, roaches and their kin; termites; true bugs; leafhoppers, aphids and cicadas; and earwigs.



The young insects in group 3 change shape gradually. They do not look like adults until shedding their last skin. Then there is a quick change. The following families are members of this group: dragonflies and damselflies; and stoneflies.



All insects in group 4 go through four stages of growth. None of the young look like the adult. There is a great change in shape when the adult emerges from the pupa stage. The following families of insects go through this type of metamorphosis: nerve-winged insects; beetles; scorpionflies; caddisflies; moths and butterflies; flies and their kin; and bees, wasps and ants.



# INSECT IDENTIFICATION STUDY GUIDE

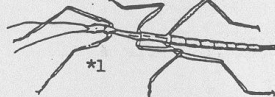
Contestants are responsible for:  
 elementary = \* insects  
 junior = \* and \*\* insects  
 senior = all insects

This key includes each insect's family description, name, and size.

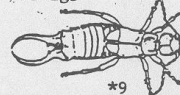
- A. Forewings leathery. Hindwings folded and fan-like (some no wings). Chewing mouthparts. Gradual development.
  1. walking stick; 3"
  2. katydid; 1"
  3. mole cricket; 1.3"
  4. field cricket; 9"
  5. American cockroach; 1.4"
  6. German cockroach; 5"
  7. praying mantis; 3.0"
  8. grasshopper; 2.0"
- B. Pincher-like tail. Usually 2 pairs of short wings. Segmented antennae. Gradual development.
  9. earwig; 6"
- C. Ant-like with soft body. Some have 4 long wings. Development gradual.
  10. termites; .2"
- D. Tiny, wingless, with piercing and sucking mouthparts. Body flattened. Legs have claws to cling to mammals.
  11. hog louse; .1"
- E. Mostly 2 pairs of wings sloping at body side. Jointed beak for sucking.
  12. treehoppers; .4"
  13. leafhoppers; .3"
  14. cicada; 1.5"
  15. aphids; .2"
- F. Two pairs of wings. Forewings partly thickened. Jointed beak for sucking.
  16. stinkbug; .6"
  17. chinch bug; .2"
  18. tarnished plant bug; .3"
  19. giant water bug; 2.2"
- G. Two pairs of long, equal-sized wings. Body long and slender. Antennae short.
  20. dragonfly; 2.5"
  21. damselfly; 1.3"
- H. Two pairs of transparent, veined wings. Chewing mouthparts. Long antennae.
  22. mayfly; 1.1"
  23. stonefly; .7"
- I. Two pairs of netted, veined wings of equal size. 4 stages of development. Chewing mouthparts. Long antennae.
  24. dobsonfly; 2.2"
  25. lacewing; .6"
- J. Two pairs of slender generally spotted wings. Legs and antennae long. Beak-like chewing mouthpart.
  26. scorpionfly; .6"
- K. Long silky hairs on 2 pairs of wings. Long antennae. Mouthparts reduced.
  27. caddisfly; .9"
- L. Two pairs of scaly wings. Sucking mouthparts. Antennae knob-like or feathery.
  28. monarch butterfly; 1.3" x 4"
  29. viceroy butterfly; 1 x 2.8"
  30. cabbage butterfly; .7" x 1.8"
  31. sulphur butterfly; .8" x 2"
  32. giant swallowtail butterfly; 1" x 4.4"
  33. black swallowtail butterfly; .8" x 2.8"
  34. tomato hornworm moth; 1.6" x 3.7"
- M. Two wings. Sucking mouthparts. Small antennae. Eyes large. Second pair of wings reduced to balance organs.

35. mosquito; .6"
36. house fly; .3"
37. deer fly; .4"
38. horse fly; .9"
- N. Forewings thickened covers. Thin, folded hindwings. Chewing mouthparts. Antennae is normally short.
  39. click beetle; 1.4"
  40. firefly; .5"
  41. lady bug; .3"
  42. striped blister beetle; .7"
  43. spotted cucumber beetle; .3"
  44. may beetle; .9"
  45. dung beetle; .8"
  46. ox beetle; 1"
- O. Two pairs of thin, transparent wings. Hindwings smaller. Chewing or sucking mouthparts. Only ones with stingers.
  47. black carpenter ant; .5"
  48. fire ant; .2"
  49. mud dauber; .5"
  50. bumble bee; 1"
  51. honey bee; .5"
  52. yellow jacket; .8"
- P. Other
  53. carpet beetle; .2"
  54. clothes moth; .5"

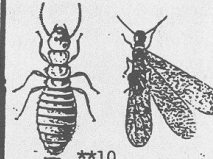
## A. Grasshoppers, Roaches, and their Kin



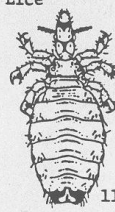
## B. Earwigs



## C. Termites



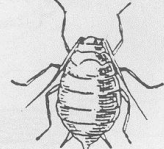
## D. Lice



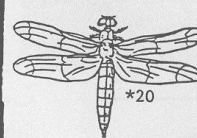
## E. Leafhoppers, Aphids, & Cicadas



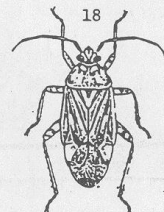
## F. True Bugs



## G. Dragonflies and Damselflies



## H. Other Insects



H. Mayflies and Stoneflies

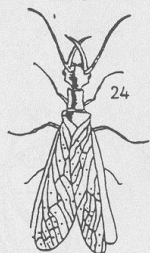


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I. Nerve-Winged Insects



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J. Scorpionflies



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K. Caddisfly

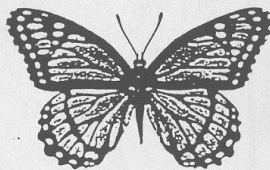


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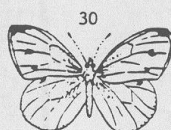
L. Moths and Butterflies



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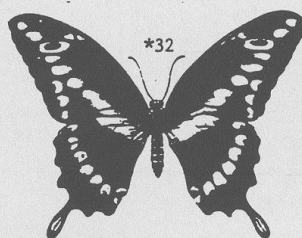
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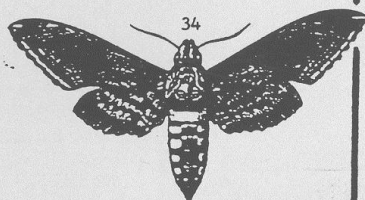
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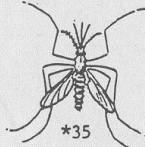


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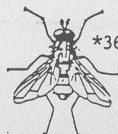


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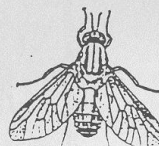
M. Flies and their Kin



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N. Beetles



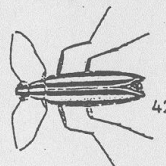
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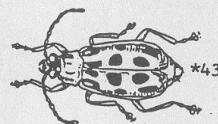
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O. Bees, wasps, & ants



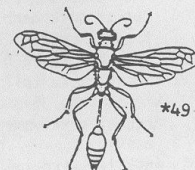
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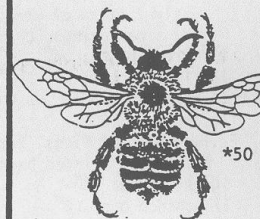
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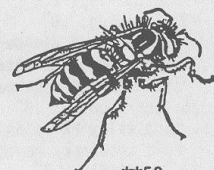
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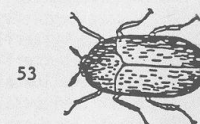
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P. Pests of cloth and Clothing



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