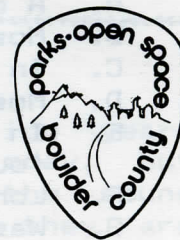


FALL
1986



Nature Detectives

"Who's been here?" "What were they doing and why were they doing it?" "When did it happen?" Nature Detectives try to answer questions like these by looking for clues and evidence of the activities of creatures in the outdoors.

Have you ever wondered about teeth marks on the trunk of a tree, or strange footprints in the snow or mud? If you have, then you are already a nature detective.

THEME:



Insects

Recipe for an Insect

Ingredients:

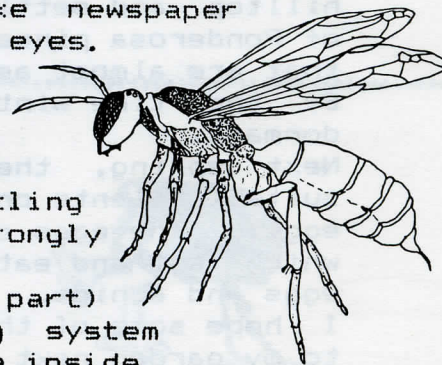
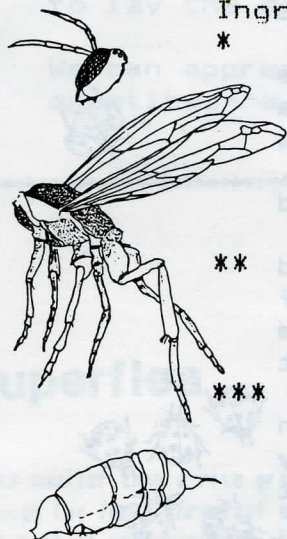
- * A head (the first body part)
Two huge compound eyes (that see the world as lots of dots like newspaper print) and several simple eyes.
Mouthparts to chew with
Two antennae to smell with

- ** A thorax (the second body part)
Six legs that can crawl and cling
Two pairs of wings to fly strongly

- *** A large abdomen (the third body part)
Breathing system, digesting system
and egg-laying system safe inside
A stinger at the end!

Join the body parts together with flexible joints.
Wrap the entire body in a segmented 'suit of armor', its exoskeleton.....

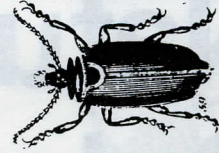
Our typical insect is a PAPER WASP.



Numbers Game

Wherever you see this sign #, choose the correct number from the second list. Answers are on last page.

- A. A dragonfly has # wing(s).
- B. Most adult insects have # antenna(e).
- C. In general, insects have # body part(s).
- D. Most adult insects have # leg(s).
- E. In the whole world, # species of insects have been found so far.
- F. Long jump champions, the fleas can jump # inch(es).
- G. Wasp, bee and fly larvae have # leg(s).
- H. Insects with complete metamorphosis have # stage(s) of life.
- J. The longest insect is the Australian stick insect, which is # inch(es) long.
- K. At # species, true beetles (Coleoptera) outnumber all the other kinds of insects.
- L. A female housefly lays about # egg(s) during her few months of life.
- M. A bee can sting # time(s).



1
4
700,000
1000



2
10
13
280,000

6
3
4
0

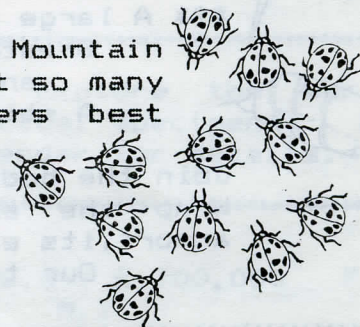
Ladybug fly away home

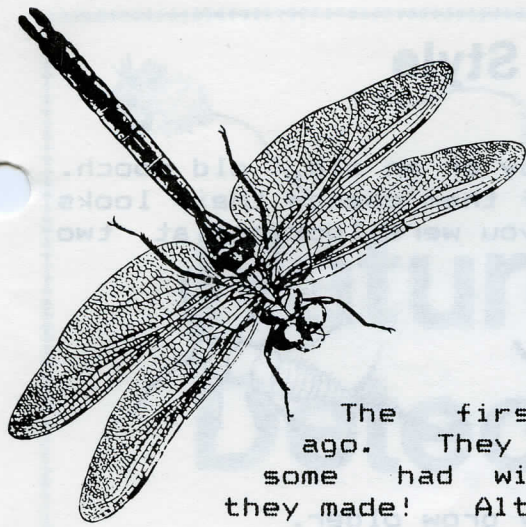
Green Mountain (near the Flatirons) is a very special place, because ladybugs gather there to spend the winter.

As summer ends, masses of ladybugs swarm up to the hilltop and settle by the thousands on the trunks of Ponderosa pines, on bushes, and on the rocks that are almost as red as the ladybugs themselves. By the time winter comes, they are settled and dormant.

Next spring, they warm up and fly off to find suitable plants on which to lay their thousands of eggs. The eggs quickly hatch into bristly larvae which eat and eat and eat. They relish insect eggs and aphids.

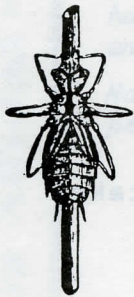
I hope some of them fly down from Green Mountain to my garden next spring; their larvae eat so many pest insects that they are a gardeners best friends!





Dragonflies

The first dragonflies lived over 300 million years ago. They looked a lot like dragonflies do today, but some had wings measuring 30 inches! Imagine the sound they made! Although dragonflies are smaller now, they are strong, swift fliers. The front wings move up while the rear wings move down--primitive, but fast--up to 25 miles per hour!



Dragonflies spend at least one winter in water as nymphs and maybe longer if the water is very cold or there is little food. In spring the nymph crawls out of the pond onto stems of plants. The exoskeleton splits, and the adult crawls out. The unfolded wings spread and strengthen with drying. The veins make beautiful patterns. After a few hours, the dragonfly flies off to woods, meadows, and gardens to feed on other insects especially mosquitoes. You may see them turn their heads to get a better look with their huge eyes. Dragonflies return to the pond to mate. The female flies over the water and releases the eggs on leaves or rocks just below the surface. The eggs hatch in about a week, and the nymphs begin feeding. Eager eaters they are, too! With a special grasping lower jaw, they can capture a variety of insects and even small fish.

Dragonfly behavior is fascinating to watch. The males pick several perches in an area of the pond and chase other males which come into their territories. Sometimes you can hear their wings collide. Females come to the pond only briefly and mate with the strongest males just before skimming the water to lay the eggs.

We can appreciate dragonflies for their beauty, speed, and appetites--a long-term success story.

Superflea

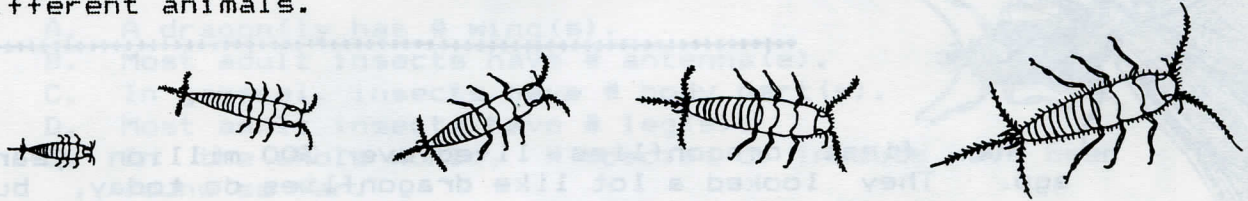


It is smaller than a rice grain. It has a narrow body, flattened from side to side so it can move through the furry forest of animal hair it calls home. And it is a superathlete!

This pest of pets can jump about six inches high, but for broad jump - WOW! - thirteen inches! That's like a man jumping five blocks. What makes this possible? A small size and light weight and an external (outside) skeleton are the important things. The legs are hollow tubes, the strongest possible shape for their weight, with many muscles that don't get tired very easily. That's what makes superflea. The reason superflea must jump is that she must hitch a ride on an animal, suck some of its blood, so that she has nourishment to lay her eggs.

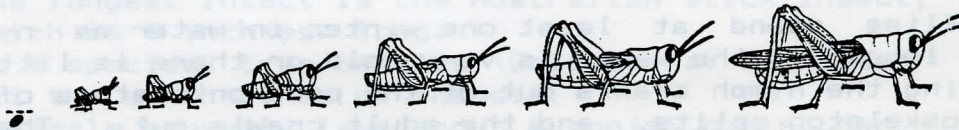
Growing up Insect Style

A dog looks like a dog, whether it is a puppy or an old, old pooch. It is not so simple with insects, for many of them change their looks so much as they grow, that you would think you were looking at two different animals.



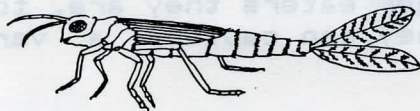
Silverfish just grow bigger as they grow older.

+++++

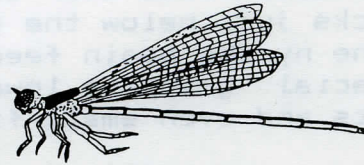


Grasshoppers are like mini-adults, except for wingbuds that take several molts to grow.

+++++



nymph



adult

Damselfly nymphs live in water, the adults in the air.

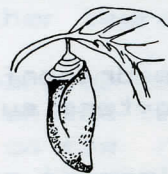
+++++



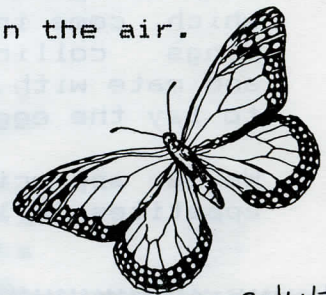
egg



larva



pupa



adult

Monarch butterfly caterpillars eat and molt but must spend time as pupae before they finally emerge to fly.

+++++

NATURE DETECTIVES: Incredible Insects: Explore the world of insects with games, puzzles, projects and actual specimens. Get to know your six-legged friends! See Images calendar for details.

Answers to Numbers Game: A.4 B.2 C.3 D.6 E.700,000 F.13
G.0 H.4 J.10 K.280,000 L.1000 M.1