Chapter 1: Some Basics

- Definitions
- Distinguish between a pesticide product and pest control device
- Explain why you need to follow the directions on the label and other labeling

Chapter 1: Some Basics

- Pest:
  Any living thing that has an undesirable impact on something that is important to us.
  - Pesticide:
    Any substance or mixture of substances used to kill pests or prevent/reduce the damage they cause.
  - Pest control devices:
    Mechanical or physical means to combat a pest

Is it a pesticide?

- Airblast fungicide application
- YES. It is a substance.

- Mouse Trap
- NO. Not a substance!

- Weed ’n’ feed
- YES. It kills weeds.

- Mosquito repellent
- YES. It repels mosquitoes.

More Basics

- Integrated Pest Management (IPM)
  Combination of all available techniques into a unified program. Goal is to manage the pest to avoid damage and minimize adverse effects.

- Use:
  application, mixing, transport, disposal

- Site:
  entity to which the pesticide is or could be applied.

Label, Labeling, Labeled

- Label:
  All the information about the product and its use. Comes printed with the product.

- Labeling:
  Label + all other information on how to use the product legally and correctly

- Labeled:
  Use is listed on and allowed by the pesticide product label

Importance of the Label!

- Provides the information you need to use the product safely and effectively
- Single most important resource!

- **The Label is the Law**
  It is against the law to violate directions listed on the label or other labeling

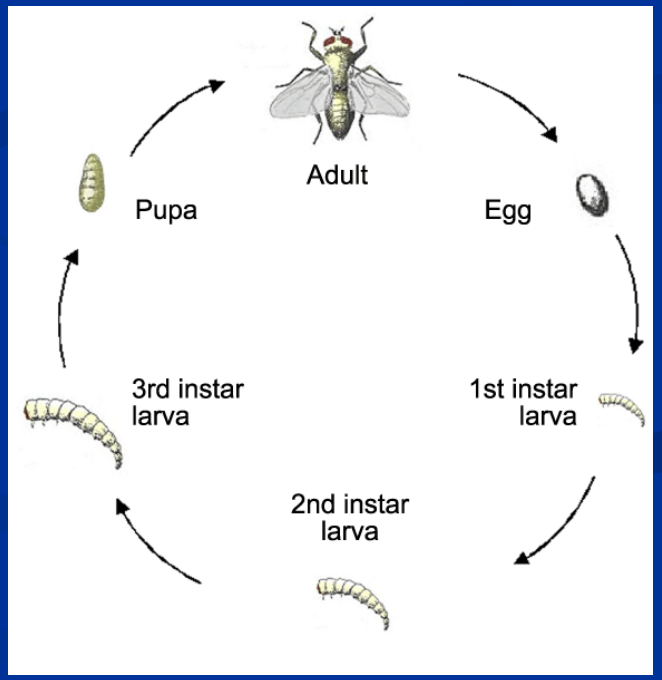
Chapter 2: Pests

- List general types of problems pests cause
- List the four basic survival needs of pests
- Give examples of pest situations arising from their search for survival needs
- Give examples of pest types in the main 4 categories
- For each type:
  - Describe physical characteristics
  - Give examples of damage
  - Describe biology & spread
- Describe different type of insect life cycles
- Tell where on the label you find which pests are controlled
- Determine whether a particular pesticide is labled for a pest-site combination
- Explain why a pesticide may be labeled for a specific use

Chapter 2: Pests

If you know the general pattern of the pest's life cycle, the damage it does, and when it does the damage, it will help you to:

- know the best time for control
- use less pesticide
- avoid injury to the host
- avoid injury to non-target areas



Pests

Any living thing that has an undesirable impact on something that is important to us.

Insects and other invertebrates	Vertebrates
Plants	Microorganisms

Types of Pest Problems

- Structural damage
- Property damage
- Food concerns
- Health risks
- Environment risks
- Reduced aesthetics
- Impaired function of things we use

Survival Needs of Pests

- Food
  - Dried food, wool, wood, glue
- Water
  - Earwigs, roots clogging tile/septic lines
- Shelter
  - Carpenter ants, cluster flies, lady beetles
- Breeding sites
  - Wasps, bats, flies in manure/garbage

The Insects

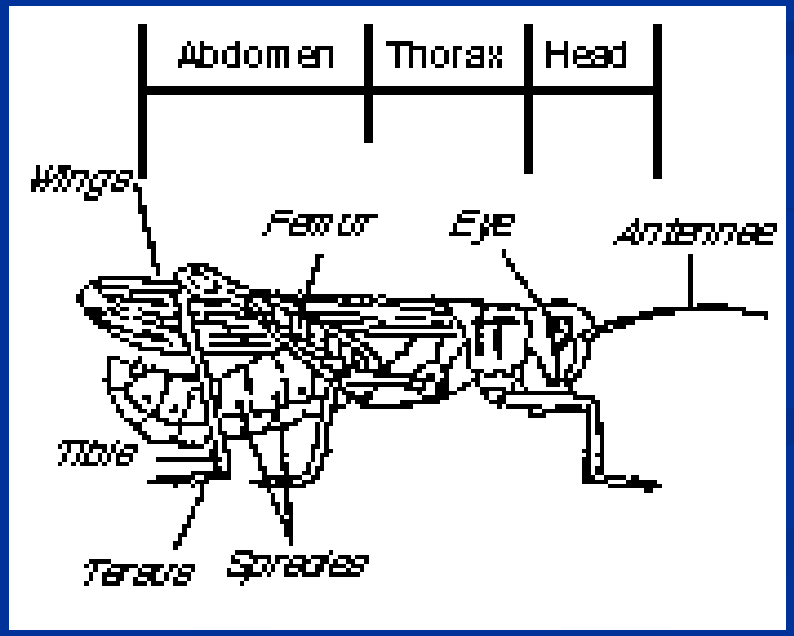
Outnumber all other animals on Earth

What % of insects are considered Pests?

1% !

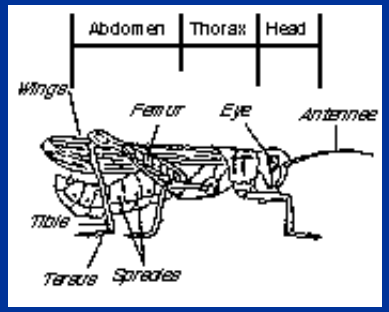
The Insects

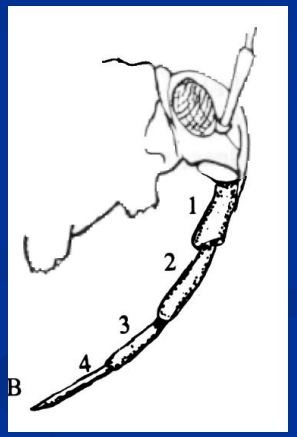
- Three pairs of jointed legs (6 legs)
- Three body parts - head, thorax, abdomen
- Covered in an “exoskeleton”

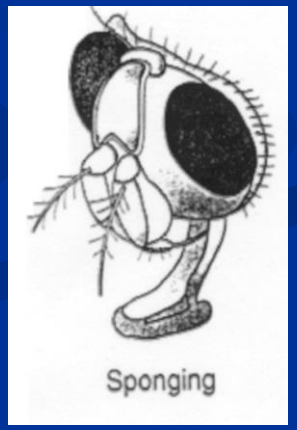


Head

- Mouthparts: important in ID
  - Chewing – bite and tear food
  - Piercing-sucking – suck out fluids/blood
  - Sponging – tongue-like, suck up liquids
  - Siphoning – long tubes (sucking nectar)
- Antennae: also important in ID
  - One pair on the head
  - Sense of smell and touch

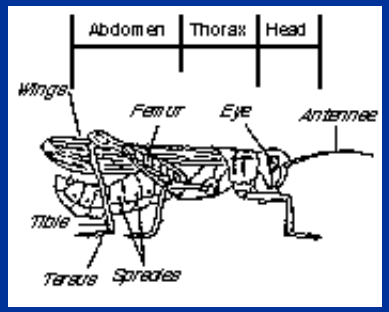






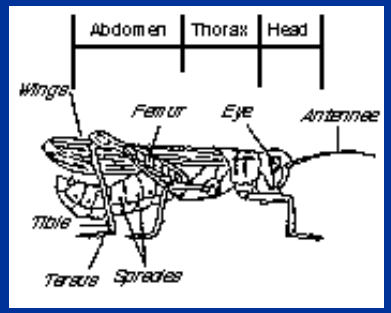
Thorax

- This middle section has three pairs of legs.
- Can be specialized – fleas, grasshoppers
- Wings: Most have two pairs, ie beetles
  - Flies have one pair
  - Some adults do not have any wings



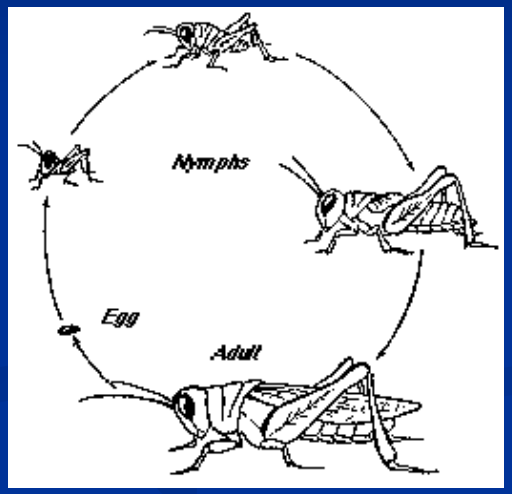
Abdomen

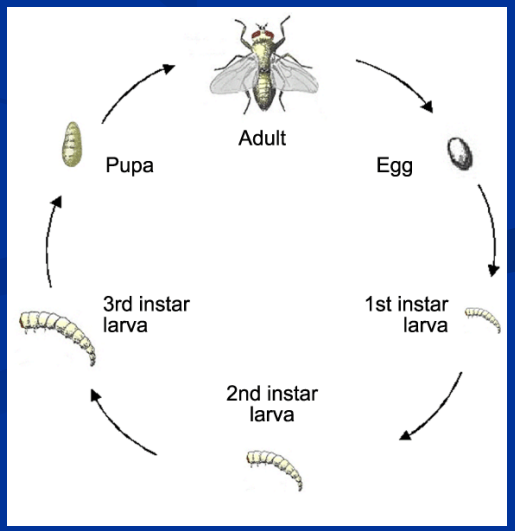
- Contains digestive and reproductive organs
- Breathe through opening on the side



Insect Metamorphosis

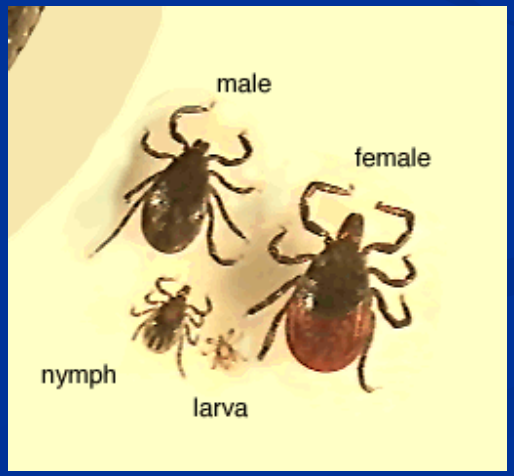
- None: no change except for size
  - Egg - young - adult , no wings
- Gradual: three stages
  - Egg – nymph (instars) – adult
  - Nymphs look like small adults
- Complete: four stages
  - Egg – larva – pupa – adult
  - Larvae do not look like adults

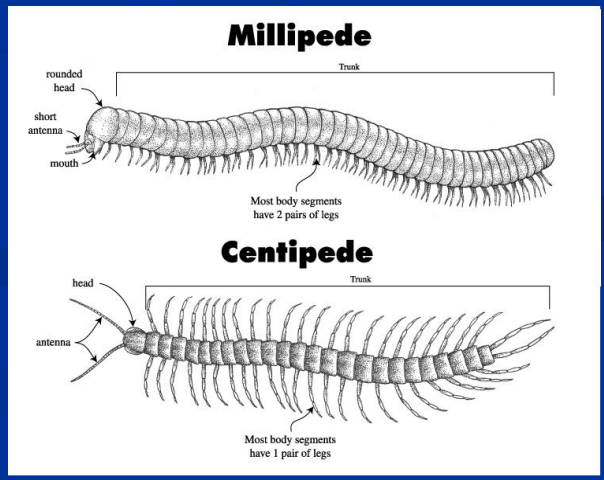




Other Invertebrates

- Arachnids – spiders, mites, and ticks
- Centipedes and millipedes
- Nematodes
- Mollusks – barnacles, zebra mussels
  - Slugs





Vertebrate Pests

- Rodents – rats and mice
  - Feed on crop plants and stored products
  - Damage property and facilities
  - Reservoir of disease
- Birds – starlings, grackles, and pigeons
  - Agricultural pest
  - Droppings

Plant Pests are Weeds

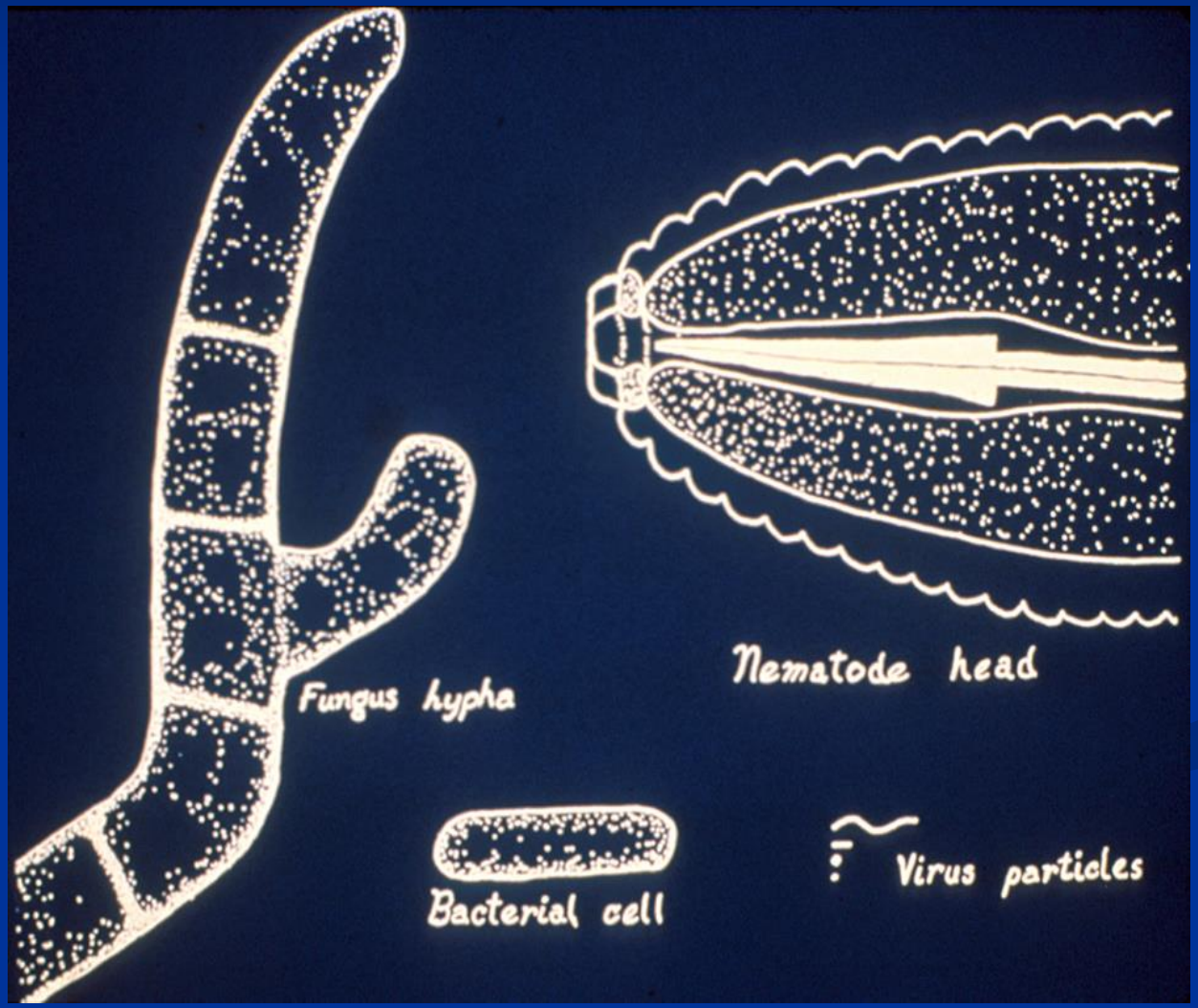
- Herbaceous weeds – no woody tissue and their topgrowth dies back each year
  - Grasses – crabgrass, foxtail
  - Broadleaves – dandelion, pigweed
- Woody weeds – woody tissue, perennial
  - Trees – sumac, black locust
  - Vines – poison ivy
- Aquatic weeds - Algae

Weed Life Cycles

- Annuals – one-year life cycle - pigweed
  - Grass and broadleaves
  - Produce lots of seeds
- Biennials – two-year life cycle
  - Vegetative in year 1, produce seed in year 2
  - Burdock, bull thistle
- Perennials – live more than two years
  - Seeds and underground structures
  - Nightshade, milkweed

Microorganisms are the Smallest Pests

- FUNGI
- BACTERIA
- VIRUSES
- NEMATODES



Plant Pathogens & Diseases

- Fungi: most common pathogen on plants
  - Molds, mildews, mushrooms
  - Can produce toxins, spread by spores, wind
- Bacteria: single-celled organisms, divide
  - Fire blight, cucumber wilt
- Viruses: Very very small
  - Recognized by plant symptoms
  - Transmitted by insects, aphids

Practice Questions:

- What is the definition of a pest?
  a. Things that are bothersome.
  b. Insects that damage crops
  c. Living things that cause damage to something we care about
  d. Something that is treated with a pesticide.

Practice Questions:

- Name the three body sections of an insect:
  a. Head, Antennae, Mouthparts
  b. Head, Abdomen, Thorax
  c. Wings, Antennae, Mouthparts

Practice Questions:

- Which of the following would be considered a 'site':
  a. A garden
  b. Lepidopteran pests of pome fruit
  c. The soil of an orchard, pre-plant
  d. B & C

Practice Questions:

- Which of the following is the documentation that is printed on or provided with a pesticide?
  a. Label
  b. Labeling
  c. Labeled