

# World of ARTHROPODS


Chapter 3 Notes – Part 3  
8<sup>th</sup> Grade Science  
Mrs. Tracy Tomm

## Section 3.18 Notes – Insects

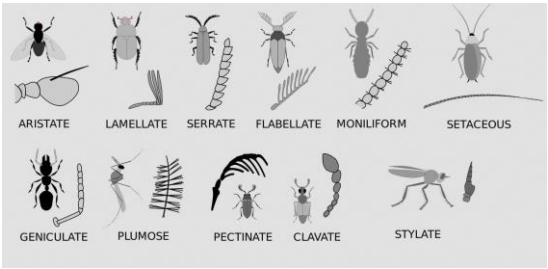
1. Complete each statement about the characteristics of insects:

-Insects have SEGMENTED bodies with an exoskeleton. The outer layer of the exoskeleton is called the CUTICLE, which is made up of 2 layers.

-What are an insect's three body segments?  
**HEAD, THORAX, & ABDOMEN**



- On which segment are the antennae found? **HEAD**




- Which segments contains most of the insect's organs? **ABDOMEN**

- To which segment are wings and legs attached? **THORAX**

- What are spiracles?

**BREATHING HOLES ON ABDOMEN USED TO TAKE IN AIR**



<http://noticing.co/wp-content/uploads/2015/10/indian-mon-moth-spiracles.jpg>

-How many pairs of legs do most adult insects have? **3 PAIRS (6 LEGS)**

★List the function of each part of an insect's anatomy:

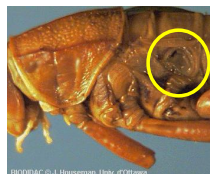
Antenna **Used as sense organs (such as "noses" for moths)**

Ocelli (Ocellus) **Simple eye used to detect light/dark**

Tympanum **Used for hearing (similar to an eardrum)**

Ovipositor **Egg-laying structure in females**

Cerci **Used as sense organs or defense (weapons)**




★What type of circulatory system do insects have? **OPEN**

*Vertebrates – Closed circulatory system (with vessels to carry blood)*

**Think About It:**

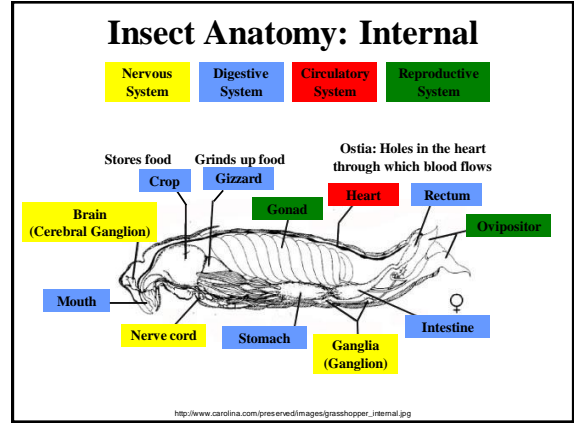
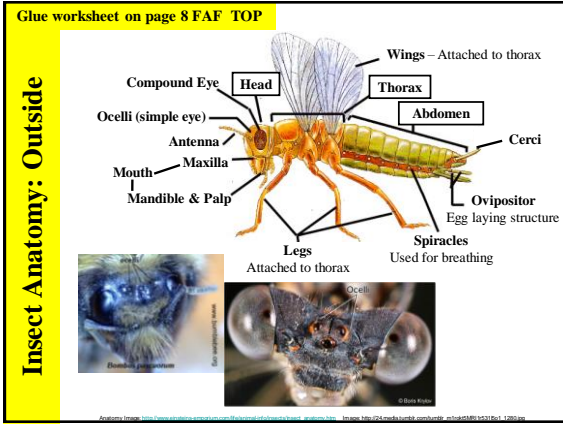
What term refers to an arthropod's blood? **HEMOLYMPH**

What color is an insect's blood? Why?  
**GREEN or YELLOW – Not red since it doesn't have the iron like vertebrates**



Mosquito

What could you infer from the mosquito picture?  
**Blood is from a vertebrate – not the mosquito! Female mosquito – needs the blood for viable eggs**



**Grasshopper Investigation**

Carefully examine the preserved specimen.

You may use the hand magnifying lenses, but do not touch them to the specimen.

Touch only with the wooden stick – not your fingers.

Do not poke the specimen or damage it in any way. We will be using these for other classes and Science Club.

**QUESTIONS TO ANSWER ...**

How many parts of the external anatomy can you find?

How many legs? Where are they attached? How would you describe them?

How many wings? Where are they attached? How would you describe them?

Where is the tympanum? What is its function?

Can you find the spiracles? How are they used?

- What are pheromones?  
**Chemicals released by animals that influence the behavior of others within the same species**
- How is bioluminescence used in fireflies?  
**Reproduction and predation - produce flashes to attract mates or prey**
- How do moths detect pheromones? **They use their feathery antennae**
- Why are bees and wasps called “social insects”?  
**They live in groups or colonies and work together for food, defense, and raising the young.**
- What does homing mean?  
**An insect can return to a single hole (nest, location, etc.) among many other apparently identical places, even after a long trip or after a long time.**

*Let's document the grasshopper ...*

*Find the chart on the back of the anatomy page!*

HOW DO THEY COMPARE?	Grasshopper vs _____	
Arthropod Class		
Body Segments (shape, size, #)		
Leg (shape, size, #)		
Mouthparts (type/description)		
Locomotion (movement)		
Other Features (Colors, defenses, appendages, etc.)		

### How do they compare?

Examine and research your team's arthropod online to compare it to the grasshopper anatomy discussed in class.

**DO NOT OPEN THE CONTAINERS!**

1. Crayfish
2. Goose neck barnacle
3. Hermit crab
4. Centipede
5. Millipede
6. Garden spider
7. Tarantula
8. Dog tick
9. Scorpion
10. Grasshopper
11. Cockroach
12. Dragonfly

HOW DO THEY COMPARE?	Grasshopper VS _____
Arthropod Class	
Body Segments (shape, size, #)	
Leg (shape, size, #)	
Mouthparts (type/description)	
Locomotion (movement)	
Other Features (Colors, defenses, appendages, etc.)	

**Assignment: Finish the chart AND the back of the notes for tomorrow!**

### Section 3.19 Notes – Insect Foods


Read pages 119-121 to answer these questions.

1. What is a proboscis used? How is it used?  
**This long mouth-tube that butterflies & moths use to suck up the nectar of the flower**
2. What is sponging?  
**Sponging means that the mouthpart can absorb liquid food and send it to the esophagus. The housefly releases saliva by dabbing the food. As the saliva dissolves the food, its sponging mouthpart absorbs the liquid food.**
3. How is siphoning used?  
**Bees use siphoning to suck liquids (nectar).**

★4. Describe the type of mouthparts each insect would likely have.

**Herbivores:** **Chewing (leaves)**  
**Sucking (sap/nectar)**

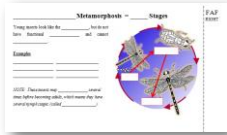
**Carnivores:** **Chewing (other insects/invertebrates)**  
**Piercing, Siphoning or Sucking (blood or insect guts)**  
**Sponging (dissolve/absorb food)**





### Section 3.20 Notes – Insect Reproduction

Read pages 122-124.

1. What do we call the physical transformation an insect makes during its life cycle? **METAMORPHOSIS**
2. What type of insects use asexual reproduction?  
**APHIDS & SCALE INSECTS**

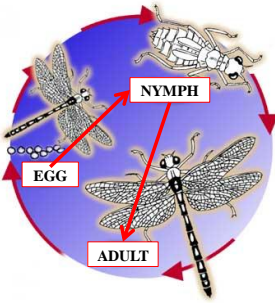



  


**Glue the metamorphosis diagram worksheet on page 8 FAF right side**

### Incomplete Metamorphosis = 3 Stages

Young insects **look** like the adults, but **do not** have functional wings and cannot reproduce.



  
 Dragonfly  
Metamorphosis

**Examples ★6?**

Dragonflies

Damselflies

Grasshoppers

Crickets

Milkweed bugs

Praying Mantids

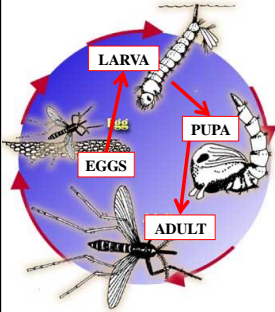
Add a water droplet  
Dragonflies and damselflies have an aquatic nymph stage.


Insects may **MOLT** several times before becoming adults, which means they have several nymph stages (called **INSTARS**).

[http://www.kidfish.bc.ca/images/damselfly\\_life\\_cycle.jpg](http://www.kidfish.bc.ca/images/damselfly_life_cycle.jpg)

### Complete Metamorphosis = 4 Stages

Young insects **do not** look like the adults, do not have wings, and cannot reproduce.



  
 Monarch  
Metamorphosis

**Examples ★6?**

Butterflies

Flies

Bees

Mosquitoes

Ants

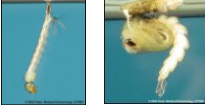
Beetles

Mosquitoes & midges have an aquatic larval and pupal stage.

These insects may have several **INSTARS** during their **LARVAL** stage as they grow.

Life Cycle: [http://www.kidfish.bc.ca/images/mosquito\\_life\\_cycle.jpg](http://www.kidfish.bc.ca/images/mosquito_life_cycle.jpg)  
 Mosquito Images: <http://www.audisonline.com/mosquito/index.htm>

**What do we call the larva & pupa stages of a mosquito?**




Larva = **Wiggler**  
Pupa = **Tumbler**

**★5. Larva Examples**  
Mosquito = wiggler  
Butterfly = caterpillar  
Beetle = grub worm  
Fly = maggot

**★5. Pupa Examples**  
Mosquito = Tumbler  
Butterfly = Chrysalis  
Moths = Cocoon  
Beetles & flies = Pupa case


**Maggots**



**What do we call the larval stage of a house fly?**

**What do we call the larval stage of a Japanese beetle?**

**Japanese Beetle Life Stages**




**GRUB WORMS**

<http://url.um.edu.mo/press/88f2c2a9720.html>  
<http://www.abc.net.au/science/story/health/maggots100064.jpg>

**Section 3.21 Notes – Importance of Insects**

- Insects help the environment as they help **AERATE** the soil, **POLLINATE** blossoms, and **CONTROL** insect and plant pests.
- Insects also act as **DECOMPOSERS** by breaking down dead plants and animals and **FERTILIZE** the soil with the nutrients from their droppings.
- Some insects produce useful substances, such as **HONEY**, wax, lacquer, and **SILK**. Adult **INSECTS** and their **LARVAE** are used as fishing bait.
- Insects have an important role in food **CHAINS** and food **WEBS**. They are also a rich source of **MINERALS**, vitamins, and **PROTEIN**.
- Insects, such as fly larvae or **MAGGOTS**, are used to clean wounds and prevent infections.



**Why eating insects makes sense ...**



**Section 3.22 Notes – Control of Insects**

**Read pages 128-130.**

- Biological control is a method of controlling **PESTS** by using other **INSECTS** or other natural predators. Some examples are ladybugs & lacewings help to keep **APHIDS** under control and dragonflies are predators of **MOSQUITOES**.
- Parasitic insects, such as **WASPS** and flies, lay their eggs on an insect **HOST**.

<https://www.youtube.com/watch?v=MG-1WjNcAs>

- INSECTICIDES** (or pesticides) are chemicals that kill insects.
- What is one disadvantage to using chemicals?  
**Human, fish, and honeybee poisonings**  
**Contamination of meat and dairy products**  
**Costly - The U.S. spends \$9 billion each year on pesticides**