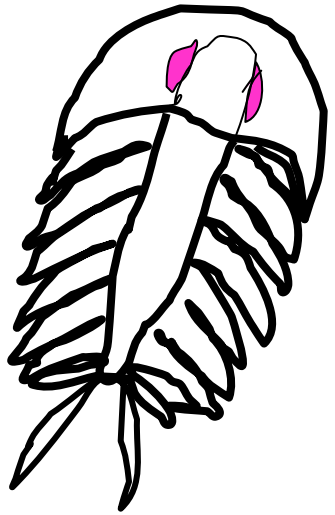
Phylum
Arthropoda

Once upon a time there lived a fossil ……..!?



4 SUBPHYLA:

1. **Trilobitmorpha**
2. **Crustacea**
3. **Chelicerata**
4. **Uniramia**

Phylum
Arthropoda

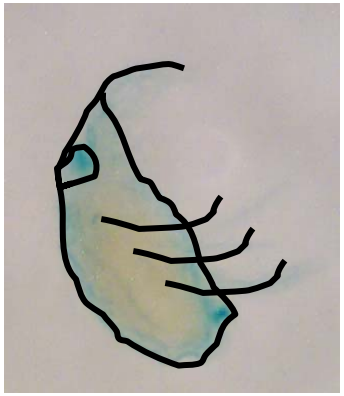
(Send your e-mails 'CC MOB') or

Subphylum 2 **Crustacea** 'B O CC M'

Class **Copepoda**
Class **Cirripedia**
Class **Malacostraca** ← (Head of the mob!)
Class **Ostracoda**
Class **Branchiopoda**

Subphylum 2

Crustacea



Class **Branchiopoda**

"Lung feet"

Fairy Shrimp

Daphnia

Class **Malacostraca**

= Largest class

4 ORDERS

Do not need to know the names of these Orders for the practical! S.A.I.D. – just that A & B are closely related.

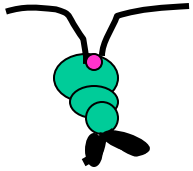
Stomatopoda
Mantis Shrimp

Amphipoda
Beach Hoppers &
Sand Fleas

Isopoda
Pill bugs
Giant Sea Roach

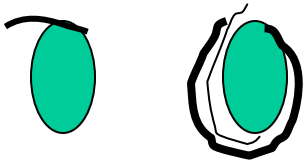
Decapoda
Crabs, Lobsters etc..

Class **Copepoda**

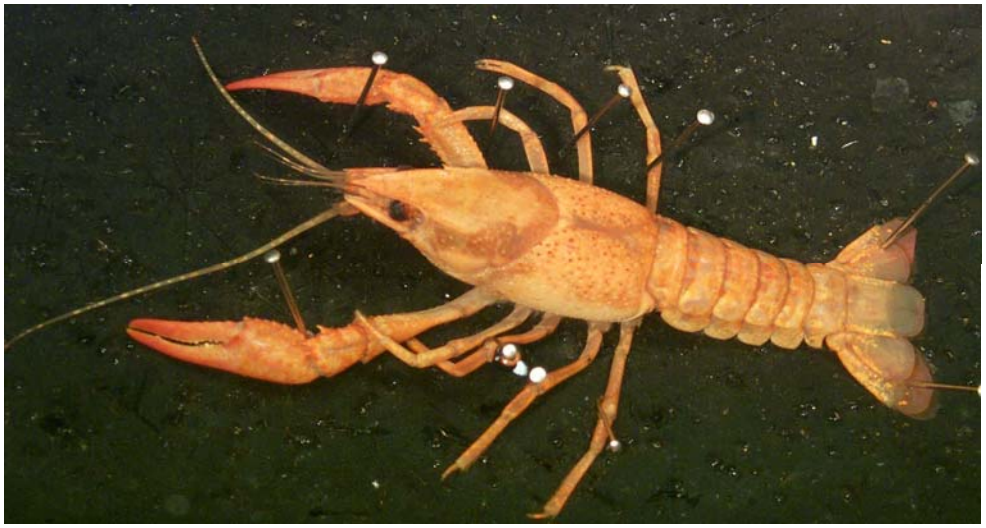


Tiny red-eyed aliens! Really weird looking

Class **Ostracoda**



Seed shrimp with bivalve-like shell



Crayfish - 1st pleopod in males = specialized intromissive organ. Absent or reduced in females.

Subphylum 2

Crustacea

Class **Malacostraca**

Order **Decapoda**

Phylum

Arthropoda

Subphylum 3

Chelicerata

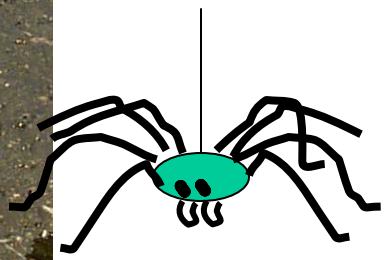
('AMP', 'PAM' or 'MAP')

Class **Pycnogonida**

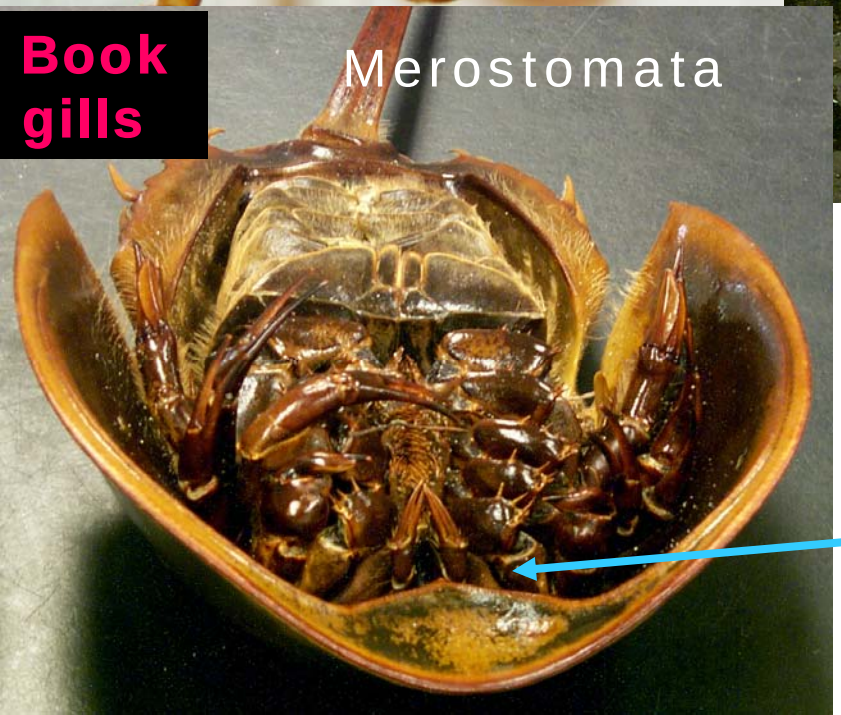
Class **Arachnida**

Class **Merostomata**

Subphylum 3
Chelicerata



Book gills



Males clasps females with 1st pedipalp (boxing gloves)

Book lungs & spiracles

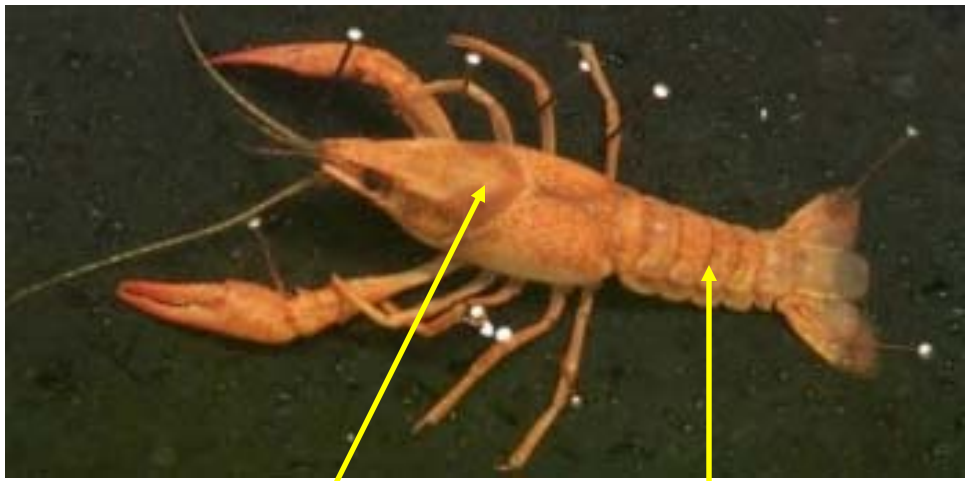
TAGMOSIS

Book lungs / B. gills & tracheal system

↘ **Chelicerata**

Prosoma & Opisthosoma

Crustacea



Cephalothorax & Abdomen

Gills only

Phylum

Arthropoda

Subphylum 4

Uniramia

‘DIC’ or ‘CID’

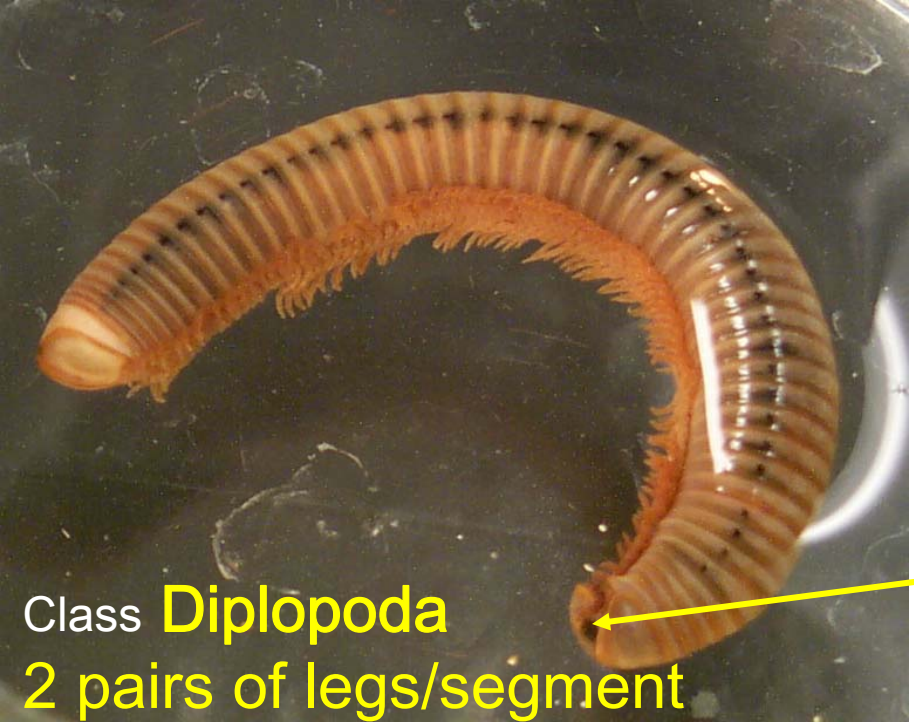
Class **Chilopoda**

Class **Diplopoda**

Class **Insecta**

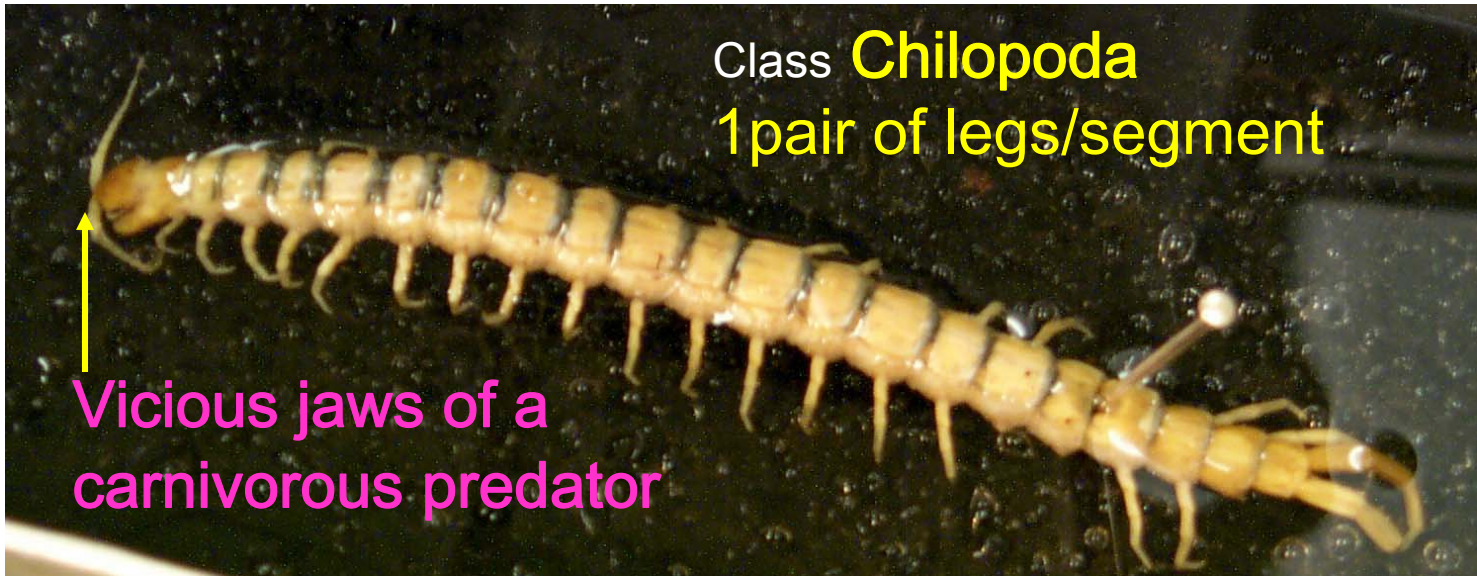
Which one has most legs per segment?

Subphylum 4
Uniramia



Class **Diplopoda**
2 pairs of legs/segment

Rounded head with no obvious jaws as it is a deposit feeder



Class **Chilopoda**
1pair of legs/segment

Vicious jaws of a carnivorous predator

Suphylum 4 **Uniramia** Class **Insecta**

The "bugs!"

Ah! The smell of mothballs!

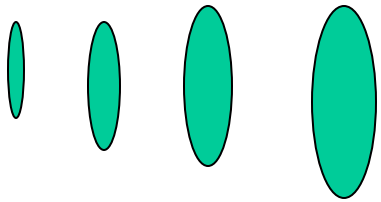
Metamorphosis

is the change

from a **LARVAL** form to..... an **ADULT** form

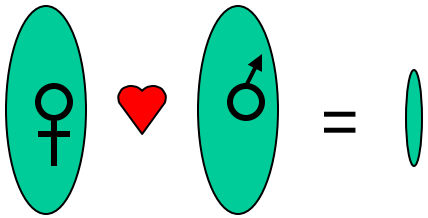
...which grows by MOLTING

..but does NOT REPRODUCE



..which does not grow (MOLT)

..but does REPRODUCE



Wings have

G T G

HOLOMETABOLISM

T T U

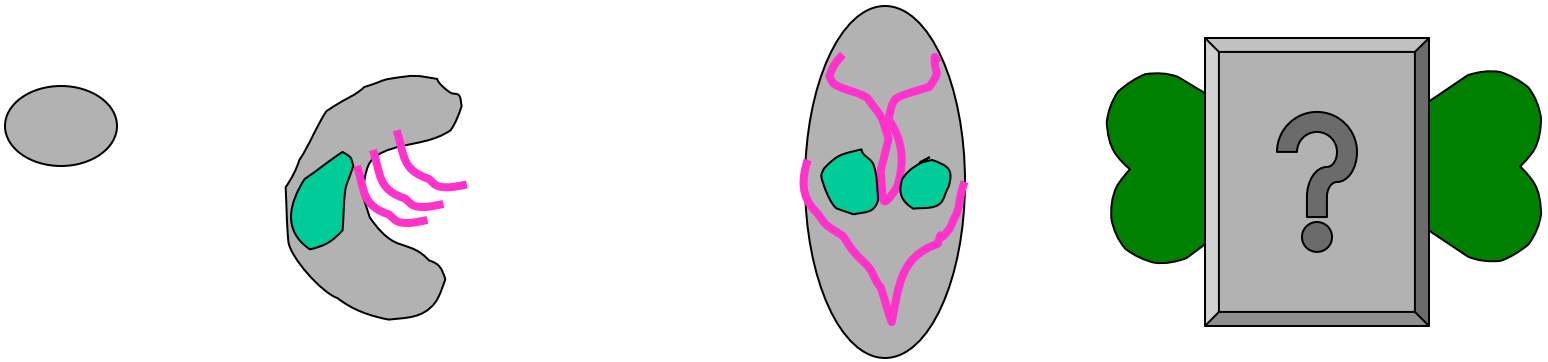
T

Holometabolism

Holometabola = Endopterygota

4 ORDERS

Egg -> larvae -> pupa -> adult



Holometabolism

4 ORDERS

-Wings on the INSIDE in the larva

and must undergo a complete metamorphosis to bring them out in the adult.

This is a VERY dramatic change

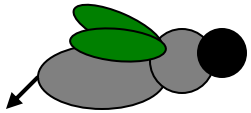
Division Endopterygota

Holometabolous Life Cycle **4 ORDERS:**

HLCD

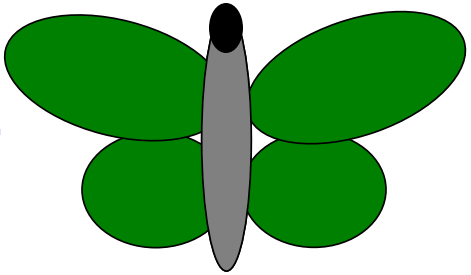
Order **Hymenoptera**

Bees, ants, wasps



Order **Lepidoptera**

Butterflies, moths

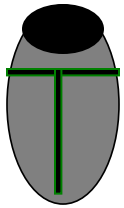


Bugs worthy of a nursery rhyme or a typical children's picture book

Order **Coleoptera**

Beetles.

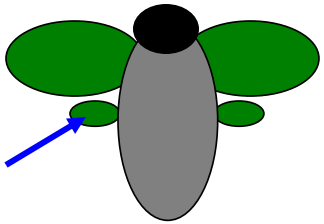
Look for "T" formed by ELYTRA



Order **Diptera**

True flies

Look for HALTERES



Hemimetabolism

5 ORDERS

- Wings on the OUTSIDE in the larva already.

Only need an incomplete/partial metamorphosis = (using half of the effort) to bring the insect to the mature adult stage.

W

HEMIMETABOLISM

N L U

G R T

S E

A

D

Y

Hemimetabolism

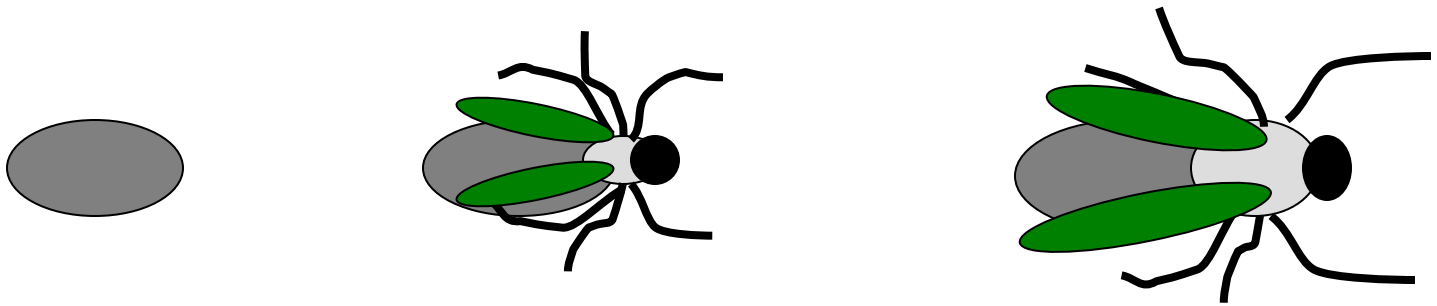
Incomplete metamorphosis Wings on the outside

Hemimetabola = Exopterygota

5 ORDERS

egg-> nymph(mini adult)-> adult

(Naiad if aquatic)

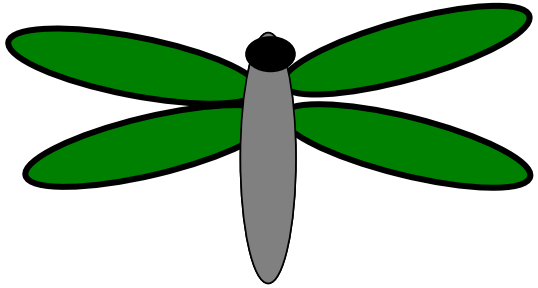


Division Exopterygota

Hemimetabolous Life Cycle **5 ORDERS:**

Order **Odonata**

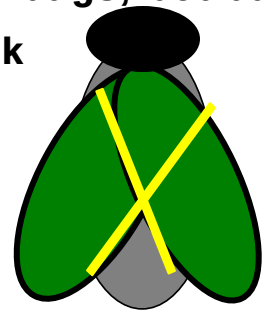
Dragonflies, damselflies



Order **Hemiptera**

Bug allies (assassin bugs, bedbugs)

Look for "X" on back formed by wings crossing over each other

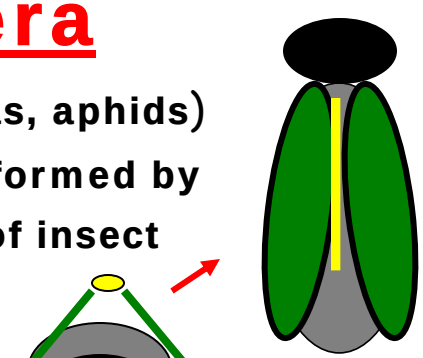


OHIO

Order **Homoptera**

True bugs (cicadas, aphids)

Look for "home" formed by wings over back of insect



Head-on

Order **Isoptera**

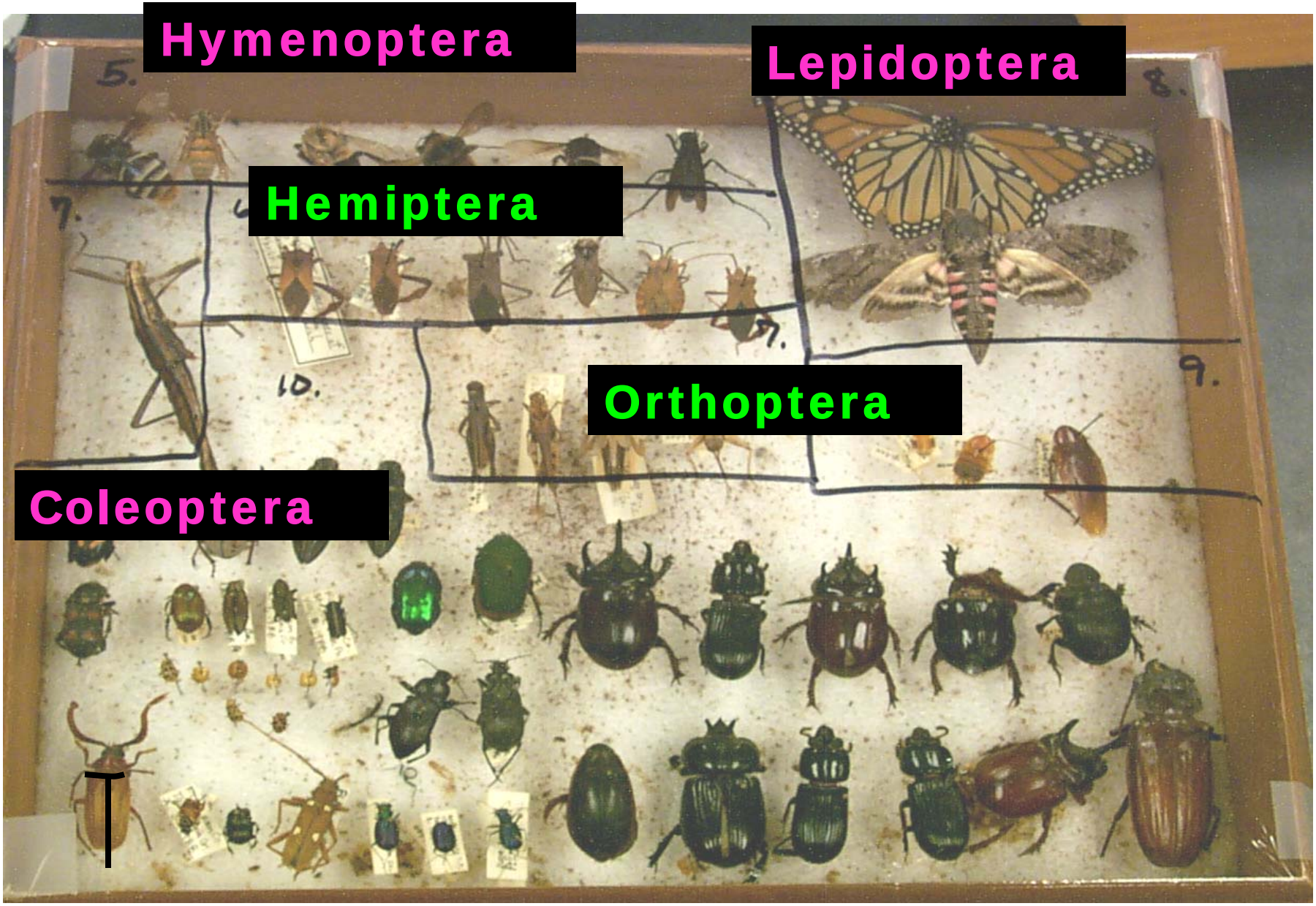
Termites

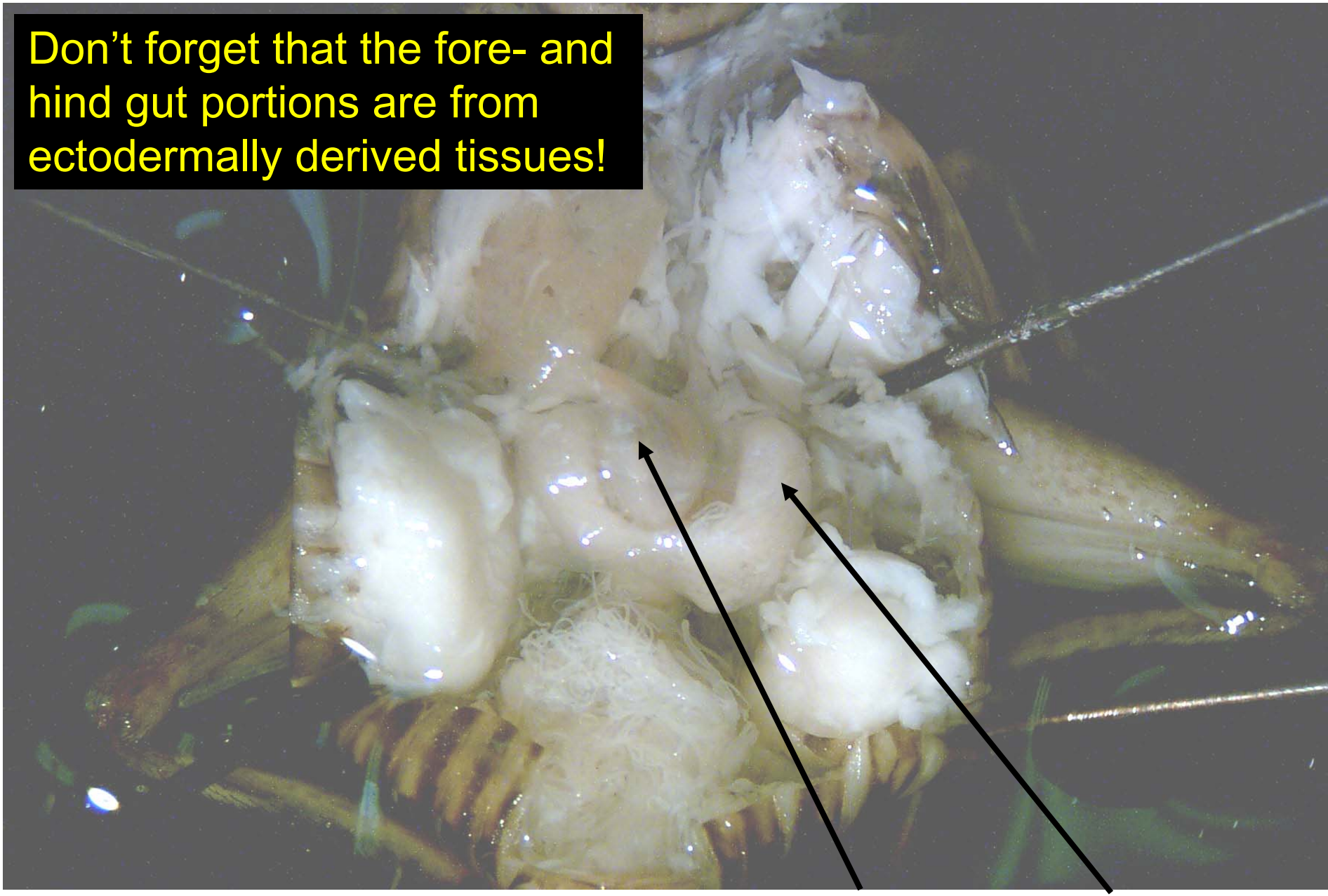
Order **Orthoptera**

Crickets, grasshoppers, roaches

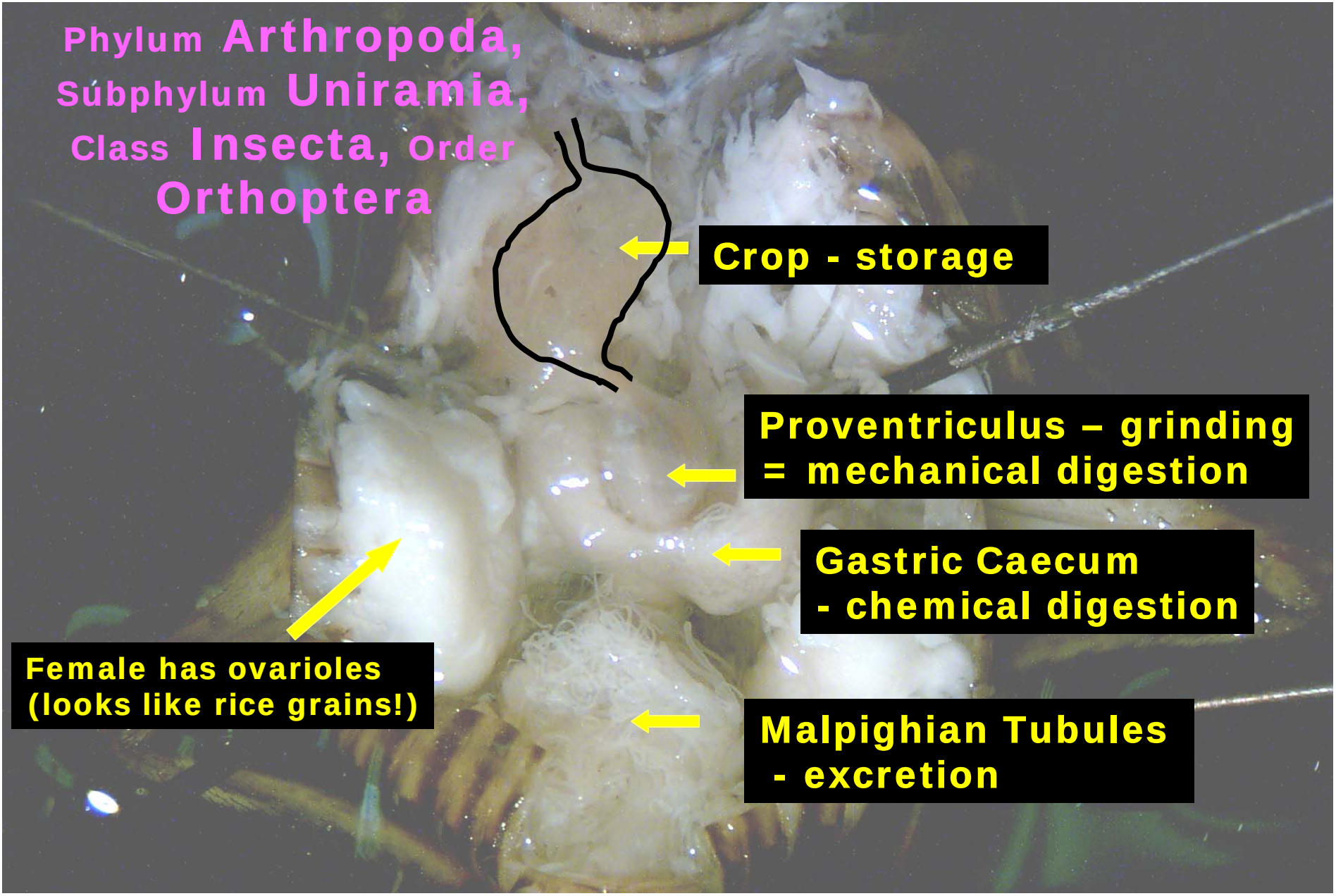
Subphylum **Uniramia** Class **Insecta**

Uniramia Class Insecta





Inside a Grasshopper… **Remember the baseball and glove?**



Respiratory system = Tracheal system (has spiracles etc.)