

**A suture is best described as:**

- A junction between two sclerites.**
- A thick ridge of cuticle.
- A point of attachment between segments.
- A membranous bridge.

**What function do quinone cross-linkages have in the exoskeleton?**

- They make it impermeable to water.
- They make membranes more flexible.
- They darken the color of the exoskeleton.
- They make the sclerites rigid.**

**An apodeme could NOT be described as:**

- A point of attachment for muscles.
- An internal ridge of the exoskeleton.
- A brace to strengthen the exoskeleton.
- A flexible joint in the exoskeleton.**

**Which structure is unicellular?**

- Spine
- Seta
- Gland**
- Sclerite

**An insect's head is specialized for:**

- Reproduction and digestion
- Ingestion and perception**
- Orientation and locomotion
- Adaptation and respiration

**Which structure is NOT part of the head capsule?**

- Pronotum**
- Clypeus
- Tentorium
- Vertex

**The frontal suture lies between:**

- The compound eyes and the gena.
- The frons and the compound eyes.
- The clypeus and the frons.
- The labrum and the clypeus.

The frons and the clypeus are separated by the:

- Epistomal suture
- Labrum
- Gena
- Subgenal suture

The clypeus is located between:

- The gena and the frons.
- The vertex and the labium.
- The frons and the labrum.
- The occiput and the gena.

The mouthparts include all of these structures EXCEPT:

- Hypopharynx
- Maxillae
- Clypeus
- Labium
- Labrum

Which mouthpart(s) lie(s) between the labrum and the maxillae?

- Tentorium
- Mandibles
- Labium
- Palps

Which structure is NOT part of an insect's antenna?

- Scape
- Flagellum
- Pedicel
- Coxa

Which part of an insect's antenna articulates with its head capsule?

- Pedicel

- Arista
- Flagellum
- Scape

The hypopharynx separates the mouth opening from the:

- Cibarium
- Labrum
- Mandibles
- Salivarium

## 5 Multiple Choice Questions

1. What is the definition of mandibles?

- A. paired; responsible for tearing or biting food
- B. immovable; above the labrum
- C. upper lip ; can be bent
- D.all of the above apply

2.What is a type of secretions?

- A. salivary Channel
- B. non - Invasive sucking of liquids
- C. toxins
- D.proboscis

3.What is an example of sponging ?

- A. mayflies
- B. termites
- C. lice
- D. housefly

4.What is an example of chewing ?

- A. mantis
- B. mosquito
- C. grasshopper
- D. both A and C

5.What is a type of liquid diet ?

- A. plant juices
- B. antistetics

C. toxins

D. enzymes

Which structure would NEVER be found on an insect's prothorax?

- Leg
- Wing
- Spiracle
- Pronotum

To which body segment are the elytra attached?

- Mesothorax
- Metathorax
- Prothorax
- First abdominal

Which structure would NOT be found on an insect's leg?

- Trochantin
- Arolium
- Coxa
- Tarsomere

Which part of the leg lies between the femur and the tarsus?

- Coxa
- Trochanter
- Arolium
- Tibia

What happens when you press down on the top of an insect's thorax?

- The wings go up.
- The wings go down.
- The wings go forward.
- The wings go backwards.

Which of these is NOT a longitudinal wing vein?

- Costa
- Radius
- Furca
- Cubitus

The furca is best described as:

- An internal brace for the legs.
- A springing organ.
- A fulcrum for the wings.
- A hinge for the neck.

The abdomen is specialized for:

- Feeding and locomotion
- Locomotion and reproduction
- Reproduction and digestion
- Digestion and ingestion

How many abdominal segments are found in a typical insect?

- Less than 5
- 6 to 11
- 12 or 13
- More than 15

The dorsal sclerite of each abdominal segment is called a:

- Sternite
- Pleurite
- Coxite
- Tergite

Which structure NEVER occurs on an abdominal segment?

- Spiracle
- Spine
- Apodeme
- Pleural suture

Junctions between abdominal segments are best described as:

- Telescoping
- Dovetailed
- Ball and socket
- Hinged

Male genitalia include all the these EXCEPT:

- Valvifer
- Clasper

- Aedeagus
- Paramere

Which abdominal structure is unpaired?

- Cercus
- Epiproct
- Valvifer
- Paraproct

Which abdominal structures are primarily sensory in function?

- Paraprocts
- Valvulae
- Cerci
- Sternites

Which structures are part of the ovipositor?

- Paraprocts
- Cerci
- Aedeagus
- Valvulae

Of the structures listed, which one lies just above the anus in a typical insect?

- Genital opening
- Paramere
- Cercus
- Epiproct

The pedicel is the name for the:

- First leg segment
- Second leg segment
- First antennal segment
- Second antennal segment

Which structure is NOT part of the female reproductive system?

- Follicle
- Accessory gland
- Spermatheca
- Bursa copulatrix

Which structure lies between the crop and the gastric caecae?

- Colon
- Pyloric valve
- Proventriculus
- Esophagus

What is the maximum number of ocelli that may be found in an adult insect?

- Zero.
- Three.
- Five.
- Twenty.

In insects with chewing mouthparts, which structure lies between the mandibles and the maxillae?

- Clypeus
- Hypopharynx
- Labium
- Labrum

What type of chemical monomer forms the backbone of a chitin molecule?

- Lipid
- Quinone
- Sugar
- Amino acid

In an abdominal segment, the ventral sclerite is known as:

- Epimeron
- Notum
- Epiproct
- Sternum

The axilla is a small pleural sclerite located just above the mesepimeron in some insects. It provides a site for attachment of direct flight muscles. On which thoracic segment would you expect to find this sclerite?

- First
- Second
- Third
- No way to tell

Which mouthparts bear palps?

- Labrum and labium

- Labium and maxillae**
- Maxillae and mandibles
- Mandibles and labrum

The ovipositor is formed by the:

- Valvifers and valvulae**
- Claspers and parameres
- Epiproct and paraprocts
- Aedeagus and subgenital plate

To which body segment are the halteres attached?

- Mesothorax
- First abdominal
- Prothorax
- Metathorax**

What structure braces the head internally and serves as a point of attachment for mandibular muscles?

- Tentorium**
- Pedicel
- Furca
- Epiproct

Which is the correct sequence for the layers in an insect's exoskeleton?

- Procuticle, epicuticle, endocuticle
- Exocuticle, cuticulin layer, endocuticle
- Wax layer, cuticulin layer, exocuticle**
- Wax layer, endocuticle, exocuticle

Which stucture would NOT be found on an insect's pretarsus?

- Trochanter**
- Claws
- Spines
- Sticky pads

In which region of the exoskeleton do quinone cross-linkages form?

- Endocuticle
- Exocuticle**
- Procuticle

- Epicuticle

The tibia lies between:

- The trochanter and the femur
- The femur and the coxa
- The coxa and the trochanter
- The tarsus and the femur**

What is the function of the furca?

- It provides a site for attachment of leg muscles.**
- It is an organ of locomotion.
- It prevents water loss.
- It is a sense organ.

Which structure is NOT found on the thorax of a grasshopper?

- Trochantin
- Tympanum**
- Spiracle
- Scutellum

What is the function of the cement layer in the insect's exoskeleton?

- It prevents water loss.
- It protects the wax layer from abrasion.**
- It acts as an insulator during molting.
- It makes the exoskeleton rigid.

An apophysis is best described as:

- An invagination of the exoskeleton**
- Part of the male genitalia
- An internal brace in the head
- Part of an insect's pretarsus

Which statement about wing veins is INCORRECT?

- Veins are laminated between a double layer of membrane.
- Veins are hollow and contain hemolymph.
- The costa is a vein that forms the wing's leading edge.
- Longitudinal veins are parallel to one another and lie in a single plane.**

What structure protects the midgut from abrasion by food particles?

- Intima

- Peritrophic membrane**
- Proventriculus**
- Pyloric valve**

Insects have a(n):

- Four-chambered heart**
- Closed circulatory system**
- Dorsal blood vessel**
- Lymphatic system**

An insect's heart is located:

- In its head.**
- In its thorax.**
- In its abdomen.**
- In more than one body region**

The heart lies along the:

- Upper side of the digestive tract.**
- Ventral side of the body.**
- Dorsal side of the body.**
- Left side of the body.**

In the circulatory system of insects:

- Capillaries are found only in the head**
- Oxygen is carried to all parts of the body**
- Blood is pumped from the abdomen to the head**
- There is a heart in each segment of the body**

An insect's heart is best described as a:

- Four-chambered muscle**
- Vibrating diaphragm**
- Rotating piston**
- Pulsating tube**

One-way flow valves in the heart are called:

- A blood sinus is best described as:**
  - An allergic reaction by an insect.**
  - A body cavity where blood moves freely.**
  - A region of the heart that collects blood.**

- A pulsating organ near the base of the wings.

Immediately after blood leaves an insect's aorta:

- It is collected in the vena cava.
- It goes into the wings.
- It enters the ostia.
- It flows over the brain.

Which of these do NOT circulate in the blood of an insect?

- Molting hormones
- Antibodies
- Nutrients
- Nitrogenous waste products

The blood cells of most insects:

- Contain hemoglobin
- Secrete platelets for clotting
- Carry oxygen and carbon dioxide
- Immobilize foreign bodies by encapsulation

Which structure collects and excretes uric acid?

- Malpighian tubule
- Rectal pad
- Accessory gland
- Proventriculus

Most enzymatic digestion occurs in the:

- Midgut
- Gastric caecae
- Proventriculus
- Crop

Which structure is INCORRECTLY paired with its function?

- Crop -- storage
- Proventriculus -- secretion of enzymes
- Malpighian tubules -- excretion
- Mesenteron -- digestion

Which part of the digestive system prevents excessive water loss in terrestrial insects?

- Proventriculus.**
- Gastric caecae.**
- Rectal pads.**
- Accessory glands.**

Which structure would probably NOT be found in an insect that has a continuous supply of food?

- Gastric caecae**
- Malpighian tubules**
- Intima**
- Crop.**

Which structure would probably NOT be present in an insect that feeds exclusively on blood?

- Crop**
- Proventriculus**
- Gastric caecae**
- Rectum**

What is the principle energy source for most insects?

- Proteins**
- Cellulose**
- Carbohydrates**
- Vitamins**

Which of these compounds must be present in the diet of most insects?

- Cellulose**
- Fat soluble vitamins**
- Honeydew**
- Cholesterol**

Which of these is found ONLY in the male reproductive system?

- Seminal vesicle**
- Accessory gland**
- Spermathecal gland**
- Primary germ cells**

Each ovariole contains:

- A single follicle.**

- Many primary oocytes.
- More than one developing egg.
- Stored sperm for selective reproduction.

In male insects, sperm is stored in the

- Spermatheca
- Accessory glands
- Seminal vesicles
- Bursa copulatrix

After an egg leaves the ovary, it passes through the:

- Accessory gland
- Seminal vesicle
- Spermathecal gland
- Bursa copulatrix

Which statement about the female reproductive system is CORRECT?

- Sperm are stored in the spermathecal gland.
- Each ovary produces one egg every month.
- Fertilization occurs in the spermatheca.
- The accessory gland secretes the egg shell.

Sometimes an egg develops without being fertilized by a member of the opposite sex. This type of reproduction is known as:

- Ovipary.
- Parthenogenesis.
- Paedogenesis.
- Ovoviparity.

Which statement about sex determination in insects is INCORRECT?

- Male wasps are haploid
- Male butterflies are haploid
- Female grasshoppers are diploid
- Female caddisflies are diploid

The genotype of a female butterfly is:

- XX
- XY
- WW

**WZ**

Insects that become sexually mature and produce offspring before they molt into adults are said to be:

- Paedogenic**
- Embryonic**
- Parthenogenetic**
- Viviparous**

- Clavate**

- Pectinate**



- Plumose**

- Geniculate**

- Capitate**

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Moniliform

filiform

5

**Scutellum**

**1. Abdomen**

6

**Labium**

**2.**

**Walking Leg**

6

**Paraglossa**

**3.**

**Head Capsule**

3

**Occiput**

**4.**

**Antenna**

3

**Clypeus**

**5.**

**Thorax**

**6.**

**Mouthparts**

