Student Handout #2-
Dichotomous Key for Aquatic Insects

1a. More than three pair of legs..... **not an insect**
1b. Zero to three pair of legs only..... **2**

2a. With obvious wings..... **adult insect (see adult key)**
2b. Without wings or with wing buds only..... **3**

3a. Wing buds present; not worm-like..... **4**
3b. No wing buds; may be worm-like..... **8**

4a. Long, piercing mouthpart begins at the top of the head; ranges in size from 2 to 60mm (true bugs) ..... **Hemiptera (Figure 1)**
4b. No piercing mouthpart..... **7**

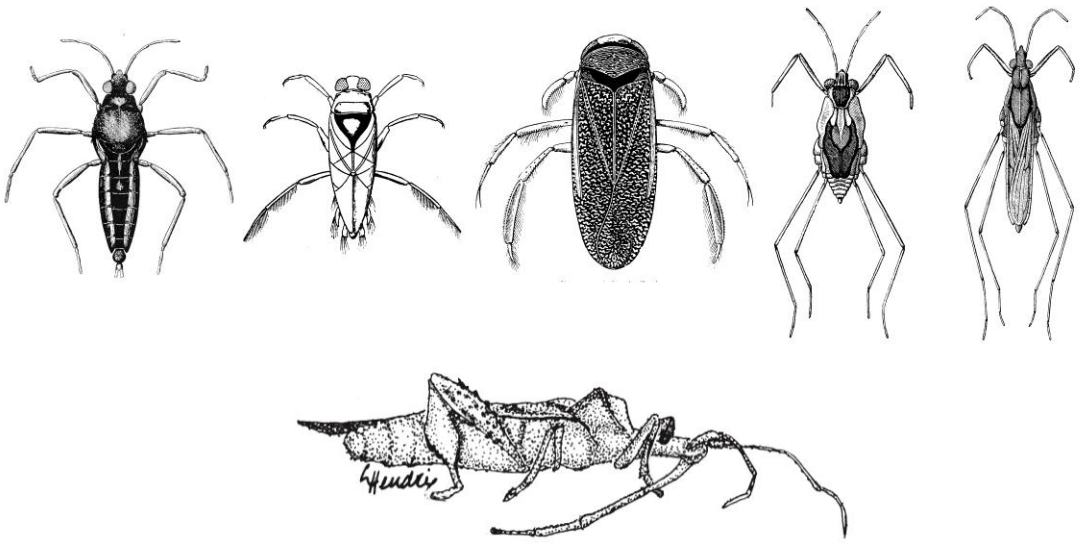

Figure 1.

5a. Underside of mouth with an extension arm that may cover face like a basket, or be flat against bottom of head, but usually with 'teeth' (jagged edges)..... **6**
5b. Lower mouthparts not obviously enlarged or able to be extended **7**

6a. Tip of Abdomen with three leaf like gills; ranges in size from 13 to 68mm, not including antennae or tails (damselflies)..... **Odonata (Figure 2)**

6b. Tip of Abdomen with terminal triangular-shaped spines; ranges in size from 13 to 68mm, not including antennae or tails (dragonflies)..... **Odonata (Figure 3)**

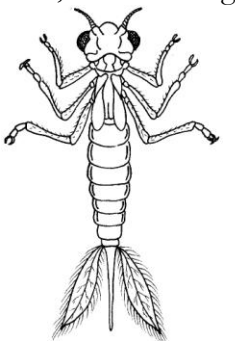

Figure 2.

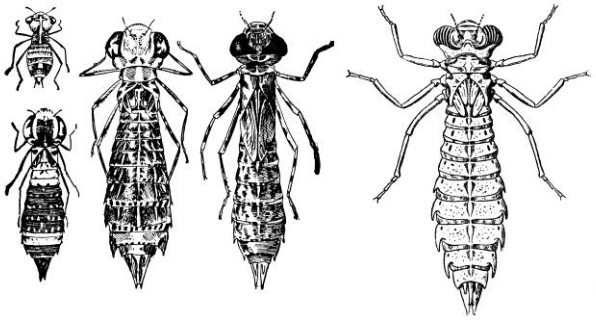

Figure 3.

7a. Abdomen with lateral gills that are 'leaf-like' or 'bushy'; gills can also look like a feather duster located all along the sides of the abdomen; also tip of abdomen with three tails' (rarely with only two); ranges in size from 2 to 32mm, not including antennae or tails (mayflies)..... **Ephemeroptera (Figure 4)**

7b. Thorax only with gills, never on sides of abdomen; look for feathery or "leaf-like" gills under the "armpits"; tip of abdomen with two 'tails'; ranges in size from 5 to 70mm, not including antennae or tails (stoneflies) ..... **Plecoptera (Figure 5)**

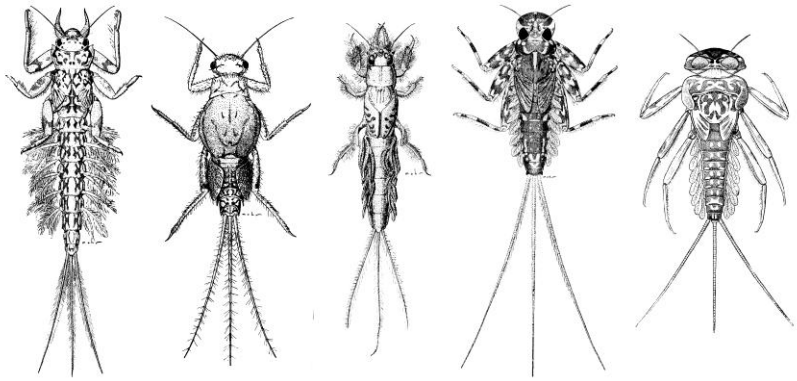

Figure 4.

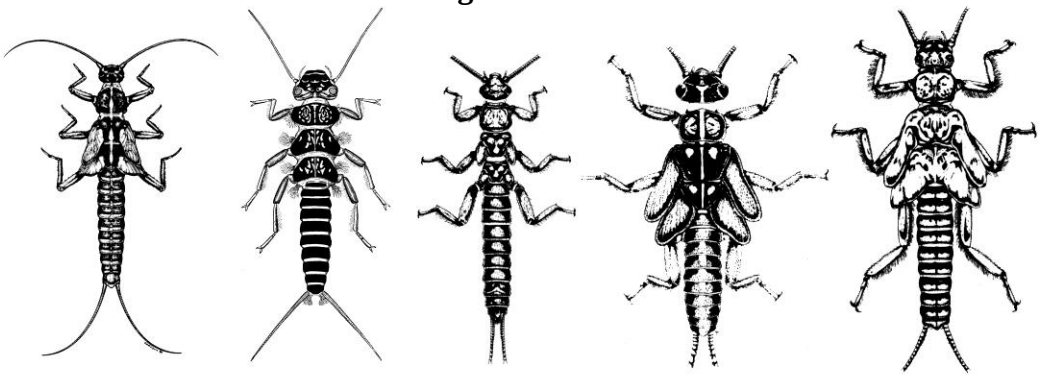

Figure 5.

8a. Mummy-like; wings, legs, antennae held tight against body wall, may or may not have a case or silken cocoon **pupa** (sing.)**pupae (**pl., **Figure 6)**

8b. Body worm-like, maggot-like, or caterpillar-like; zero or three pair of 'true' legs **9**

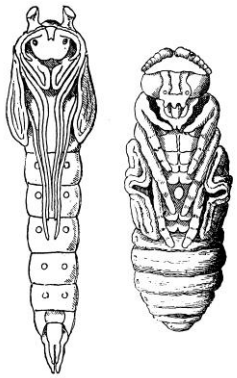

Figure 6.

9a. No true legs on the thorax; may have "false legs" on the abdomen **10**

9b. Three pair of true legs present on the thorax.....**12**

10a. Worm-like body without a distinct head capsule; ranges in size from 2 to 25mm, occasionally 100mm as mature larvae (flies).....**Diptera (Figure 7)**

10b. Worm-like body with a distinct head capsule **11**

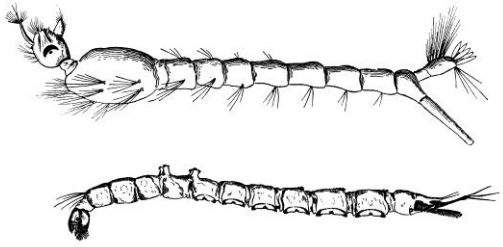

Figure 7.

11a. Worm-like body with a distinct head capsule and no structures on the end of the abdomen; ranges in size from 2 to 70mm, excluding tails .... **Coleoptera (Figure 8)**

11b. Worm-like body with a distinct head capsule and a breathing tube or other structure at the end of the abdomen; ranges in size from 2 to 25mm, occasionally 100mm as mature larvae..... **Diptera (Figure 9)**

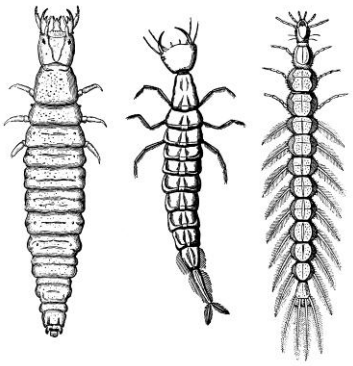

Figure 8.

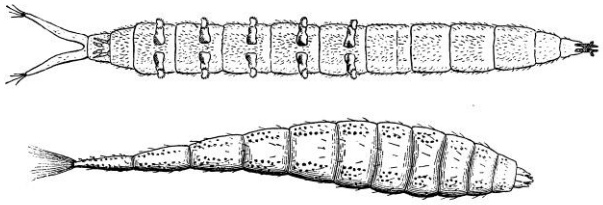

Figure 9.

12a. Large head with strong mandibles; with eight pair of gills, each extending laterally from an abdominal segment; ranges in size from 10 to 90mm (hellgrammites)..... **Neuroptera (Figure 10)**

12b. Worm-like body with or without a case that can be made of sand, pebbles, or sticks; ranges in size from 2 to 43mm (caddisflies) .... **Trichoptera (Figure 11)**

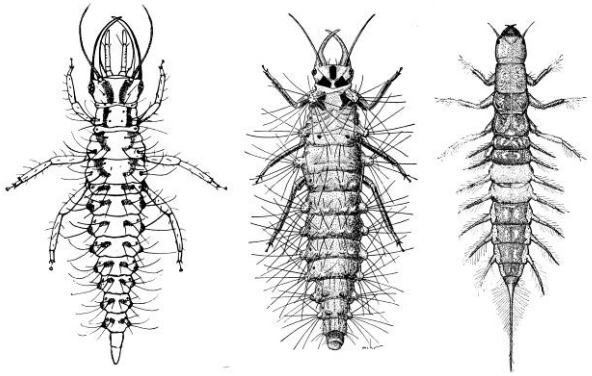

Figure 10.

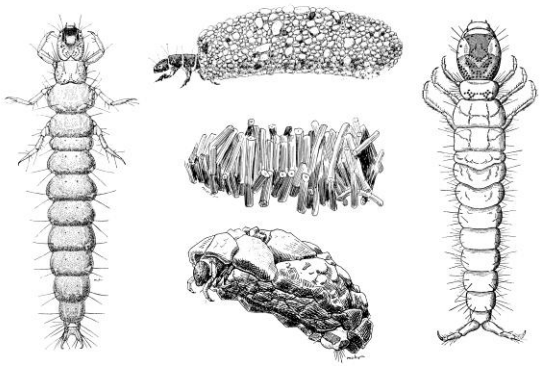

Figure 11.

Student Data Sheet

Microhabitat type:

Order	
Coleoptera	
Diptera	
Ephemeroptera	
Hemiptera	
Neuroptera	
Odonata	
Plecoptera	
Trichoptera	
unknown	

Student Data Sheet

Microhabitat type:

classification	
skaters adapted to skating across the surface of the water with their tarsi specialized for pushing water to propel them forward in pools within the stream	
divers adapted for swimming in mountain stream pools by "rowing" with their hind legs	
swimmers adapted for swimming in pools and runs much like fish and may cling to submerged objects in between bouts of swimming	
clingers adapted with long, curved tarsal claws, dorsoventral flattening, and ventral gills arranged as suckers for attaching to surfaces in stream riffles or they can have a fixed retreat	
sprawlers adapted for staying on top of leaves and debris or fine sediments found in pools within the stream while keeping their respiratory surfaces free of silt	
climbers adapted for moving up roots, sticks, and branches along the stream's edge (along runs) or stream bank undercuts (in pool areas)	
burrowers adapted to living in the fine sediments of stream pools, may even construct burrows of sand grain tubes which may extend above the surface of the substrate	
unknown	

References

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Images

Images used in this key are either public domain images from the following sources:

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