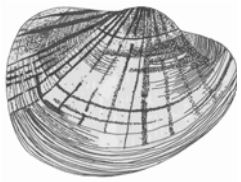
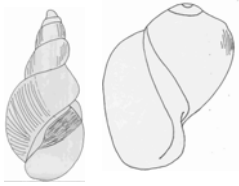
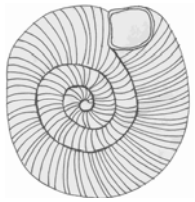
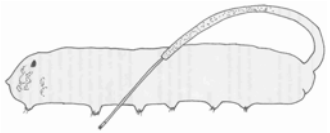
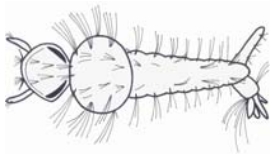
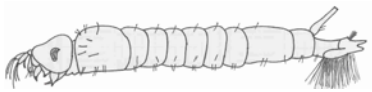
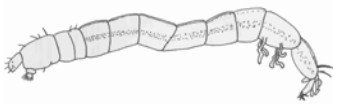
Key to Freshwater macroinvertebrates in Ontario

Drawings by Sarah Carter and Bruce Doran.

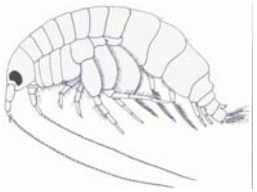
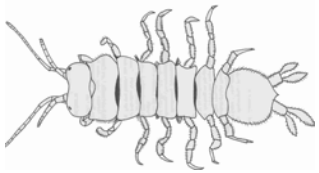
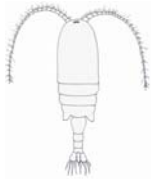
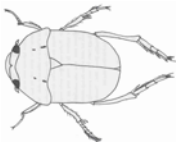
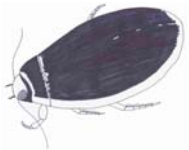
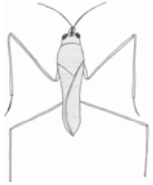
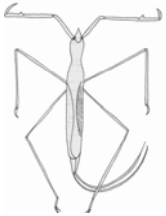
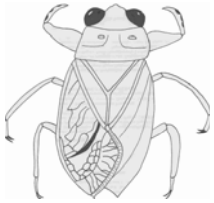
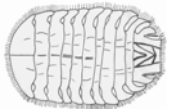
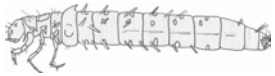
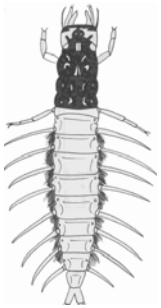
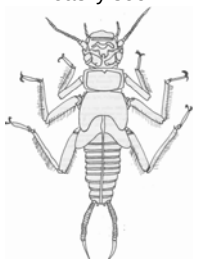
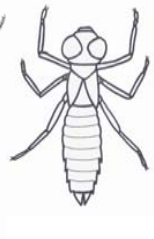
Copyright © 2005. St. Lawrence River Institute of Environmental Sciences. All rights reserved.

- With shell (Phylum Mollusca)
  - Hinged shell— 2X shelled (Class Pelecypoda)
    - < 1 cm in size
      -
      - Fingernail clam (Family Sphaeridae)
    - > 1 cm in size
      - 
      - Freshwater clam (Family Unionidae)
  - Single shell (Class Gastropoda)
    - Gilled / not gilled Spiral shell
      - 
      - Freshwater snails
    - Coiled shell
      - 
      - Ramshorn snail (Family Planorbidae)
- Without shell
  - Unsegmented body
    - Radial symmetry With tentacles
      -
      - Hydra (Phylum Cnidaria)
    - Cylindrical body
      -
      - Nematode (Phylum Nematoda)
    - Flattened body
      -
      - Planarian (Phylum Turbellaria)
  - Segmented body
    - No obvious legs
      - No obvious tail appendages & no head capsules with eyes (Phylum Annelida)
        - Smooth body with suckers
          -
          - Leech (Class Hirudinea)
        - Earthworm-like & tube dwelling
          -
          - Tubifex worm (Class Oligochaeta)
      - Tail appendages apparent **or** head capsule with eyes (Class Insecta; Order Diptera)
        - Head capsule and eyes not easily visible
          - One long tube-like tail appendage without tiny hair-like extensions; soft body
            - 
            - Rat-tailed maggot larva (Family Syrphidae)
          - One small tube-like tail appendage with tiny hair-like extensions; hardened & somewhat flattened body
            -
            - Soldierfly larva (Family Stratiomyidae)
          - One small tube-like tail appendage without tiny hair-like extensions; hardened & cylindrical body
            -
            - Deerfly larva (Family Tabanidae)
          - 3-5 small tail appendages usually fringed with tiny hair-like extensions; hardened & cylindrical body
            -
            - Cranefly larva (Family Tipulidae)
        - Head capsules with eyes easily visible
          - Posterior breathing tube
            - 
            - Mosquito larva (Family Culicidae)
          - Transparent body
            - 
            - Phantom midge larva (Family Chaoboridae)
          - Posterior “sucker”; attached to hard surfaces
            -
            - Blackfly larva (Family Simuliidae)
          - Prolegs (fake legs) present
            - 
            - Midgefly larva (Family Chironomidae)
    - Obvious legs (See reverse)

Drawings by Sarah Carter and Bruce Doran.

Copyright © 2005. St. Lawrence River Institute of Environmental Sciences. All rights reserved.

Obvious legs -See reverse side - (Phylum Arthropoda)

- 3 pairs of legs (Class Insecta)
- 4 pairs of legs (Class Arachnida)
  - Small (less than 5 mm in size)
    -
    - Water mite (Order Hydrachnida)
  - Large (greater than 5 mm in size)
    -
    - Fisher spider (Class Arachnida)
- More than 4 pairs of legs (Class Crustacea)
  - Flattened body
    - Flattened side to side (laterally); many legs visible
      - 
      - Sideswimmer (Order Amphipoda)
    - Flattened side to side (laterally); legs not visible
      -
      - Water flea (Order Cladocera)
    - Flattened front to back (dorsally-ventrally); many legs visible
      - 
      - Sowbug (Order Isopoda)
  - Cylindrical body
    - Lobster-like
      -
      - Crayfish (Order Decapoda)
    - Long-antennae Microscopic
      - 
      - Copepod (Order Copepoda)
- 2 pairs of wings (Adult insects)
  - 2 front pairs of wings completely hardened (elytra); chewing mouthparts (Order Coleoptera)
    - Swimmers or crawler; found underneath water surface
      - 
      - Scavenger water beetle (Family Hydrophilidae)
      - 
      - Predacious water beetle (Family Dytiscidae)
    - Actively swimming on water surface
      -
      - Whirligig beetle (Family Gyrinidae)
  - 2 front pairs of wings partially hardened; most have piercing mouthparts (Order Hemiptera)
    - On water surface
      - 
      - Water strider (Family Gerridae)
    - Underneath water surface
      - Elongated body with long posterior tube
        - 
        - Water scorpion (Family Nepidae)
      - Oval body & large (up to 7 cm)
        - 
        - Giant water bug (Family Belostomatidae)
      - Oval body & small (< 1.5 cm); swims on back (dorsal)
        -
        - Backswimmer (Family Notonectidae)
      - Oval body & small (< 1.5 cm); swims on front (ventral)
        -
        - Water boatmen (Family Corixidae)
- No wings (Immature insects)
  - No tail appendages
    - Free-living
      - Cylindrical body
        -
        - Riffle beetle larva (Order Coleoptera Family Elmidae)
      - Flattened oval body
        - 
        - Water penny larva (Order Coleoptera Family Psephenidae)
    - Lives in tubes or cases
      - 5 pairs of prolegs (fake legs)
        -
        - Aquatic caterpillar (Order Lepidoptera)
      - 3 pairs of segmented legs
        - 
        - Caddisfly larva (Order Trichoptera)
  - Tail appendages present (small or large)
    - One tail appendage or hooks at the end of abdomen
      - 
      - Alderfly or dosbsonfly larva (Order Megaloptera)
    - 2 tail appendages
      - Tail appendages small; large mandibles present
        -
        - Predacious diving beetle larva (Order Coleoptera Family Dytiscidae)
      - Tail appendages long; mandibles not easily seen
        - 
        - Stonefly nymph (Order Plecoptera)
    - 3 tail appendages
      - Tail appendages long & bristlelike
        -
        - Mayfly nymph (Order Ephemeroptera)
      - Tail appendages "feathery" or tiny
        -
        - Damselfy nymph
        - 
        - Dragonfly nymph
        - (Order Odonata)