Wetlands Ecology – Pond-dipping for Macroinvertebrates

Group Activity – 8 to 15 students, 20 to 30 minutes

Theme: Ponds and wetlands in Boulder County provide habitat for animals that live all or part of their life cycle in water

Activity: Exploring macroinvertebrates that live in the pond at the water's edge.

Supplies:

- 8 to 12 large yogurt cups
- 6 small plastic white pans
- Plastic spoons
- 2 large white dish pans
- Laminated diagrams
  - Pond invertebrates
  - Dragonfly life cycle
  - Field Guide to Aquatic Macroinvertebrates (Izaak Walton League)

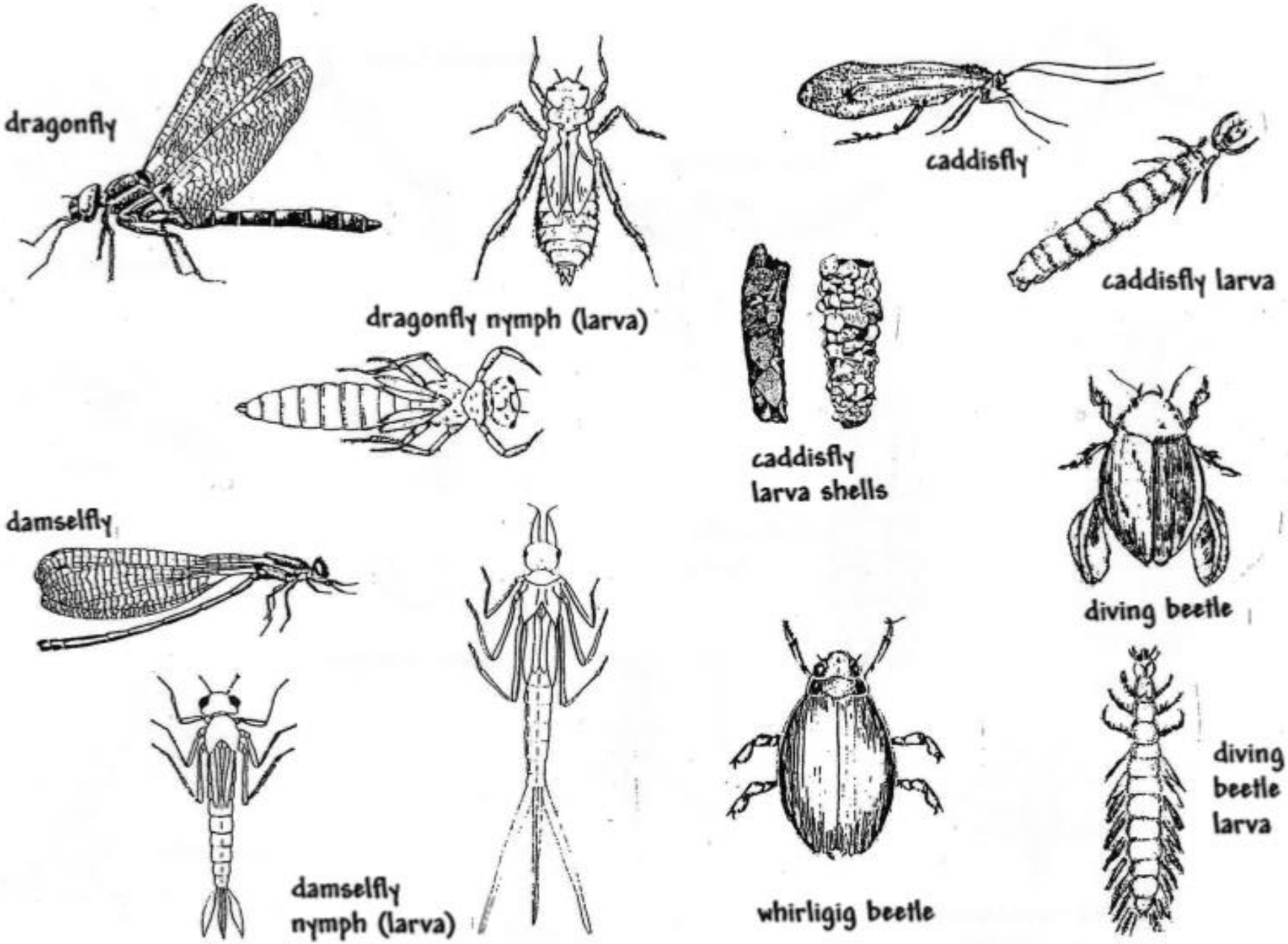
Other supplies you may want to bring:

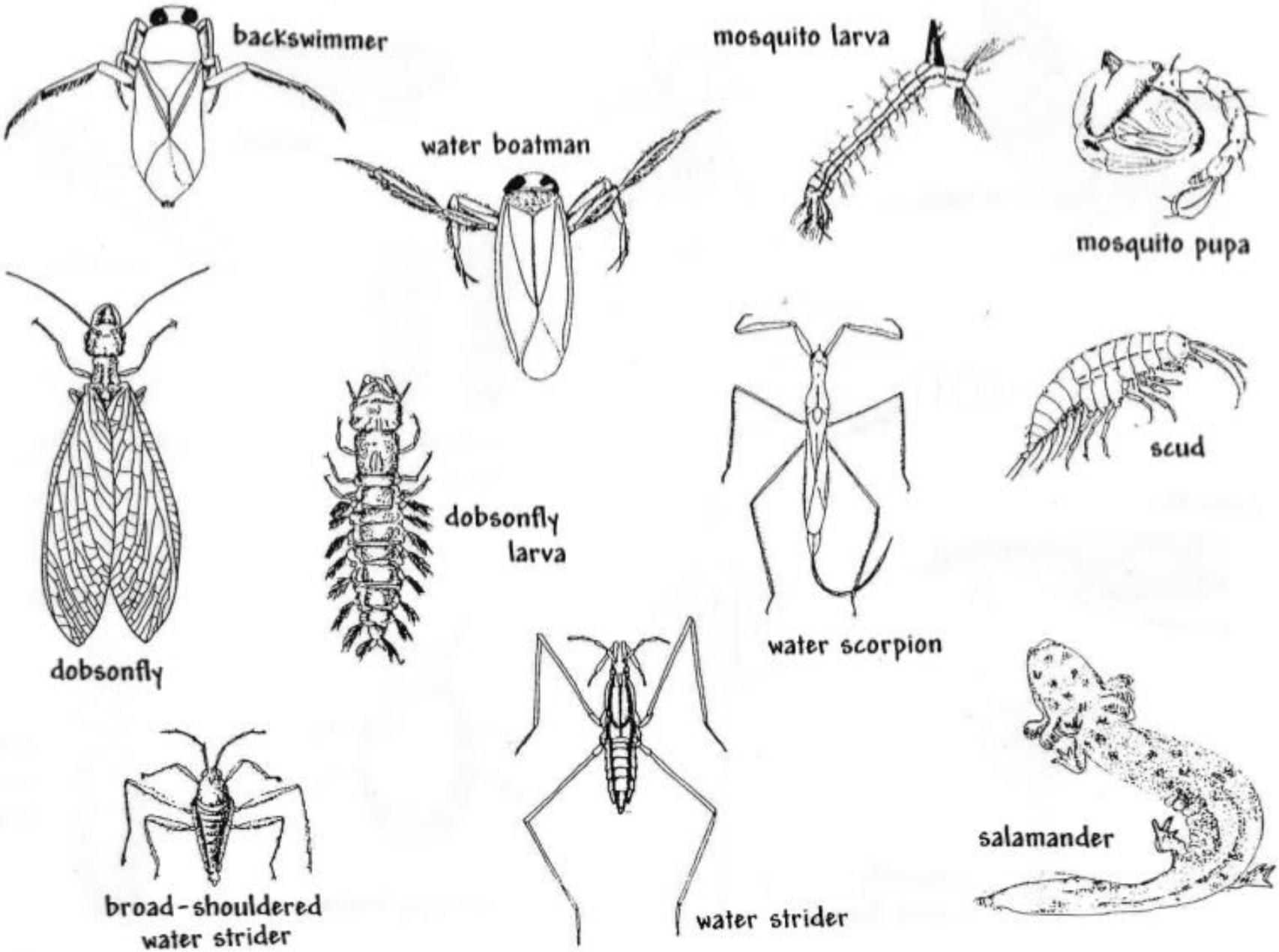
- Small scoop nets
- Small clear plastic viewing containers with magnifying glass
- Hand sanitizer
- Gallon of water for rinsing out pans (you can fill with water from the sink in the VN center)
- Bucket
- Old towel

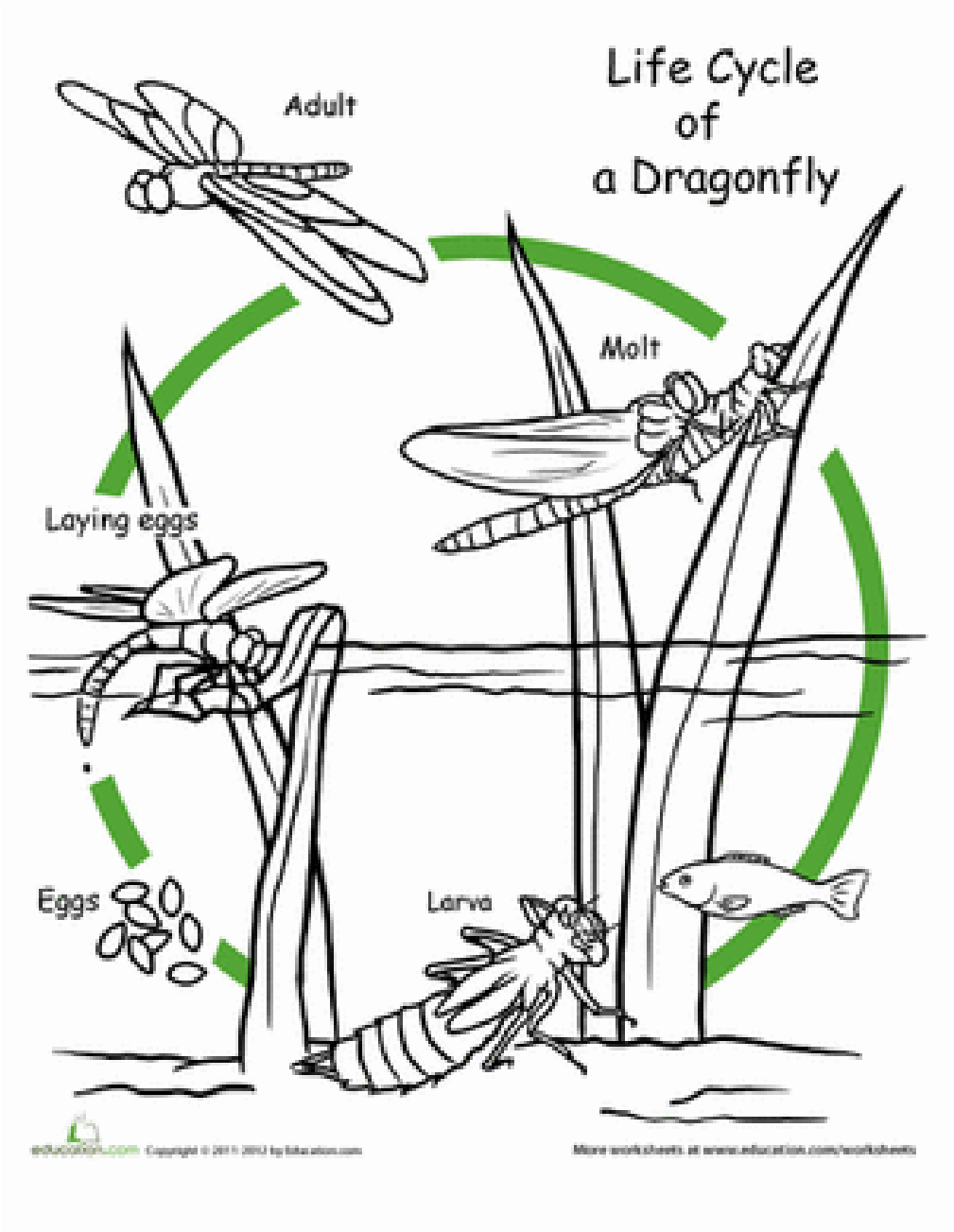
Introduction:

Invertebrates are animals without backbones, and 90% of all living animal species are invertebrates. Macroinvertebrates are invertebrates that are large enough to be viewed and identified without help of a microscope. A variety of invertebrates including insects, worms, crustacea (crayfish, scuds, water fleas) and snails live in the ponds at Walden and Pella Crossing.

The diagrams on the following pages show some of the invertebrates which are seen in pond water samples. Others may be observed swimming in the pond, skating on the water surface, or flying in the air near the pond. Small Invertebrates like water fleas, mosquito larvae, and scuds feed on the algae and water plants or other organic matter in pond water. Invertebrates, like dragonfly nymphs and water striders, are predatory insects that feed on these smaller invertebrates. These pond macroinvertebrates are an important part of the foodchain for fish, frogs, salamanders, and birds that live in or around the pond.


dragonfly
dragonfly nymph (larva)
caddisfly
caddisfly larva
caddisfly larva shells
diving beetle
damselfly
damselfly nymph (larva)
whirligig beetle
diving beetle larva


backswimmer
water boatman
mosquito larva
mosquito pupa
dobsonfly
dobsonfly larva
water scorpion
scud
broad-shouldered water strider
water strider
salamander



The diagram, shown above, is the life cycle of a dragonfly. Adult dragonflies mate and the female lays her eggs in the pond water. Eggs hatch into nymphs (larvae) which live in the water and feed on aquatic organisms. Nymphs grow in size and eventually climb out of the water, shed their *exoskeleton, and become adult dragonflies. Adult dragonflies are predatory insects, they catch and feed on smaller insects. Damselflies are close relatives of dragonflies and have a similar life cycle. Nymphs of both dragonflies and damselflies are observed in water samples taken from the ponds at Walden and Pella Crossing.

**An exoskeleton is a rigid external covering of the body in some invertebrates to provide support and protection. It's like having a skeleton on the outside of your body instead of on the inside.*

Aquatic macroinvertebrates are bio-indicator species. This means that they are indicators of the health of an ecosystem. The types of macroinvertebrates found in ponds, lakes, and streams will vary with the water quality. These differences are illustrated in the Field Guide to Aquatic Macroinvertebrates (Izaak Walton League). This guide is helpful in identifying species of invertebrates and the corresponding water quality.

Activity:

1. Introduce pond macroinvertebrates and the life cycle of a dragonfly.
2. Demonstrate pond-dipping. Encourage students to sample pond water that has some plant and/or algae mixed in with the sample.
3. Working in pairs (or alone if a smaller group), kids can sample the water at the pond's edge. To view their sample have the students pour it into a white plastic pan. Use the plastic spoons to tease apart the vegetation. Nymphs often hide in pond plants and will appear when the water stops moving. The laminated diagrams are helpful in identifying organisms.
4. For older students, have them try to figure out what type of macroinvertebrates they discover by matching them to the sample diagram sheet.
5. Have students return their water sample to the pond when they are finished viewing.
6. Cleanup the pond dipping supplies when you are finished. Rinse & dry viewing trays and sampling cups. Rinse out the nets.

Conclusion:

Ponds in Boulder County provide aquatic habitat for a variety of invertebrates, which are important to healthy wetland ecosystems. Many invertebrates live only in water, others live in water as juveniles and on land as adults.

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