common name: Water Flea

scientific name: *Simocephalus, Daphnia* and other unnamed species

phylum: Arthropoda
subphylum: Crustacea
class: Branchiopoda
order: Cladocera

habitat: vernal pools, lakes, ponds and wetlands

size: 0.2-3.0 mm

description: A Water Flea swims in a jerky, hopping motion like a flea. A carapace (shell) covers most of its body. The carapace is hinged on one side. The other side is open to allow the Water Flea's legs to move through the water to collect food and to swim. Some of the species in vernal pools are transparent (clear), while others are shades of brown. Scientists have not yet identified most of the species of Water Fleas in vernal pools. More than 80 percent of them still do not have names.

fun facts: During most of the wet phase of a vernal pool, the Water Fleas are all female. Each female can reproduce all by herself, without the help of a male. She produces fertile eggs and carries them in a brood pouch until they hatch. The brood pouch is like a knapsack that lies between her back and her carapace. It can hold up to 20 eggs. Sometimes the eggs get so heavy that the brood pouch tips the mother upside down! She swims upside down until the eggs hatch and she can release them into the water. All of her young are females that grow up

to be exact copies of the mother. This way of reproducing is called parthenogenesis.

life cycle

All summer long, special Water Flea cysts called epiphia (pronounced e-PI-fee-a) lie on the bottom of the vernal pool. These epiphia are adapted to survive many long, hot summers. When rainwater fills a vernal pool, the epiphia hatch into female Water Fleas. There are no males! As each female grows, her carapace becomes too small. She grows a new, larger carapace and sheds the old one. This process of growing and shedding is called molting.

As the vernal pool starts to dry up, the water gets warmer and there is less oxygen. These are signs that it is time for the Water Fleas to make epiphia. However, females cannot make epiphia without males. Almost like magic, about half of the female Water Fleas turn into males. They mate with the females. Instead of making young Water Fleas, the mated pair make two epiphia. The epiphia develop on the back of the female. They look like a dark brown saddle with two dark spots. When the epiphia mature, they fall to the bottom of the pool. Not all the epiphia will hatch the next winter. Some will stay on the bottom for many years, awaiting just the right conditions to make them hatch.

ecology

Water Fleas are filter feeders. They collect detritus, Algae, Bacteria, and Protozoa with their legs. The legs sweep the tiny particles of food into a food groove that leads to the mouth. Water Fleas are eaten by the fierce larvae of Damselflies and Aquatic Beetles (especially Dytiscid beetle larvae). Other major predators of Water Fleas are the Backswimmer, Water Boatman and the larvae of the Phantom Midge. The Phantom Midge larva has two floats and a special hook that is designed to catch Water Fleas!

investigate

In vernal pools you will see some species of Water Fleas that only live in vernal pools. Other species of Water Fleas live in other wetlands, ponds and even roadside ditches (in the winter). You can easily collect Water Fleas from these other locations. It is fun to watch them for awhile before you return them to their habitat.

To collect Water Fleas: First, put water from their habitat into a wide-mouthed container. Gently sweep a small, fine aquarium net through their habitat. (The fine nets are usually white, not green.) Put the net into the container of water and turn it inside-out to release the Water Fleas. You will probably find other species of aquatic critters that look like those in vernal pools. See how many you can identify using the Critter Catalog in your classroom or online at www.sacsplash.org.