PIMA COUNTY
NATURAL RESOURCES
PARKS & RECREATION

Aquatic Ecosystems – Grades 4-6

Description: Aquatic Ecosystems
The natural spring and pond at Agua Caliente Park are teeming with life. Use nets, skimmers and buckets to collect water samples and then watch the water come to life under the microscope. Students refine their observation skills and sketch aquatic invertebrates.

Duration: 2 ½ hours

Objectives:

- Identify the biotic and abiotic components of the aquatic ecosystem at Agua Caliente Park and construct an ecosystem model
- Learn the techniques and use of equipment for collecting, sorting and observing aquatic organisms
- Use a dichotomous key to identify aquatic macro-invertebrates
- Identify adaptations of aquatic plants and animals that allow them to live in a specific environment

Vocabulary:

Abdomen	Cephalothorax	Larvae
Abiotic	Collector-gatherers	Macro- invertebrate
Adaptation	Decomposer	Plankton
Appendages	Dichotomous key	Scrapers
Aquatic	Engulfers-predators	Shredders-detritovores
Benthic	Habitat	Thorax
Biotic	Invertebrate	Vertebrate

Equipment and Materials:

Ecosystem component worksheet
D-net, dip nets, collecting buckets, sorting trays, viewers
Binocular scopes, hand lenses, dichotomous keys, depression slides

Description of activity:

- Through field observations of aquatic habitats at Agua Caliente Park students determine the living and non-living components of the aquatic ecosystem (spring [the source of the water], benthic substrate [minerals and nutrients], atmosphere [O_2, N_2 and CO_2], sunlight, algae, cattails, reeds, fish, turtles, frogs, ducks, herons, kingfishers, macro-invertebrates, plankton, etc.).
- Students record the components on a provided worksheet.
- Students collect algae, benthic macro-invertebrates, fish, and plankton using D-nets, dip nets and plankton nets.

- Students sort collected organisms and observe them with hand lenses, scopes and viewers. Discuss organisms in terms of anatomy, life cycles, feeding mechanisms, breathing mechanisms Students use a dichotomous key to identify macro-invertebrates collected.
- Students sketch or make a biological illustration of one organism and label basic body parts.
- Students make a diagram or a model of the ecosystem showing the biotic and abiotic components, source and flow of energy and materials through the system including the water cycle.
- Discuss the value of aquatic ecosystems and associated riparian ecosystems. Riparian Restoration is a central element of the Sonoran Desert Conservation Plan. In many Tucson watercourses, stream flow has disappeared due to groundwater pumping development. Today we have an opportunity to repair riparian corridors and aquatic habitats as a gathering place for people and wildlife.

Late arrivals: Rather than sketching a model of the aquatic ecosystem, briefly discuss how biotic and abiotic parts of the ecosystem all work together to create a functioning ecosystem. Ask students to point out connections between abiotic and biotic parts, and connections between biotic parts (i.e. predator/prey, herbivores/food source). This change should save about 20 minutes. If more time needs to be made up, shorten the time students spend with the microscopes. Prepare several different slides or specimens for the students to examine and then do a rotation. The important thing is to allow the students to have an outdoor experience and begin to understand an aquatic ecosystem.

Linked to Arizona Academic Standards: Science S4: C1- G1PO2, G1PO3; G2PO1, G2PO3; G4PO2; G6PO1, G6PO6; C2-G1PO2, G2PO1, G2PO3; G3PO2; C3-KPO1, KPO2, G1PO1, G1PO3; G3PO1, G3PO2, G3PO3, G3PO4, G3PO5; G4PO1 G4PO3; G4PO1, G4PO3; G6PO1, G6PO2; G7PO1, G7PO2, G7PO3, G7PO5, G7PO6, C4-G3PO1; G4PO1, G4PO2; G8PO1, G8PO5, G8PO6; 3SS-F2PO5; 3SS-E7PO6; 3SSP4PO3, 3SS P4PO3; 4SS-F4, F7, E7, P4, P6.