PIMA COUNTY
NATURAL RESOURCES
PARKS & RECREATION

Predator, Prey, Room to Roam Field Study
Grades 4-6

Program Description: This class is designed to accommodate up to three groups of students with thirty student per group utilizing two staff persons and one volunteer or teacher. Groups rotate through three, forty-five minute activities including a predator/prey-themed nature walk, a predator-prey simulation game, and a mammal lab focusing on identification of mammal predators and prey based on the skulls/dentition, tracks, and hair samples. Students make observations in nature of predator-prey signs at the park; collect, graph, and analyze data; and make and record measurements of mammalian characteristics that can be used to make identifications of mammalian species. The mammal lab includes information on the value of linkages among wildlife conservation areas in Pima County.

Duration: 2.5 hours

Objectives:

- Develop observation skills while searching for signs of predator and prey species during a nature walk
- Record, graph, and analyze data collected during a predator-prey simulation activity
- Recognize the size of predator populations depends on the population size of prey.
- Learn about and use measurements of mammal predator and prey species characteristics to make species identifications
- Recognize the value of identification of mammal species from skulls, hair, and tracks to several science disciplines
- Develop an awareness of the importance of linkages/connectivity of Pima County wildlife conservation areas to maintaining long term ecosystem health.

Vocabulary:

Dentition	Incisors	Canines (tooth)	Premolars
Molars	Carnassials	Predator	Prey
Cuticle (hair)	Cortex (hair)	Medulla (hair)	Corridors (wildlife)
Linkages (wildlife)	Gene pool		

Equipment and Materials:

Predator/prey-themed nature walk:
Binoculars (one per student)

Predator-Prey Simulation Game:
12 marker cones (border for playing “field”)
50, 10-inch square plates to represent predators
200, 6-inch square plates to represent prey
Large, laminated graph to record number of predators and prey in each generation
Wet-erase pens to record data on laminated graph
Directions for playing the Predator-Prey Simulation Game

Mammal Lab:
Four tables/stations
Mammal Lab worksheets (one per student)
Clipboards (one per student)
Pencils
Cloth tape measures
Four posters/graphics on Skulls, Tracks, Hair, and Linkages
Black bear skull
Mountain Lion skull
Bobcat skull
Coyote skull
Javelina skull

Description of Activity:

Preparation:

Lead teacher assigns students into three groups with a maximum of thirty students per group. Group sizes of thirty-one to sixty students are divided into two groups. Group sizes of thirty students or less remain in one group.

Introduction:

Welcome
Overview of the day
Expectations: rules and safety considerations

Rationale:

Scientists study the ecology of predators and prey by direct and indirect observations. Direct observation of wildlife is often difficult and time consuming. Much can be learned about predator-prey interactions through indirect observations of skulls, dentition, tracks, scat, and hairs of wild species. Identification of species using indirect observations can be very beneficial to many disciplines of science including forensics or crime solving.

Activity Description:

Predator-Prey themed nature walk: Students participate in a staff-guided, forty-five minute nature walk at Agua Caliente Park looking for signs of the presence of predator and prey species, ranging from ant lions to mountain lions, and ants to mule deer. Examples of predator-prey interactions:
Mule deer – Mountain Lions
Small birds – Cooper's Hawks
Tarantulas – Tarantula Hawks
Bull frogs – Great Blue Herons
Blue gills – Largemouth Bass
Ants – Ant Lions
Cottontails – Bobcats
Insects – Spiders
Javelina – Coyotes

Predator-Prey Simulation Game: Students use proxies of predators (large square plates) and predators (small square plates) to simulate the rise and fall of predator populations based on the

abundance of prey populations. Students play the game through at least 10 generations. The number of prey and predators in the respective populations are recorded for each generation on a large laminated graph. After playing the game for at least ten generations, students analyze the results based on the graph. Game is led by a volunteer or teacher who has been informed of the rules of the game.

Mammal Lab:
The mammal lab is designed to be set up either in the Rose Cottage or at an outdoor teaching station with four tables. Group sizes of thirty or fewer students are divided into four groups which rotate among four stations for a ten-minute period at each station. At each station students follow directions on a Mammal Lab worksheet to make measurements and observations of mammal parts in order to make identification of species. At the fourth station student learn about the importance of linkages of wildlife conservation areas (wildlands) to maintain large gene pools. Based on maps and information provided on the connectivity of wildlands in Pima County (Linkages poster), students work as a team to make recommendations on where increased connectivity through overpasses and underpasses would aid predator and prey populations.

Late Arrivals: This field study program is designed for 2.5 hours of instruction (depending on grade level). If the group arrives late or needs to leave early the Predator-Prey Simulation game could be deleted. This game could still be played back in the classroom.

Linked to Arizona State Standards:
Science: S1:C1-G4PO1, G4PO4, G5PO1,3; C2-G4PO4,5, G5PO3,4,5,G6PO4,5; C3-G4PO1,2,3, G5PO1,2,G6PO1; C4-G4PO1,2, G5PO1,2, G6PO1,2,3; S2:C2,G6PO3; S3:C1-G4PO1,2, G5PO1; S4:C1,G4PO1,2, G5PO1,G6PO6; C3-G4PO1,3, G6PO2; C4-G4PO2; S5: **Math:** 4.MP.1; 4.MP.2; 4.MP.3; 4.MP.4; 4.MP.5; 4.MP.6; 4.MP.7; 5.MP.1; 5.MP.2; 5.MP.3; 5.MP.4; 5.MP.5; 5.MP.6; 5.MP.7; 6.MP.1; 6.MP.2; 6.MP.3; 6.MP.4; 6.MP.5; 6.MP.6;

Next Generation Science Standards:
Practices:
This Field Study naturally supports the following Science and Engineering Practices:
Asking questions (for science) and defining problems (for engineering), Planning and carrying out investigations, Analyzing and interpreting data, Using mathematics and computational thinking, Constructing explanations (for science) and designing solutions (for engineering), Engaging in argument from evidence.
Follow-up opportunities support the following Science and Engineering Practices:
Obtaining, evaluating, and communicating information and developing and using models.