

Overview and Purpose

To establish the first United States High School student-led research program using Global Positioning System (GPS) Radio-collars that establishes the urban component of the Narragansett Bay Coyote Study. To feed our knowledge and data into a broader education program that establishes best management ecological, economical, and social practices of both coyotes and humans that lead to a peaceful coexistence between the two species. From two years of qualitative student coyote research and polling public coyote sightings, it looks like the urban coyotes are acting quite differently than suburban or rural coyotes in the State of Rhode Island. There is also a set of common coyote behaviors, where with citizen awareness; we can react to interactions with coyotes in a sustainable manor. Hence an important part of this unit must be public outreach with a purpose of education. The more we know, the better our decisions will be. Obviously schools are perfect places for disseminating education.

Materials

I have gathered materials for the enclosed lab; mammal skulls, skins and scats, with pictures and drawings of tracks. I am photographing track stories this winter on my sabbatical. The poll included is modified from work done by Vancouver, British Columbia's SPCA and a Coyote Kit they put out. It has been revised twice and needs further revision, like adding poll takers town of residence.

Procedure

All these materials could be duplicated into a kit that could be borrowed by schools as done by the East Bay Collaborative Kits in Warren and the Audubon Society of Rhode Island Education Kits in Smithfield. An existing loan center would be better equipped to circulate and refurbish a coyote lab kit than we would be. I'd be glad to propose the idea for funding and dissemination. I have no financial interest in it. My goal is to educate students, and secondarily the public through students.

2007

Winning Lesson Plan
from Providence, Rhode
Island

Coyote Kids

by Robert Brown
The Wheeler School

Subject: Science
Grade Level: 9–12
Duration: 2–4 Weeks

Objectives and Educational Standards

(These were generated when I first envisioned and wrote this inquiry curriculum, which I have attached, at the E.E. Just Institute in the summer of 2005. At the time I knew that Revere High School in Boston was doing radio-collar research of urban coyotes, but I did not imagine doing a radio-collar study, much less a GPS radio-collar study, as part of my ultimate curriculum. These objectives were aligned with existing National and Massachusetts science standards and now align well with the Rhode Island Department of Education science standards currently proposed for the three state region of Rhode Island, Vermont and New Hampshire-See highlighted 19 pages of Draft-RI K-12 Grade Span Expectations in Science-Life Sciences)

1. Generate hypotheses, brainstorm, sort, classify, explore, contrast, gather significant data, observe, identify, analyze, evaluate, calculate, work with community resources, design and run polls.
2. Analyze mammal form (skulls, skins and scat) and function (tracks).
3. Represent data in ways that are easy to manipulate and are significant.
4. Explain data and manipulate it mathematically. Identify outliers that are anomalous, patterns that are powerful and telling.
5. Define and organize data using Geographic Information Systems (G.I.S.)
6. Analyze data connections and patterns using newest version of ArcGIS (9.2)
7. Use internet for background research on coyotes to answer student inquiries. Stress source credibility, proper citation format, cross-referencing, and redundancy in research.
8. Problem solve and extend solutions into a public outreach through many forms and forums of media.
9. Understand their audience through poll profiling, interviewing and use of demographic data.
10. Develop a deeper sense of bias and multiple perspectives. Understand the use of propaganda. Develop a more sophisticated media literacy.
11. Understand that compromise from a good cost-benefit analysis is often one of the most accepted and sustainable solutions to environmental problems and issues.
12. Understand the precautionary principle: "An ounce of prevention is worth a pound of cure"
13. Through public/neighborhood meetings work on oral and graphic presentation skills that highlight all of the above objectives.
14. Through team research and team work, enter team competitions and/or exhibitions that allow students to perform on state, regional, national and international stages. Encourage student research finding publication in appropriate periodicals/journals. (See dissemination plan)

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Coyote Lab

(Part of Actual Handout – Field tested for two years in 8 classrooms)

Mammal Skulls – Station W

Do not let skull(s) get separated from number.

Skulls #1, #2 and #3 are all herbivore prey of coyotes.

Skulls #1: Note lattice-work (fenestration) on upper jaw (maxilla) and 2 sets of upper incisors
 Use skull list of characteristics. ID _____

Skulls #2: “A” rodent that jumps from tree to tree w/ dangerous bite. ID _____
 It’s smaller cousin, “B”, loves to run along stone walls ID _____

Skulls #3: Is only taken by coyotes when it is sick, very old or very young. The # of points on its antlers tell you health, not age. An ungulate _____

Skulls #4: Both A and B chew trees, beavers (aspen) and porcupines (hemlock)
 Which is more streamlined to swim through and under water? A or B (Circle)

Skulls #5, #6, #7: Skulls A, B, C are all called cats. The true feline has the flattest face and orbits (eye sockets on front of face). The opossum (possum cat) has the most number of teeth (50) in the mammal world and a raised sagittal (brain) crest (where strong facial muscles attach). The raccoon (coon cat) has a rounded skull crest. Match the letter with right mammal.
 Raccoon _____ Opossum _____ Cat _____

Skulls #8: Using your skull list, which is the Red Fox _____ and Gray Fox _____

Skulls #9: Skulls A and B are both canids. The large dog skull is larger than the coyote skull.
 Dog _____ Coyote _____

Skulls #10: Skull Anatomy – Using your resource, match the following parts with letters.
 Auditory Bullae _____ Maxilla _____ Mandible _____
 Rostrum _____ Sagittal Crest _____ Zygomatic arch _____

Bonus: A mostly domestic animal that scares away coyotes with their tusks, which make their ripping bite worse than their snort!
 ID _____

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Coyote Lab (Cont'd)

Mammal Skins – Station I

Do not move skins or numbers.

#1: Our feature creature! Who has the longer nose? (Better to smell you with ladle rat rotten hut!)
Coyote or Fox (Circle correct answer)

#2: Both the red and gray fox can have a red colormorph (phase), but the tip of the grey fox is black like the coyote. Match the fox with the correct letter.

Red fox _____ Gray Fox _____

#3 – #6: Skins A-D are all mustelids (weasel family) with musk glands in their posterior. Using your field guides to determine length match the correct letter with the skins

Weasel _____ Otter _____ Mink _____ Skunk _____

#7: All three skins come from this lawn herbivore prey of the coyote. Note size

ID _____

#8: This barnyard domestic prey of the coyote will eat almost any plants and bushes including poison ivy. It's skin has been tanned (treated with tannic acid to stop rotting) to leather. It's hair is shorter than a cow's hair.

ID _____

#9: This mammal is a prime prey of groups of coyotes, preying on ones injured by human hunters. It's tail "flags" as it jumps over obstacles.

ID _____

#10: This is a common predator of coyotes out west, especially in Wisconsin (state animal).

ID _____

Bonus: This mammal is a marsupial with a prehensile tail. Use Field Books.

ID _____

Stations "L" – Scats and "Y" – Tracks not included as part of whole WILY Coyote LAB because of lack of space.

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Coyote Kids Survey

I am male ___ female ___ 0-20___ 20-40___ 40-60___ 60+___ years old

I live in Urban___ Suburban___ Rural___ Rhode Island___ SE Mass___

Do you think that there are wild coyotes in your town/area? Yes___ No___

Have you seen a coyote or coyotes in the past year? Yes___ No___
 (If yes, circle all that apply) Numbers of coyotes seen at same time: 1 2 3 4 5 6 More

Season: Fall/Winter/Spring/Summer

Time of Day: Dusk/Night/Dawn/Day

Location(s) Town and road name: _____ Area Description: _____
 (Use back for more locations)

If you have a complaint about a coyote in your neighborhood you should call:

A Veterinarian___ SPCA___ Local Police___ DEM___ Audubon Society___

Other (list) _____

If a coyote is considered a "wildlife problem", it should be:

Tolerated___ Relocated___ Destroyed___ A Focus of Public Education___ Not Sure___

Other _____

Do you place your garbage out the night before it's collected? Yes (Y)___ No (N)___

Do you have an outdoor compost pile? Y___ N___ If so, do you put meat in it? Y___ N___

Do you have pets? Y___ N___ If yes, do they go outside? Y___ N___ Fed outside? Y___ N___

Do you feed birds? Y___ N___ If so, in hanging feeder? Y___ N___ On the ground? Y___ N___

Have you ever tried to discourage animals from coming on your property? Y___ N___

Circle how you feel about coyotes?

1. Strongly Dislike 2. Dislike 3. Neutral 4. Like 5. Strongly Like

Do you think coyotes have any benefit for humans? Y___ N___ If yes, describe:

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