**\*\*Park Name**

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| --- |
| [Badlands National Park](http://www.nps.gov/badl/index.htm) |

**\*\*Lesson Plan Title (255 characters maximum)**

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| --- |
| Swift Fox Data Analysis Lab |

**\*\*Essential Question and Quick Lesson Description**

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| In this lesson, students will take on the role of a wildlife biologist and analyze actual 2003 swift fox translocation data from Badlands National Park. Students will work together to compile a master data sheet showing their findings. |

**\*\*Lesson Grade Level: (Check One of the following)**

High School: 9th-12th Grade

**\*\*Lesson Subject: (Check As Many as Apply)**

Science

**Feature Image for Lesson**

**This will be shown next to your lesson on the Education Portal. Provide filename and location below.**

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| <http://www.nps.gov/common/uploads/teachers/assets/images/mwr/park/badl/317FAB30-155D-4519-3E6BD9189533DF61/317FAB30-155D-4519-3E6BD9189533DF61.jpg> |

**Alt Text for Feature Image**

**If the image does not display, what description do you want to appear in its place?**

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| --- |
| Swift fox |

**\*\*Common Core Standards:**

**Want more information about Common Core? Go to** [**http://www.corestandards.org/**](http:///h)

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| **Grade Level: 9-12 Subject Area: Science**  **Common Core Standards:**  RST.11-12.1 - Cite specific textual evidence to support analysis of science and technical texts, attending to important distinctions the author makes and to any gaps or inconsistencies in the account.  RST.11-12.7 - Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., quantitative data, video, multimedia) in order to address a question or solve a problem.  RST.9-10.8 - Assess the extent to which the reasoning and evidence in a text support the author’s claim or a recommendation for solving a scientific or technical problem.  RST.11-12.8 - Evaluate the hypotheses, data, analysis, and conclusions in a science or technical text, verifying the data when possible and corroborating or challenging conclusions with other sources of information. |

**\*\*State Standards:**

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| **State:** CO **Subject** : Life Science **Grade Level:** 9-12  **State Standards**  9-12.L.3.1, 9-12.N.1.1, 9-12.N.1.2 |

**Additional Standards(s) (255 characters maximum): Does this lesson meet additional standards?**

**e.g. Next Generation Science Standards, National Council for Social Studies Standards, Advanced Placement (AP) Courses, International Baccalaureate (IB) Courses, Next Generation Science Standards**

|  |
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| Next Generation Science: HS-LS4 Biological Evolution  4-LS1-1. Construct an argument that plants and animals have internal and external structures that function to support survival, growth, behavior, and reproduction  4-LS1-2. Use a model to describe that animals receive different types of information through their senses, process the information in their brain, and respond to the information in different ways. |

**Thinking Skills (Check As Many as Apply)**

The thinking skills listed below are based on Bloom’s Taxonomy. Consider your lesson procedure and activities. Then check off the thinking skills that students will experience through your lesson.

\_\_\_ **Knowledge** – Recalling or recognizing information ideas, and principles

X **Comprehension** – Understand the main idea of material heard, viewed, or read. Interpret or

summarize the ideas in own words.

X **Application** – Apply an abstract idea in a concrete situation to solve a problem or relate it to a

prior experience.

X **Analysis** – Break down a concept or idea into parts and show the relationships among the parts.

\_\_\_ **Creation** – Bring together parts (elements, compounds) of knowledge to form a whole and build

relationships for NEW situations.

X **Evaluation** – Make informed judgments about the value of ideas or materials. Use standards and

criteria to support opinions and views.

**Complete Lesson File**

**Is there a downloadable file (or PDF) for this lesson plan? If yes, provide filename and location:**

**Be sure your PDF or other file meets universal accessibility requirements, most PDFs do not.**

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**Lesson Duration**

**Time to complete this lesson plan in minutes (25 characters maximum)**

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| Two 50 minute periods |

**\*\*Background Information for Teacher**

**What important content, contextual, or practical information and background knowledge does the teacher need to successfully implement this lesson?**

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| While out and about, swift foxes must be on the look out for potential dangers. Animals like golden eagles and badgers are on the prowl for their own meals. Coyotes are usually the most pressing threat in a swift fox’s life, both hunting the foxes and competing for the same food. Living in mixed-grass prairie means foxes have a clear view of the area surrounding them. If foxes spot predators, the small canines will dive into a burrow for protection. Running is also a defense mechanism for the foxes, and the reason for their name. Clocked at about 35 mph, the swift fox can run as fast as a car travels on smaller city roads. |

**\*\*Important Vocabulary and Terms with Definitions:**

**What terms and academic language will students have to know to participate in the lesson? Lessons typically include 5 to 15 terms and definitions.**

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| Mortality: the state of being subject to death  Sire: the male parent of an animal  Dam: the female parent of an animal  Wild born: an animal born in a natural environment  Disease: an illness or sickness with specific, well defined symptoms  Contagion: the passing of disease from one person to another by close contact  Plague: a contagious disease that spreads quickly and kills many people  Tularemia: a severe infectious bacterial disease of animals that can be passed to humans  Parvo: any class of very small viruses that affect mainly animals  Canine distemper virus (CDV): a viral disease of some animals, especially dogs. |

**\*\*Lesson Preparation: What preparation does the teacher need to do before the lesson? What supplies or materials should be gathered?**

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| Teachers should reference the Teacher Background Information document, which is included in the Materials section of this lesson plan and can also be accessed through the following link: <http://www.nps.gov/badl/forteachers/classrooms/upload/SwiftFox_TBI.pdf> |

**\*\*Lesson Hook or Preview: What activity, video, song, or other experience could get the students excited about the lesson and thinking about the topic? Is there a way to make the lesson important to their lives or link the lesson content to what they already know?**

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| Teacher can ask students to do a “turn and talk” to discuss what they know about swift foxes. |

**\*\*Procedure: List the instructions the teacher should follow as Step One, Step Two, Step Three, etc.**

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| Step 1: Place the [2003 swift fox data sheets](http://www.nps.gov/badl/forteachers/classrooms/upload/SwiftFox3_StudentDataSheets-2.pdf) at separate stations around the room.  Step 2: Students should be in a location where they are able to move from one data station to another. Students will be assigned random swift fox numbers from up to 3 different foxes, depending on class size. There are 40 foxes included in the 2003 study data.  Step 3: Students will act as biologists and collect information on their specific foxes from the data tables posted around the room. Students will fill out a [Fox File](http://www.nps.gov/badl/forteachers/classrooms/upload/SwiftFox3_FoxFilesStudentSheet.pdf) card for each different fox they have been assigned. Information will consist of finding the fox's gender, age, weight, capture location, capture date, date released into Badlands National Park, disease information, breeding information, mortality dates, etc. This information will then be compiled into one master list of foxes 1-40.  Step 4: Students will be responsible for contributing their Fox File information for the master data lists that students will compile, using the [Blank 2003 Swift Fox Translocation Chart Student Sheets](http://www.nps.gov/badl/forteachers/classrooms/upload/SwiftFox3_BlankMasterSheet.pdf). Teachers should use the [2003 Swift Fox Teacher Key](http://www.nps.gov/badl/forteachers/classrooms/upload/SwiftFox3_TeacherKey.pdf) for reference. |

**Lesson Materials: Any worksheets, photos, primary source, scientific data, maps, graphic organizers, or PowerPoints should be described and attached using the template below. Please create additional materials boxes if necessary.**

**Material #1**

**Title (255 characters maximum):**

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| 2003 Swift Fox Data Sheets |

**Summary (how does the material function in the lesson?):**

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**Downloadable file of this material in original format if possible, such as Microsoft word or PowerPoint (Provide filename and location)**

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| <http://www.nps.gov/badl/forteachers/classrooms/upload/SwiftFox3_StudentDataSheets-2.pdf> |

**Material #2**

**Title (255 characters maximum):**

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| Fox File |

**Summary (how does the material function in the lesson?):**

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**Downloadable file of this material in original format if possible, such as Microsoft word or PowerPoint (Provide filename and location)**

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| <http://www.nps.gov/badl/forteachers/classrooms/upload/SwiftFox3_FoxFilesStudentSheet.pdf> |

**Material #3**

**Title (255 characters maximum):**

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| Blank 2003 Swift Fox Translocation Chart Student Sheets |

**Summary (how does the material function in the lesson?):**

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**Downloadable file of this material in original format if possible, such as Microsoft word or PowerPoint (Provide filename and location)**

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| <http://www.nps.gov/badl/forteachers/classrooms/upload/SwiftFox3_BlankMasterSheet.pdf> |

**Material #4**

**Title (255 characters maximum):**

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| 2003 Swift Fox Teacher Key |

**Summary (how does the material function in the lesson?):**

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**Downloadable file of this material in original format if possible, such as Microsoft word or PowerPoint (Provide filename and location)**

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| <http://www.nps.gov/badl/forteachers/classrooms/upload/SwiftFox3_TeacherKey.pdf> |

**Material #5**

**Title (255 characters maximum):**

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| Teacher Background Information |

**Summary (how does the material function in the lesson?):**

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**Downloadable file of this material in original format if possible, such as Microsoft word or PowerPoint (Provide filename and location)**

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| <http://www.nps.gov/badl/forteachers/classrooms/upload/SwiftFox_TBI.pdf> |

**Assessment Materials**

**How can teachers tell that each individual student has met the objective? How will teachers see if each student knows the answer to the essential questions or has mastered the skills? Attach below the assessment and, if applicable, a rubric or answer key.**

**Assessment**

**Title (255 characters maximum):**

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**Summary (how does the material function in the lesson?):**

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| Exit Slip:  Ask students to choose one of the foxes that was assigned to them and write a paragraph describing the fox’s characteristics (i.e. gender, age, weight, capture location, capture date, and more) based on the data that they analyzed. |

**Downloadable file of this material in original format if possible, such as Microsoft word or PowerPoint (Provide filename and location)**

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**Assessment Rubric or Answer Key**

**Title (255 characters maximum):**

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**Summary (how does the material function in the lesson?):**

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**Downloadable file of this material in original format if possible, such as Microsoft word or PowerPoint (Provide filename and location)**

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**Supports for Struggling Learners**

**If a learner is struggling to understand the objective, essential question, or skills presented in the lesson, what can be done to help this learner? Is there a lower reading level version of text? Is there a more image heavy or simplified version of content? Can supportive devices be provided such as calculators?**

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| N/A |

**Extensions for Excelling Learners**

**If a learner is really excelling at the objective and skills presented in the lesson, what can be done to continue to challenge this learner? Can the student create a product or learn more in depth about the content?**

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| N/A |

**Additional Resources**

**Please list websites, references, or other materials for further research by interested students that is not already provided within the lesson.**

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| N/A |

**Related Lessons or Educational Materials**

**Is this lesson connected to other lessons within a unit? Is this lesson related to a field trip guide or activity? If so, list the website address or titled of these other materials below.**

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| --- |
| N/A |