eMammal: Close Readings on Predators,  
Invasive Species and Conservation

**Description**

Students will incorporate reading strategies into their scientific study of mammals by doing a series of close-reading exercises. Close reading involves multiple readings of the same text.

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**Objectives**

* Students will determine the central idea of an informational text.
* Students will track the central idea’s development over the course of an informational text.
* Students will provide an objective summary of an informational text.
* Students will use context clues to determine the technical meaning of words.

**Introduction**

You will incorporate literacy into the eMammal project by guiding students through a series of close-reading exercises. Close reading is a strategy to enable deep comprehension of complex text. For this lesson, you may choose from three texts of differing complexity. “Mongoose on the Loose” is the simplest. Use this text with young or developing readers. “Wildlife and the Land” has an average text complexity appropriate for middle-school learners. Use this with students who are currently reading on grade level. “The Return of Apex Predators” is highly complex. Use this with advanced classes or with individual students who are reading above grade level. The lesson requires multiple read-throughs of a single piece of text over consecutive class periods. Students will complete a different graphic organizer each time. Each read-through is done with a different purpose, preparing students to engage in meaningful conversation and profound comprehension. Besides increasing their understanding of the content, your students will benefit from the process itself.

**Real Science Application**

Human development activities usually have a negative effect on wildlife, yet there are many species that can thrive in altered ecosystems. Some species even seem to prefer such habitats. Besides adapting to human disturbances, mammal populations and interactions between species are changing. Some species that were overhunted are rebounding, while others have expanded their range as populations of top predators decline. For example, coyotes have moved eastward into habitats in which they have never lived. Populations are living close to and even within large cities. Scientists want to evaluate patterns of habitat use to guide the management and conservation of different mammal species. They also want to determine how potential conflicts between humans and wildlife might be avoided. To understand the impact of human development on mammal distributions, researchers need data from wildlife habitats that represent varying degrees of human use. The initial phase of eMammal studied the impacts of hunting on mammal populations. Volunteers placed cameras in parks and natural areas where hunting occurred and in areas where hunting did not occur. They also placed cameras along trails and away from trails to learn how mammals respond to trails and their use by humans.

eMammal researchers are now focusing on how the distribution of mammals changes from natural areas to human-dominated landscapes. Your students will be helping eMammal researchers answer important scientific questions, such as “How do animal communities change along a gradient from urban to wild areas?” and “How do different human activities affect wildlife in these areas?” By deploying camera traps on school grounds, students can help collect valuable data on mammal populations and movement in specific locations. Once students have identified all the animals in their photos and uploaded the images, one of the experts from the eMammal team will review them. The photos and data will appear in the eMammal database for researchers to use in current investigations.

**Time & Location**

For successful close reading, it is best to spread out the three readings over the course of a week or a unit. Budget 20 to 30 minutes for each read-through and accompanying exercise. The lesson can be done anywhere—take them outside, if possible.

**Teacher Materials**

* Camera trap images from your own cameras or from eMammal’s Web site: <https://emammal.si.edu/>
* Projector

**Student Materials**

* Copies of one of the following selected texts (one per student):
  + “Mongoose on the Loose,” Larry Luxner (Text1\_MongooseOnTheLoose.pdf);
  + “Wildlife and the Land,” N.C. Wildlife Resources Commission (Text2\_WildlifeAndTheLand.pdf); or
  + “The Return of Apex Predators,” Matthew Gompper (Text3\_ReturnOfApexPredators.pdf)
* Pencils and highlighters (one per student)
* Graphic organizers (one set per student):
  + CentralIdea.pdf
  + ParticularSentences.pdf
  + WordChoice.pdf
* *Optional*: Dump-and-Clump vocabulary cards (one set per 2-5 students) (DumpAndClumpVocabularyActivity.pdf)

**Safety**

None

**Student Prior Knowledge**

Students should have participated in eMammal Lesson 1, Camera Trap Stakeout (<http://studentsdiscover.org/teaching-modules/camera-trap-stakeout/>), which includes setting up cameras and working with photographs.

**Teacher Preparation**

* Be sure that you understand the process and purpose of close reading. An infographic for introducing yourself to close reading can be found at: <http://www.weareteachers.com/images/default-source/printables/pearson-literacy-teacher-infographic-close-reading--final-1-7-13.jpg?sfvrsn=4>.
* Print or display camera trap photos of the mammals that fit the text you have selected:
  + “Wildlife and the Land”: examples: camera trappers, anything caught in yards
  + “Mongoose on the Loose”: examples: nutria, armadillos, domestic cats, wild pigs
  + “The Return of Apex Predators”: examples: mountain lions, wolves, coyotes, people
* Make copies of the selected reading (one per student):
  + Text1\_MongooseOnTheLoose.pdf (lowest text complexity)
  + or Text2\_WildlifeAndTheLand.pdf (mid-level text complexity)
  + or Text3\_ReturnOfApexPredators.pdf (highest text complexity)
* Make copies of the three graphic organizers (one set per student)
  + CentralIdea.pdf
  + ParticularSentences.pdf
  + WordChoice.pdf
* *Optional*: Make copies of Dump-and-Clump vocabulary cards (one set per 2-5 students) and cut apart (DumpAndClumpVocabularyActivity.pdf)

**Activities**

|  |  |  |
| --- | --- | --- |
| “Mongoose on the Loose” | “Wildlife and the Land” | “The Return of Apex Predators” |
| Step 1: Do eMammal Lesson 1, Camera Trap Stakeout (camera set-up, species identification, etc.) <http://studentsdiscover.org/teaching-modules/camera-trap-stakeout/> | | |
| Step 2a:  Distribute or project photos of nutria, armadillos, domestic cats and wild boars. If you have not captured any of these species, use photos from the eMammal Web site. <http://emammal.si.edu> | Step 2a:  Distribute or project photos of camera trappers and any animals that might be caught in someone’s back yard. You may use photos from the eMammal Web site. <http://emammal.si.edu> | Step 2a:  Distribute or project photos of mountain lions, wolves, coyotes and people. You may use photos from the eMammal Web site. <http://emammal.si.edu> |
| Step 2b: Guide students in making connections between what they’ve done in the eMammal project already and what they’re about to do. Here are some good introductory questions: | | |
| 1. Who knows what “invasive” means? What connotation does that word have—positive or negative? Why? 2. What do you think it means for an animal to be called an “invasive species”? 3. Turn to the person next to you and both of you share your answer to this next question: What might be the eMammal scientists’ reaction when they see one of these invasive species on a camera trap for the first time? Did your answers differ? If so, in what ways? 4. In today’s text, you’ll be reading about an invasive species and how someone’s plan to introduce this species did not go well. Are there any questions before we begin? | 1. Turn to the person next to you and name as many animals as you can that you have seen in your yard. You have 30 seconds. Go! 2. What did your partner say? Did you name any of the same animals? If so, which ones? 3. Why might you want to make your yard an inviting place for animals? How might you accomplish this? 4. In today’s text, you’ll be reading an author’s perspective on how to be a good conservationist. Are there any questions before we begin? | 1. Has anyone seen any of these animals in real life? If so, which ones? Where? 2. [*Write on the board these words: berries, fox, mountain lion, mouse.*] Do you remember what a food chain is? With the students around you, sort these animals into a food chain. You have 30 seconds. Go! 3. Does anyone know what we call the mountain lion? *[It is a tertiary consumer or apex predator.]* 4. What might threaten apex predators? 5. What might happen if apex predators are removed from the food web? 6. What might happen if they are reintroduced? 7. In today’s text, you’ll be reading a complex scientific article on the return of apex predators to a certain ecosystem. Are there any questions before we begin? |
| Step 3: Distribute the selected article and first graphic organizer (CentralIdea.pdf).   * Do an aloud, whole-class reading of the article, stopping when you sense a need for clarification. This will allow students to develop fluency without anyone feeling singled out. * Next, model for students how to fill out the graphic organizer. Talk them through how to think about each question.   + *“What does it seem the author spends the most time on?”*   + *“What might be the biggest idea that the author wants us to walk away with?”*   + *“Let’s verbalize the central idea.”*   + *“What evidence in the text points me that way?”*   + *“Which details in the text most strongly point to that central idea?”* * Tell the students that they will be re-reading the text for deeper understanding during the next class meeting. | | |
| Step 4: On the second day, distribute the article again along with the second graphic organizer (ParticularSentences.pdf). Show the camera trap image with the tiny squirrel in the bottom corner (see bottom of last page). Describe how sometimes, just like with the squirrel in the photograph, it is difficult to see the details. Tell them it is important to look carefully and deeply at the sentences that make up a text. To gain the most understanding, readers must analyze the details of a text.   * Tell students that their task today is to identify specific sentences that have the biggest role in creating the central idea they previously identified. Students should fill out the graphic organizer. * Make a judgment call: Are students ready to read on their own? Do you need them to read in partners or small groups? How about doing another whole-class read-aloud or divide up the text but still read it aloud? **Repeating the reading of a text increases reading fluency, comprehension and analysis.** * Have students work in pairs to identify the three sentences that most significantly propel the development of the central idea. * Let students know that they will read the text one more time during the next class. | | |
| Step 5: On the third day, distribute the article again along with the third graphic organizer (WordChoice.pdf).   * Ask a student to share a story about a friend or family member. **Pay close attention to the specific words they use in their storytelling.** When the student finishes the story, ask specifically about some words and why they were chosen. Explain that all people use words intentionally in their writing. Tell them they will be looking at some distinct words. * Have students read the article independently. After finishing the article, they should identify the top five most important words in the article. Have them select one of their top five to fill out the graphic organizer. * *Optional*: If time allows, have students complete the Dump-and-Clump vocabulary activity (DumpAndClumpVocabularyActivity.pdf). | | |
| Step 6: Debrief.   * Ask the following questions (and any others that seem appropriate):   + How much more do you understand the text now compared to when you first read it?   + Could you participate in a big discussion on this topic somewhere other than this class? Where might you do this?   + Why might students think they can read something only once? | | |

**Extension Activities**

None

**Assessment**

Assess comprehension using the graphic organizers and students’ responses. Can students, by participating in close reading, analyze various levels of scientific texts?

* + Reading 1: Can the student identify the central idea, track its development and provide supporting details from the text?
  + Reading 2: Can the student analyze the role of particular sentences in developing and refining a key concept?
  + Reading 3: Can the student determine the meaning of words or phrases in a text and analyze the specific word choice?

**Community Engagement**

* Invite parents and/or other community members to help set up or retrieve camera traps.
* Invite someone from the community who spends a lot of time outdoors or working with land (hunters, anglers, campers, farmers, etc.) to discuss their experiences.

**Critical Vocabulary**

|  |  |  |
| --- | --- | --- |
| “Mongoose on the Loose” | “Wildlife and the Land” | “The Return of Apex Predators”\* |
| **Endangered species:** groups of animals in danger of becoming extinct  **Epidemic:** occurrence in which a large number of animals or people have a certain disease at the same time  **Extinct:** a species that no longer exists  **Invasive species**: groups of plants or animals that are not native to an area but have been introduced, usually as a result of human behavior; these typically threaten the current ecosystem in some way.  **Predator:** an animal that kills and eats other animals | **Commission**: a group of people officially charged with a particular function  **Conservation**: the act of preserving, guarding or protecting natural areas or species  **Fruit**: result or reward of work or activity  **Implement**: to put into effect  **Philosophy**: a particular system of thought | **Apex predator**: the animal that presides at the top of the food chain; an animal that has no predators but only prey  **Ecologist**: a scientist who studies how plants and animals interact with their environment  **Faunal**: of or pertaining to animals  **Ozarks**: a highland region in the central United States covering parts of Missouri, Arkansas, Kansas and Oklahoma; the most mountainous region between the Appalachians and the Rockies, although the region is technically a high and deeply dissected plateau  **Transient**: lasting for only a short time; impermanent  \* You may wish to define other high-level words. Read through the text to determine which words you might want to front-load and which words your students can figure out using context clues. |

The terms in blue are the focus of that article.

**Modifications**

There are three levels of text complexity to use within the lesson.

**Alternative Assessments**

None

**References**

None

**Supplemental Information**

None

**Comments**

None

**Curriculum Alignment**

Common Core Standards

CCSS.ELA-LITERACY.RI.8.2 — Determine a central idea of a text and analyze its development over the course of the text, including its relationship to supporting ideas; provide an objective summary of the text.

CCSS.ELA-LITERACY.RI.8.4 — Determine the meaning of words and phrases as they are used in a text, including figurative, connotative and technical meanings; analyze the impact of specific word choices on meaning and tone, including analogies or allusions to other texts.

CCSS.ELA-LITERACY.RI.8.5 — Analyze in detail the structure of a specific paragraph in a text, including the role of particular sentences in developing and refining a key concept.

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