Unit 1/Week 3

Title: The Case of the Monkeys that fell from the Trees

Suggested Time: 5 days (45 minutes per day)

Common Core ELA Standards: RI.6.1, RI.6.2, RI.6.3, RI.6.7; W.6.2, W.6.4, W.6.9, W.6.10; SL.6.1, SL.6.4, SL.6.5, SL.6.6; L.6.1, L.6.2

Teacher Instructions

**Preparing for Teaching**

1. Read the Big Ideas and Key Understandings and the Synopsis. Please do **not** read this to the students. This is a description for teachers about the big ideas and key understanding that students should take away **after** completing this task.

Big Ideas and Key Understandings

 In the world of science, the solution to a problem must be discovered methodically and systematically. From this study, new information can be discovered.

Synopsis

 This article describes scientists Ken and Molly Glander’s research on the eating habits of howler monkeys in Costa Rica. In 1972, several howlers abruptly fell from the trees and died for no apparent reason. The Glanders became intrigued, suspecting that the monkeys had been poisoned. After a year of careful observation and detailed note taking, the scientists concluded that the monkeys fell because they had eaten poisonous leaves. Their research revealed important information about the howler’s eating habits and provided valuable information for scientists searching for new medicines.

1. Read the entire selection, keeping in mind the Big Ideas and Key Understandings.
2. Re-read the text while noting the stopping points for the Text Dependent Questions and teaching Tier II/academic vocabulary.

**During Teaching**

1. Students read the entire selection independently.
2. Teacher reads the text aloud while students follow along or students take turns reading aloud to each other. Depending on the text length and student need, the teacher may choose to read the full text or a passage aloud. For a particularly complex text, the teacher may choose to reverse the order of steps 1 and 2.
3. Students and teacher re-read the text while stopping to respond to and discuss the questions, continually returning to the text. A variety of methods can be used to structure the reading and discussion (i.e., whole class discussion, think-pair-share, independent written response, group work, etc.)

Text Dependent Questions

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| **Text-dependent Questions** | **Evidence-based Answers** |
| What are the “incidents” to which the article refers? | The article refers to “the incidents” which were, when over a two-week period, seven monkeys from various troops in the area fell out of trees and died. Another one fell out of the tree, but, was able to climb back up. This monkey did not eat for twenty-four hours. These events or incidents lead the Glanders to investigate what is causing the howlers to fall from the trees. |
| Why is it unusual that the monkeys were falling? | It is unusual that the monkeys were falling, because according to the text, the monkeys “…are skilled, nimble climbers. They often leap ten feet or more between tree limbs, and they almost never fall.” |
| What did Glander think it might be due to, and what did he ask scientists to do?  | According to the text, “Glander wondered if a disease or parasite might be involved. He asked scientists in the microbiology department at the University of Costa Rica to examine some of the dead monkeys and look for clues.”  |
| What was the result of their findings? | Based on details from the text, “The scientists found no signs of disease or parasites. Nor had the monkeys starved.”  |
| What did Glander begin to think happened to the monkeys? | The text states, Glander “began to think they had been poisoned.”  |
| Why did it seem unlikely that plants were the cause of the monkey's death?  | Using evidence from the text, It seemed unlikely that plants caused the monkeys death because “All plants produce chemicals called secondary compounds, many of which are poisonous…But howling monkeys eat nothing except plants, so they could not survive unless they were able to digest or tolerate plant poisons.”  |
| What are some of the Glander’s traits as scientist? Support each trait with evidence from the text?  | Observant: “One morning in the Glanders watched a female howling monkey with….”Curious: “Glander wondered if a disease or parasite….”Resourceful: “He asked scientists in the microbiology….” |
| As a result, Glander believed that certain trees were “monkey killers.” What were Glander’s next moves?  | Based on evidence, for twelve months, the Glanders observed the monkeys by following them, collecting samples of the leaves they had eaten, tagged the leaves, and dried the leaves the monkeys had eaten to study them later.  |
| What did the Glanders note about the monkeys’ eating habits?  | It states, “…the howlers ate new leaves whenever they could, only occasionally eating fruits, flowers or mature leaves. In certain trees, the monkeys plucked off the leaves, then stripped and tossed way the leave blades. They ate only the remaining leave blades.  |
| Some scientists thought that the monkeys had this “messy eating habit” because of the abundance of food, but “Glander wasn’t convinced.” Why? | According to the text, Glander studied which leaves the howler monkeys ate. “…instead of being sloppy eaters…howling monkeys are cautious, picky eaters in a forest filled with poisons.” |
| Why was Glander still confused by this data?  | According to the text, “If howling monkeys can identify and avoid the most toxic leaves, why would they ever become poisoned and fall?”  |
| Using his field notes, according to Glander, how did the monkeys determine which leaves were poisonous and not poisonous?  |  “A solitary adult monkey visited the tree briefly, ate just a little bit, and then moved on. Glander thinks these monkeys were sampling the leaves for poisons…He suspects that each monkey troop finds out which trees throughout the area. By using this technique, the monkeys would avoid eating too many of the most toxic plant poisons.”  |
| How does Glander think that the monkeys fell from the trees?  | According to Glander, “Considering the ever-changing toxicity of the leaves in a forest….Individual monkeys may sometimes make mistakes. They may eat too many of the wrong leaves. More importantly, when edible leaves are scarce due to unusual conditions, monkeys may be forced to eat leaves they wouldn’t otherwise choose.” It states, “Glander is convinced that the falling monkeys he and Molly observed were poisoned by eating leaves from the wrong trees at the wrong time.” |
| What new information has been discovered due to studying the monkeys that fell from the trees?  | Two facts can be found: 1. “Poison chemicals (found in the trees) used in small amounts often have medicinal value. 2. Howlers and other monkeys sometimes select poisonous leaves for medicinal purposes…Glander thinks scientists searching for new medicines for people might get some useful tips from howlers.”  |
| What is one main trait required in order to be an effective scientist? Support your conclusion with evidence from the text? | Answers may vary but must be supported by evidence from the text. Sample answer: An effective scientist must be curious and question what seems to be obvious by others. For example, the Glanders “watched” these unusual habits of falling monkeys. The pondered on several reasons: disease or parasite, poisonous leaves, but wasn’t convinced by the obvious. |

Tier II/Academic Vocabulary

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|  | **These words require less time to learn**(They are concrete or describe an object/event/process/characteristic that is familiar to students) | **These words require more time to learn**(They are abstract, have multiple meanings, are a part of a word family, or are likely to appear again in future texts) |
| **Meaning can be learned from context** | troopabruptlymicrobiologysuspended drapingendureddatastartlingcautious analysestoxicityscarcemedicinal  | incidentsnimbleexamine distressscarcesilver lining |
| **Meaning needs to be provided** | alternatingfield workrevealeddigestibleanalysesuniform  | compoundsmicrobiologydiseaseparasiteconditionssuspectsspeciesconcentrationproduce  |

Culminating Writing Task

* Prompt

*Susan Quinlan’s article “The Case of the Monkeys That Fell From the Trees,” follows the scientists Molly and Ken Glander while they try to determine why howler monkeys have fallen from the trees in the rainforest and died. The case of scientific inquiry requires that one develop a hypothesis and go about proving or disproving this hypothesis. Often, new information is discovered.*

*Think about the hypothesis that the Glanders developed, and the various steps they took to prove their hypothesis. Write a paper which explains this hypothesis and the various steps they took. Was there any new information discovered?*

* Teacher Instructions
1. Students identify their writing task from the prompt provided.
2. Students complete an evidence chart as a pre-writing activity. Teachers should guide students in gathering and using any relevant notes they compiled while reading and answering the text-dependent questions earlier. Some students will need a good deal of help gathering this evidence, especially when this process is new and/or the text is challenging!

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| ***Evidence******Quote or paraphrase*** | ***Elaboration / explanation of how this evidence supports ideas or argument*** |
| “…Over a two-week period, seven monkeys from various troops in the area fell out of the trees and died. Another fell but climbed back up.”  | The problem of monkeys falling from trees and dying occurs in the forest of Costa Rica at the beginning of the article.  |
| Monkeys “…often leap ten feet or more between tree limbs, and they almost never fall.” | This explains why it is unusual that the monkeys have fallen. |
| “Glander wondered if a disease or parasite might be involved. He asked scientists in the microbiology department at the University of Costa Rica to examine some of the dead monkeys and look for clues.”“The scientists found no signs of disease or parasites. Nor had the monkeys starved.” | This is Glander’s original hypothesis and how it was disproved. |
| Glander “began to think they had been poisoned.” | This demonstrates how Glanders hypothesis changes. |
| “It seemed unlikely that pants caused the monkeys death because “All plants produce chemicals called secondary compounds, many of which are poisonous…But howling monkeys eat nothing except plants, so they could not survive unless they were able to digest or tolerate poisons.” | It seems unlikely that plants were the cause of the monkey’s death. |
| The Glanders observed the monkeys by following them, collecting samples of the leaves they had eaten, tagged the leaves and dried the leaves the monkeys had eaten to study them later. | The Glanders followed and observed the monkeys for 12 months. |
| “…the howlers ate new leaves whenever they could, only occasionally eating fruits, flowers or mature leaves. In certain trees, he monkeys plucked off the leaves then stripped and tossed away the leave blades. They ate only the remaining leave blades.” | Observations which prove their hypothesis that the monkeys had been poisoned. To some scientists this proved that the monkeys were messy eaters. |
| Glander questioned, ”If howling monkeys can identify and avoid the most toxic leaves, why would they ever become poisoned after all?  | Glander was not convinced with this explanation. Grapples with the data. |
| “A solitary adult monkey visited the tree briefly, ate just a little bit, and then moved on. Glander thinks these monkeys were sampling the leaves for poisons…He suspects that each monkey troop finds out which trees throughout the area. By using this technique, the monkeys would avoid eating too many of the most toxic plant poisons.”  | Glander uses his field notes/data collection to draw a conclusion of how the monkeys determined which leaves were poisonous and not poisonous. |
| According to Glander, “Considering the ever-changing toxicity of the leaves in a forest….Individual monkeys may sometimes make mistakes. They may eat too many of the wrong leaves. More importantly, when edible leaves are scarce due to unusual conditions, monkeys may be forced to eat leaves they wouldn’t otherwise choose.” It states, “Glander is convinced that the falling monkeys he and Molly observed were poisoned by eating leaves from the wrong trees at the wrong time.” | Glanders ultimate conclusion of how the monkeys fell from the trees. |
| Two facts can be found: 1. “Poison chemicals (found in the trees) used in small amounts often have medicinal value. 2. Howlers and other monkeys sometimes select poisonous leaves for medicinal purposes…Glander thinks scientists searching for new medicines for people might get some useful tips from howlers.”  | New information has been discovered due to studying the monkeys that fell from the trees. |

1. Once students have completed the evidence chart, they should look back at the writing prompt in order to remind themselves what kind of response they are writing (i.e. expository, analytical, argumentative) and think about the evidence they found. (Depending on the grade level, teachers may want to review students’ evidence charts in some way to ensure accuracy.) From here, students should develop a specific thesis statement. This could be done independently, with a partner, small group, or the entire class. Consider directing students to the following sites to learn more about thesis statements: http://owl.english.purdue.edu/owl/resource/545/01/

 http://www.indiana.edu/~wts/pamphlets/thesis\_statement.html.

1. Students compose a rough draft. With regard to grade level and student ability, teachers should decide how much scaffolding they will provide during this process (i.e. modeling, showing example pieces, sharing work as students go).
2. Students complete final draft.
* Sample Answer

 Susan Quinlan’s article “The Case of the Monkeys that Fell From the Trees” follows the scientists Molly and Ken Glander while they try to determine why howler monkeys have fallen from the trees in the rainforest and died. This paper will elaborate on how the Glanders developed a hypothesis, studied the monkeys and used their data to draw a conclusion on why the monkeys fell from the trees, and, interestingly enough, how new information was gathered.

 In the beginning of the article, monkeys had fallen to their death in the Costa Rican rainforest. According to the text, “…Over a two-week period, seven monkeys from various troops in the area fell out of the trees and died. Another fell, but climbed back up. ” Glander’s original hypothesis was whether “…a parasite might be involved,” and he “…asked scientists in the microbiology department at the University of Costa Rica to examine some of the dead monkeys and look for clues. It turned out that there were no signs of parasites.

 Glander’s hypothesis continued to challenge him because it seems unlikely that plants could be the cause of the monkey’s death. According to the text, “All plants produce chemicals called secondary compounds, many of which are poisonous…But howling monkeys eat nothing except plants, so they could not survive unless they were able to digest or tolerate poisons.” (79-80)” So, it was up to the Glanders to observe the monkeys. They followed the monkeys for twelve months. “The Glanders observed the monkeys by following them, collecting samples of the leaves they had eaten, tagged the leaves and dried the leaves the monkeys had eaten to study them later.” There began to be evidence that the monkeys were poisoned: “The howlers ate new leaves whenever they could, only occasionally eating fruits, flowers or mature leaves then stripped and tossed away the leave blades. They ate only the remaining leave blades.” Glander continued to grapple with the data. He asked, “If howling monkeys can identify and avoid the most toxic leaves, why would they ever become poisoned after all?” Glander uses his field notes to draw a conclusion to how the monkeys determine which leaves were poisonous and not poisonous. “A solitary adult monkey visited the tree briefly, ate just a little bit, and then moved on. Glander thinks these monkeys were sampling the leaves for poisons…He suspects that each monkey troop finds out which trees throughout the area. By using this technique, the monkeys would avoid eating too many of the most toxic plant poisons.” Finally, Glander came to a conclusion: “Considering the ever changing toxicity of the leaves in a forest…Individual monkeys may sometimes make mistakes. They mat eat too many of the wrong leaves. More importantly, when edible leaves are scarce due to unusual conditions, monkeys may be forced to eat leaves they wouldn’t otherwise choose.” Furthermore, it states, ‘Glander is convinced that the falling monkeys he and Molly observed were poisoned by eating leaves from the wrong trees at the wrong time. ”

 Not only did Glander redevelop his hypothesis and conduct research on the howler monkeys, but new information was also discovered. First, “poison chemicals that have been found in trees used in small amounts often have medicinal value. Lastly, “howlers and other monkeys sometimes select poisonous leaves for medicinal purposes…Glander thinks scientists searching for new medicines for people might get some useful tips from howlers.”

 The scientific method is an amazing process. As can be seen with the Glanders, they were able to discover the answer to why the monkeys fell from the trees as well as find new information on the medicinal benefits from poisonous trees.

Additional Tasks

* The Glanders studied the howling monkeys in the Costa Rican rainforest. There is a diagram of the living layers of the rainforest. Choose an animal from the rainforest. Write a three to four page paper on that animal. Include the following information: Name of the animal? Description of the animal? The animal as a baby, adolescent and adult? Predators? Specific habitat and diet of the animal? Any challenges faced in this habitat? What problems does the encroachment of man play on this animal’s future? Have there been any notable studies on this animal? Elaborate. Lastly, create a poster like the one in the text including which layer of the rainforest one can find this animal as well as interactions with other animals in this specific layer? Be sure to include a written description of your poster in your essay.
	+ Answer: The student should have a written essay along with a poster which serves as a visual aid. Possible animals: Macow, Columbus Monkey, Tree Frog, Toucan, or Tarantula. The student should gather their information from the internet as well as the library.

Note to Teacher

* To facilitate class discussion, you may wish to create a list of the animals from the Costa Rican rainforest from which student may choose their animal. This will stop repetition.