The Takhi: How Humans Have Both Harmed and Helped an Endangered Species

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Introduction

As a DTI fellow I have been attending weekly seminars where I have been discussing human population growth and its impact on water, organisms and climate change. This experience has opened my eyes and has brought me to the realization that I have a major responsibility as a teacher to educate every student, every year about the importance of conserving natural recourses and wildlife. I think it is imperative that children understand the effect that humankind has on the world. I want them to understand the damage we are causing but also their ability to cause positive change and help conserve natural recourses and wildlife.

Demographics

Red Clay Consolidated School Districted is located in New Castle County, Delaware. Red Clay consists of 28 schools in both urban and suburban settings. Red Clay has over 18,000 students. Of those students, 22% are African American, 6% are Asian, 24% are Hispanic, and 46% are White. Red Clay provides 11% of students with Special Education, and almost 11% of students with English Language support. In addition, 41% of students come from low income families.

Highlands Elementary is a small, urban school in the City of Wilmington. We service on average about 360 students in grades K-5. Minority populations make up 89% of our student body, and 86% of our students come from families with a low socio-economic status. I am a first grade teacher with a class size that varies between 18-24 students.

Rationale

"For thousands of years, humankind has viewed wilderness as both infinite and hostile; we entered natural creation as if stepping onto a battlefield."[1] The human population has always had an effect on the environment and species around them. This is true now, more than ever. Humans are responsible for creating and destroying various animal habitats and animal populations. I believe that children need to be taught from a young age how they are responsible for the organisms and environment around them. Children need to understand that humans play a major role in the populations, environment and habitat of various organisms. Humans can both positively and negatively affect the ecosystem that surrounds them.

First grade students are always very enthusiastic about science class and seem to always agree that science is their favorite subject. They have a natural curiosity about the world around them, which I think contributes to their love for science. I use the Smithsonian Science Curriculum along with supplemental material as tools to implement science into my classroom. Students are always so excited to participate in experiments, observations and research. One of the Smithsonian Science Units is a unit on organisms. Throughout the unit, they observe and explore various plants and animals in and out of their natural habitats. The students learn that organisms are living things and therefore require certain things to thrive such as food, water, shelter and space. Students observe, discuss and compare the different plants, animals and habitats. I also use Scott Foresman as my language arts curriculum which integrates the study of animals through the use of various texts.

The unit I am writing is going to be implemented to enhance the first grade organisms unit. I am going to focus on one animal species, Takhi, also known as Przewalski's horse. The overall goal of my unit is to have students understand the effect of people on animals and also how different animal populations and species affect each other as well with an emphasis on endangered species.

Takhi

Przewalski's horse (Equus ferus przewalskii) or takhi which means "spirit" in Mongolian, are wild horses originally found from Germany, Russian, Kazakhstan, Mongolia and northern China. Takhi are the only true wild horses. Wild horses in Australia and North America are actually descended from domesticated horses. Takhi are compact horses with heavy limbs and strong necks. Takhi have a dun coat with white stains around their noses and thin, dark stripes that run from their mane to their tale. Takhi are different from domestic horses but are very closely related. Takhi have short, erect manes where domestic horses have long, falling manes. Takhi have short guard hairs on their tail, domestic horses have long guard hairs all over their tails. Unlike domestic horses, takhi shed their tail and mane hair once a year. [2]

There is documentation that takhi-type horses existed more than 20,000 years ago. There have been discoveries of European caves with paintings and engravings of wild horses from 20,000 to 9,000 BC. The first written account of these horses was in 900 AD by a Tibetan monk, Bodowa.[2] However, the wild horses were unknown in the West until the 1720's when a Scottish doctor who was serving in the military discovered them near the Chinese-Mongolian border. Then, in the 1880's, an explorer, Colonel Nikolai Mikailovich Przewalski found a skull and hide of a takhi on the Chinese-Russian border. He took them to a Zoological Museum of the Academy of Science in Saint Petersburg where I.S. Poliakov studied them and concluded that they were a wild horse and he officially named them *Equus przewalskii*.

Takhi live in family groups called harems which are made up of no more than 10 horses. They consist of a dominant stallion and a group of mares and foals. The stallion is in charge of protecting his family from enemies and he is the only male who gets to mate with the females. Mares give birth to one foal a spring and the foal stays with its mother for about two years. Foals are able to run shortly after they are born. They nurse from their mothers but they are also able to find and nibble food on their own as well.

These wild horses originally inhabited steppe land, which is defined as a large, flat area of land with grass and very few trees. Steppe lands are typically found in Europe and Asia. Takhi were also found inhabiting semi-desert terrain as well, but it is unknown whether they naturally inhabited that land or if they were forced to migrate in an attempt to survive and find food.

The takhi population began to decline for several known reasons. European hunters started killing and collecting them. Then, people began inhabiting the Mongolian Steppe. Herdsmen brought along with them sheep, cattle and other livestock. The sheep and cattle ate the grass that the takhi needed to survive. The takhi faced other big problems as well, including disease and some unusually harsh winters. All of these conditions combined put the takhi in great danger for survival. It is thought that they migrated towards the semi-desert terrain as a last effort towards survival. Over the years, the takhi population significantly decreased, with the last of the wild takhi dying by 1970. The species was then classified as Extinct in the Wild on the IUCN Red List of Threatened Species.

After the takhi were extinct from the wild, the species survived only in captivity due to the breeding of 13 captive takhi.[3] Various conservation groups, zoos and breeders worked to breed the captive takhi. This effort to breed them was not easy. The takhi struggled at first to survive in captivity. Because many of the few horses were genetically related, it was difficult to avoid interbreeding. However, by the mid 1980's over a 1,000 takhi lived in captivity.[3]

In 1990, efforts towards reintroduction of the takhi into the wild began. The takhi were the first species to ever be reintroduced into the wild after so long in captivity. According to Michael Stuwe, a research associate with Smithsonian Institute, "Breeding animals in captivity almost always results in the offspring being adapted to life in captivity in some way or another".[3] Because of this, plenty of scientific data and research had to be firmly integrated into the process of reintroduction. Scientists had to closely monitor the horses, their habitat and their ability to reproduce after they were reintroduced to the wild. Conservationists and scientists started the process of reintroduction by establishing herds of takhi on "semi-reserves" of about 12 acres of land in the Netherlands and Germany. On the semi-reserves the herds learned to find their own food and eventually thrived and reproduced. After the success of the semi-reserves,

international efforts began to find sites suitable for the reintroduction of the horses into the wild. The sites needed to provide a constant supply of water, food and shelter that mimicked their natural habitat. The site needed to be void of domestic livestock and horses but could allow the presence of indigenous grazers and predators to create a healthy eco-system. Most conservationists and scientists agreed that placing the takhi back into their natural habitat where they were last seen in the wild was ideal. Since the start of the planning of reintroduction began, projects have been established in Mongolia, China and the Ukraine. Initially, the takhi were released into a reserve, a fenced in area in Mongolia, The Takhin/Tal Gobi B reintroduction site. There, scientists could monitor them and allow them to slowly acclimate to the wild. Soon after the horses were reintroduced into the reserve, the takhi faced some very serious challenges. Weather conditions in central Asia tend to be extreme. Summers are very hot and winters are very cold. In the summer temperatures can reach up to 104 degrees Fahrenheit and in the winter the temperature can drop to -45 degrees Fahrenheit, bringing along some very serious ice and sleet storms as well. Extreme weather conditions created some serious problems for the newly wild tahki. The horses were competing for scarce food and water in their fenced in area and a number of them died. In addition to the harsh weather, a tick-borne disease, a broken dam across a nearby stream, and foals falling prey to wolves caused several casualties to the tahki. After this first reintroduction effort, scientists decided they needed to only select the healthiest horses and they also began to provide hay and pellets as food between the winter months of October and April. They also provided water during extreme droughts in the summer. These actions have promoted reproduction and survival of the takhi on the reservation. There are now three reservation and reintroduction sites around the world.

In 1997, takhi from the reservation started to be released into the wild, no longer receiving help from scientists. According to an article published by the American Museum of Natural History, as of 2007, 115 takhi were roaming free in the Dzugarian Gobi, including 76 that were born in the wild.[3] Chris Welzer claims that "today the Mongolian population consists of some 350 wild individuals and the species was down listed to Critically Endangered in 2008 and Endangered in 2011".[3]

Teaching Strategies

Close Reading

I will use non-fiction read alouds to relay scientific facts and information to my class. Throughout each read aloud I will stop and ask retell and comprehension questions to ensure student learning and promote good reading strategies.

Turn and Talk

During whole group instruction students will turn and talk to their seat partner to discuss answers to questions. This encourages participation from everyone and insures that all students are engaged. Turn and talks allow me to hear answers from various students as opposed to calling on just one or two.

Cooperative Group Work

Students will work in cooperative learning groups throughout this unit. Students will work together to create products, discuss topics, and conduct research together.

Classroom Activities

Part 1- Introduction to Organisms, Ecosystems and Endangered/Extinct Species

Objectives:

1. Identify the differences between living and non-living things. Identify the needs and qualifications of living things.
2. Define habitat. Determine which organisms share habitats and live and work together to thrive.
3. Define ecosystem. Determine that living things are all part of ecosystems in which they live and thrive.
4. Determine what it means to be an endangered species versus an extinct species and explore several examples of each.
5. Identify the ways in which humans impact other living things specifically endangered and extinct species.

Vocabulary:

Organism- living things that need food, water, air, space. Organisms can reproduce and move on their own.

Ecosystem- An ecosystem is a community of living and non-living things that live and work together.

Habitat- A habitat is the natural home or environment of an animal, plant or other organism.

Endangered species- An endangered species is a species of animal or plant that is in serious risk of extinction.

Extinct- Extinct means having no living members of a species; no longer exists.

Lesson 1

Introduction: In whole group, students will brainstorm things that are alive or living. After students have thought about examples of things that are alive, they will then describe things those things. I will record their responses on chart paper that is labeled *Living Things.* Students will then do the same for non-living things, provide examples of non-living things and then describe them as I record their ideas on a chart labeled *Non-living.*

Whole Group Instruction: Students will watch the video *Living and Non-Living* on TeacherTube. The video explores various examples of living and non-living things and discusses what classifies each. This video teaches students what it means to be living. Students will also learn what all living things require to thrive.

Activity: Students will cut, glue and sort living and non-living things. To assess student learning, I will have students share their work after completion and explain why they sorted the things the way they did. I will ask questions such as, "What makes the cow living? How do you know the teddy bear is non-living?"

Lesson 2

Introduction: Students will turn and talk to their partner to answer the question, "What do you know about animal habitats?" This will encourage students to access their prior knowledge about animal homes and habitats. We will then have a class discussion about habitats. I will explain that a habitat is where animals live and work together with other animals, plants and non-living things to survive. I will then ask them to turn and talk about different examples of habitats they know about. I will look for students to talk about deserts, oceans and forests as this reflects their prior knowledge in first grade.

Instruction: I will read three non-fiction texts to the class. Each text covers a different habitat. I will not read each book completely. I will talk about effective ways to do research using non-fiction texts. Together we will choose the topics we find most important in each text and read only those sections. As I read I will stop throughout and ask close reading questions. Students will also be asked several pre-reading questions and post reading questions. The texts include *Oceans, Temperate Forests,* and *Deserts,* all written by Greg Reid.

Activity: Students will work in pairs to complete the habitat work pages. Three groups will share their work so each habitat will be discussed and reviewed in whole group. Students will be expected to explain their thinking and discuss their habitat with the class.

Lesson 3

Introduction: Students will turn and talk to their partner to answer the question, "How do plants and animals work together in their habitat to survive?" Students will brainstorm about communities of animals and plants in particular habitats and how they need each other. I predict that most students will talk about how animals eat plants, insects and animals spread seeds to help plants reproduce and animals use trees for shelter.

Instruction: I will read *Why Beavers Love Wolves* and ask students close reading questions as we go. This non-fiction text explains how wolves, beavers and elk all work together to make the ecosystem of Yellowstone Park work. It shows how the wolves positively affect the entire ecosystem, but I will focus student attention on the fact that an ecosystem can be large or small and all the living and non-living things that exist in an ecosystem depend on one another for survival. Students will understand that if one thing is removed from an ecosystem, the whole ecosystem changes. At this point I think it is important for students to understand the difference between a habitat and an ecosystem. I will ask students to provide examples of habitats that we discussed the previous day. I will use the examples and the work pages from the previous day to explain that a habitat, is just the place where plants and animals live and the ecosystem is all of the living and non-living things surrounding that habitat. In other words, the habitat is a subset of the ecosystem. I will display each habitat work page, with the images of the animals that didn't belong removed, on the SMARTboard. We will discuss how the sun affects the plants in each one, how the plants affect the animals, and how each animal affects each other. I will want students to determine that in the ocean habitat, the sun heats the water and keeps the water at a certain temperature. The shark eats the fish that eat the plants, etc. I will do the same thing for each habitat that we previously discussed.

Activity: Journal – I will ask my students to think about the wolves of Yellowstone and what happened to the other animals of Yellowstone after the wolves were removed. They will then write about what they think would happen if sharks were taken out of the ocean. How would the other animals and plants be affected?

Lesson 4

Introduction: Students will turn and talk their partner about whether they think some animals could possibly completely die off. I will guide them with an example such as, "Do you think it is possible for there to someday be no dogs or cats left on earth?" I will instruct them to tell their partner their stance, yes or no, and why or why not. I will guide student discussion towards the fact that sometimes animals do completely die off and they no longer exist. I will ask for an example of an animal that they know of that this has happened to. I predict that students will begin talking about dinosaurs. I will then introduce the word extinct. I will use dinosaurs as an example of an extinct animal and

provide them with the definition. I will then start to explain that when an animal is not extinct yet but has so few of them left, they are considered endangered.

Instruction: Students will watch *Exploring the Diversity of Life: Act with the Facts*. I will stop the video throughout to ask questions to ensure understanding and to initiate discussion. Students will learn the definitions of extinct and endangered species. Students will learn the reasons for animal endangerment and how humans are negatively impacting animal species. I will also read, *Will We Miss Them? Endangered Species.* As I read, I will prompt conversation about why it is so important for people to help endangered species.

Activity 1: Students will work in groups of four or five to briefly research an endangered species using on level non-fiction texts and the internet. I will provide a list of endangered species and each group will pick one to research. Students will be instructed to choose a species, find out why they are endangered, what habitat they live in and what other plants and animals are in their ecosystem. After each group has done their research, they will share their information with the class.

Activity 2: Students will turn and talk about how people could possibly help their endangered species. Students will then be asked to individually write a persuasive letter encouraging and persuading people to help save endangered species. This activity, through providing evidence as to why and how humans should help endangered species, will guide my students towards thinking about why animals are so important and why it is so important for humans to make sure that endangered species do not go extinct.

Part 2: The Takhi

Objectives:

1. Compare and contrast takhi and domesticated horses.
2. Describe aspects of steppe habitat.
3. Identify plants and animals that are part of the takhi's ecosystem.
4. Identify how people contributed to the extinction of takhi in the wild as well as other factors that affected takhi.
5. Identify how people have helped takhi.

Vocabulary:

Steppe- A steppe is a large, flat area of land with grass and very few trees. Found in Eastern Europe and Asia.

Tame- Tame animals are animals that are trained and cared for by people.

Wild- Wild animals are animals that live in nature without human control or care.

Lesson 1

Introduction: Now that I have covered different habitats, ecosystems and endangered species we are going to study one very interesting endangered species. I will have my students turn and talk about what they know about horses. Students will likely talk about how people ride horses, horses live on farms, horses eat grass and carrots. I will guide our class discussion towards the fact that they are talking about tame horses, horses that people take care of. I will introduce them to the fact that some horses are wild, which means people do not take care of them.

Instruction: I will project a picture of a wild horse, a takhi, next to a picture of a tame horse. As a class we will discuss their physical attributes and how they are alike and different. I will then introduce a steppe. I will show students the video *Arid Lands of Asia: Mongolia and The Takhi Horses.* This video will give students a visual of takhi and the steppe in which they inhabit. After we watch the video of the steppe, I will read *Grasslands* by Greg Reid. This text will give students a better idea of a steppe habitat since steppe is a type of grassland. We will discuss what they think the takhi eat, knowing that the steppe is their habitat. I will guide students toward the understanding that takhi eat grass in the wild.

Activity 1: Students will independently complete a Venn diagram to compare and contrast takhi and domesticated or tame horses. I will guide students towards identifying their physical differences, differences in habitat and that takhi are wild and domesticated horses are tame. However, they both eat grass, they're both horses, they both need water, they're both living things, etc.

Activity 2: Students will work in a group to use art supplies and create a shoe box display of a steppe habitat. Their display will show takhi and other animals in their ecosystem. Students will be instructed to include everything that the takhi need for survival in their display.

Lesson 2

Introduction: I will instruct students to turn and talk to their partner about what they already know about takhi horses. This will serve as a warm up and to encourage students to recall what they learned about takhi in the previous lesson.

Instruction: I will read *Takhi* by Karen Mafnuson Beil. This read aloud is a short, non-fiction read aloud written to give children facts and information regarding the extinction and reintroduction of the takhi in the wild. It focuses on how people helped the takhi to reproduce in captivity and eventually reintroduced into the wild. As I read the text I will ask comprehension and close read questions to ensure student understanding. I will guide a whole group discussion about how the takhi went extinct in their natural habitat and were saved by people. Students will understand that humans were partially responsible for the extinction of takhi due to hunting, military activity and the introduction of livestock. Students will also understand that humans saved the takhi. Scientists and conservationists worked to breed and reintroduce takhi into the wild.

Activity 1: Journal Prompt – Draw and write about how people hurt and helped takhi. Include two examples of each.

Appendices

Appendix A: Delaware Prioritized Science Standards and Grade Level Expectations

Standard 6: Life Processes

Strand – Structure/Function Relationship
A: Plants and animals are similar to and different from each other in observable structures and behavior. These characteristics distinguish them from each other and from nonliving things.
Objectives:
Students will identify the differences between living and non-living things.
Students will compare and contrast the differences between domestic horses and the takhi.

Strand: Matter and Energy Transformation
A: Plants and animals are living things. All living things have basic needs for survival including air, water, food (nutrients), space, shelter, and light.
B: In addition to basic needs for survival, living things have needs specific to the organism such as temperature range and food requirements.

Objectives:
Students will identify what living things need to survive.
Students will identify what takhi, specifically, need to survive.

Strand: Life Processes and Technology Application
C. The ability of an organism to meet its needs for survival is dependent upon its environment. Manipulation of the environment can positively or negatively affect the well being of various organisms that live there.

Objective:
Students will know and identify what factors made the takhi become extinct in the wild.
Students will describe the takhi habitat on the reservation.
Students will understand cause and effect situations in regards to ecosystems.

Standard 7: Diversity and Continuity of Living Things

Strand – Diversity and Evolution
A: Students will recognize that there are many different kinds of plants and animals in the world. Students will recognize that some plants and animals are maintained in artificial environments to meet human wants and needs (i.e., scientific study, education, food).

Objective:
Students will understand that zoos and reservations are artificial environments.

Strand – Technology Applications
A: People use the variety of plants and animals found throughout the world for food, clothing, and shelter (e.g., silk for clothing, wood for building shelters).

Objective:
Students will understand that humans hunted the takhi for a certain purpose that led to their extinction.

Standard 8: Ecology

Strand - Interactions Within the Environment
A: An interconnectedness exists among the living and nonliving parts of an environment. This interconnectedness can be observed by the changes made by plants and animals in their environment.

Objectives:
Students will understand how weather and climate affect ecosystems and the survival of species, specifically the affect that climate and weather had on the takhi before, during and after reintroduction.

B: Plants and animals need enough space and resources to survive. Overcrowding leads to an increased need for resources.

Objective:
Students will be understand the requirements of the reservation and the habitat of the takhi that lead to their survival in the wild.

Strand – Energy Flow and Material Cycles in the Environment
A: All animals depend on plants. Some animals eat plants for food. Other animals eat animals that have eaten plants.

Objective:
Students will understand the relationship between the grass, cattle, livestock and the takhi.

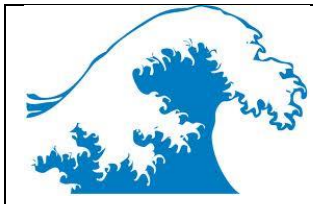
Strand – Human Impact
A: Many natural resources are limited. The amount available can be made to last longer by decreasing the use of some resources or by reusing or recycling certain materials.

Objective:
Students will understand that animals are a type of natural recourse that people need to respect and use appropriately.

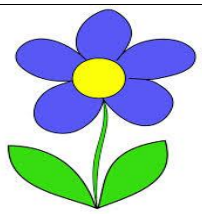
Appendix B: Student Activity Page- Living and Non-Living Sort

Directions: Cut and glue to sort the living and non-living things.

Living	Non-Living





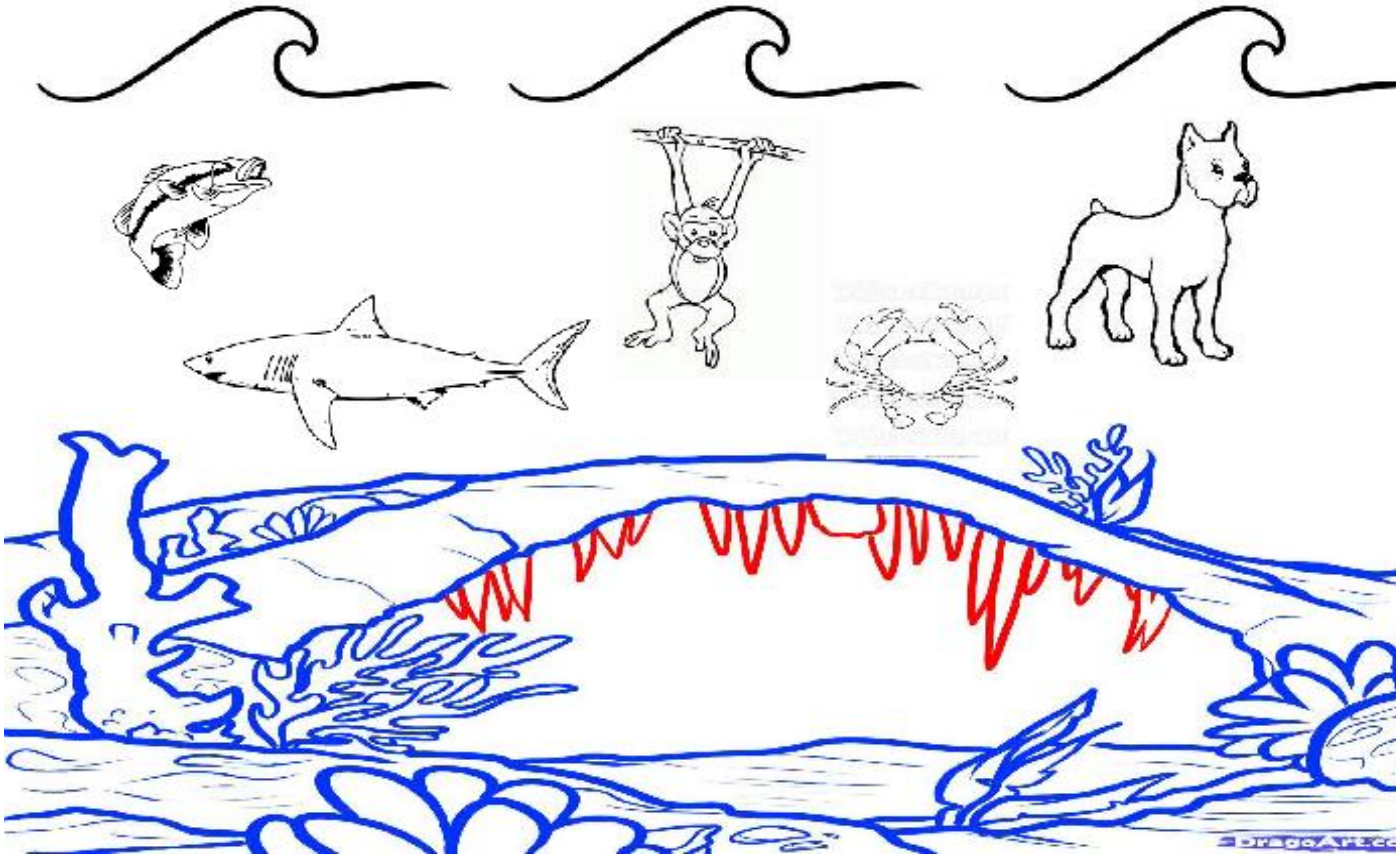





Appendix C: Student Activity Pages- Habitat Pages

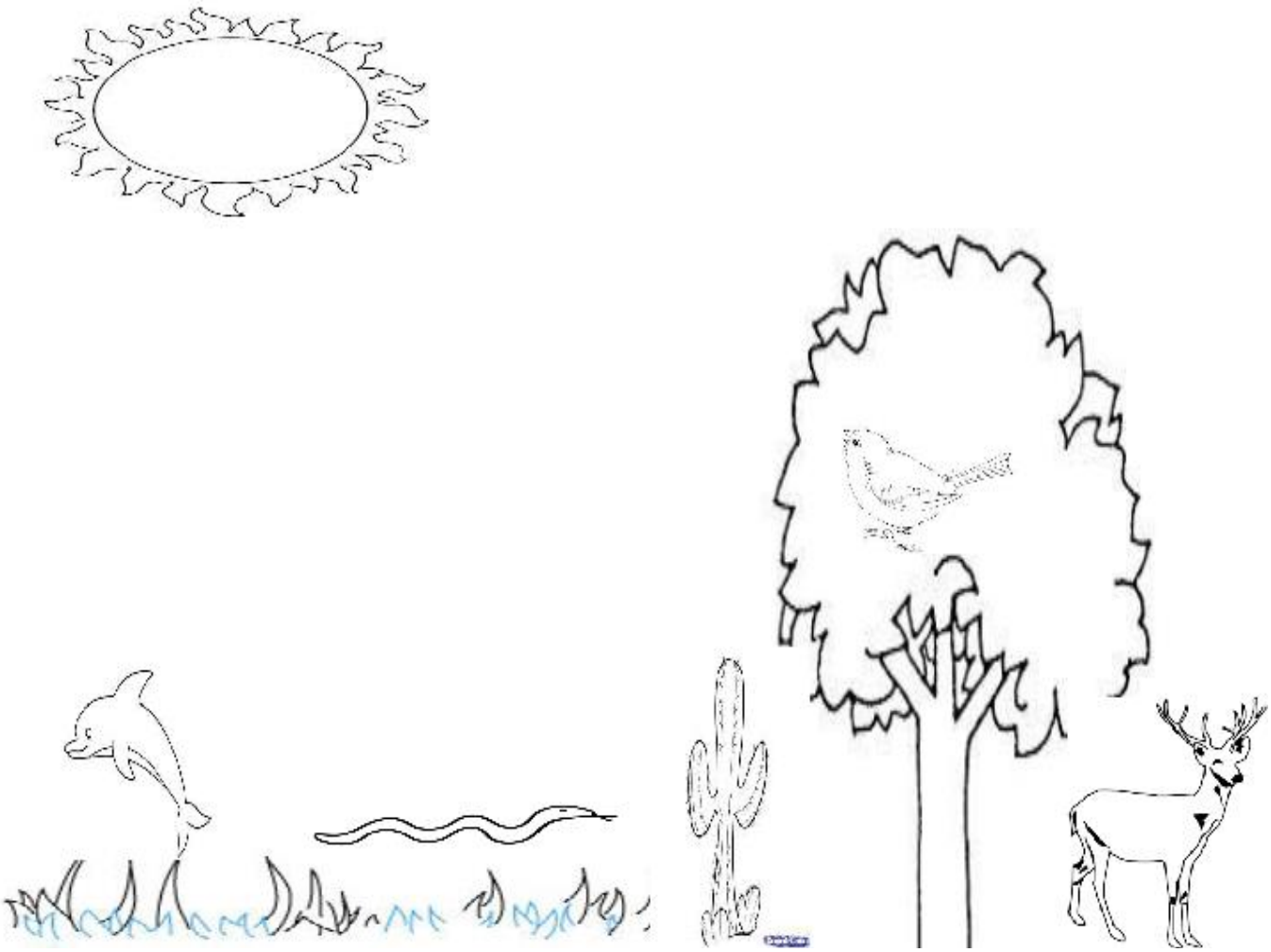
Cross out the things that don't belong in this habitat.
Color the living things yellow
Color the non-living things blue.

Ocean



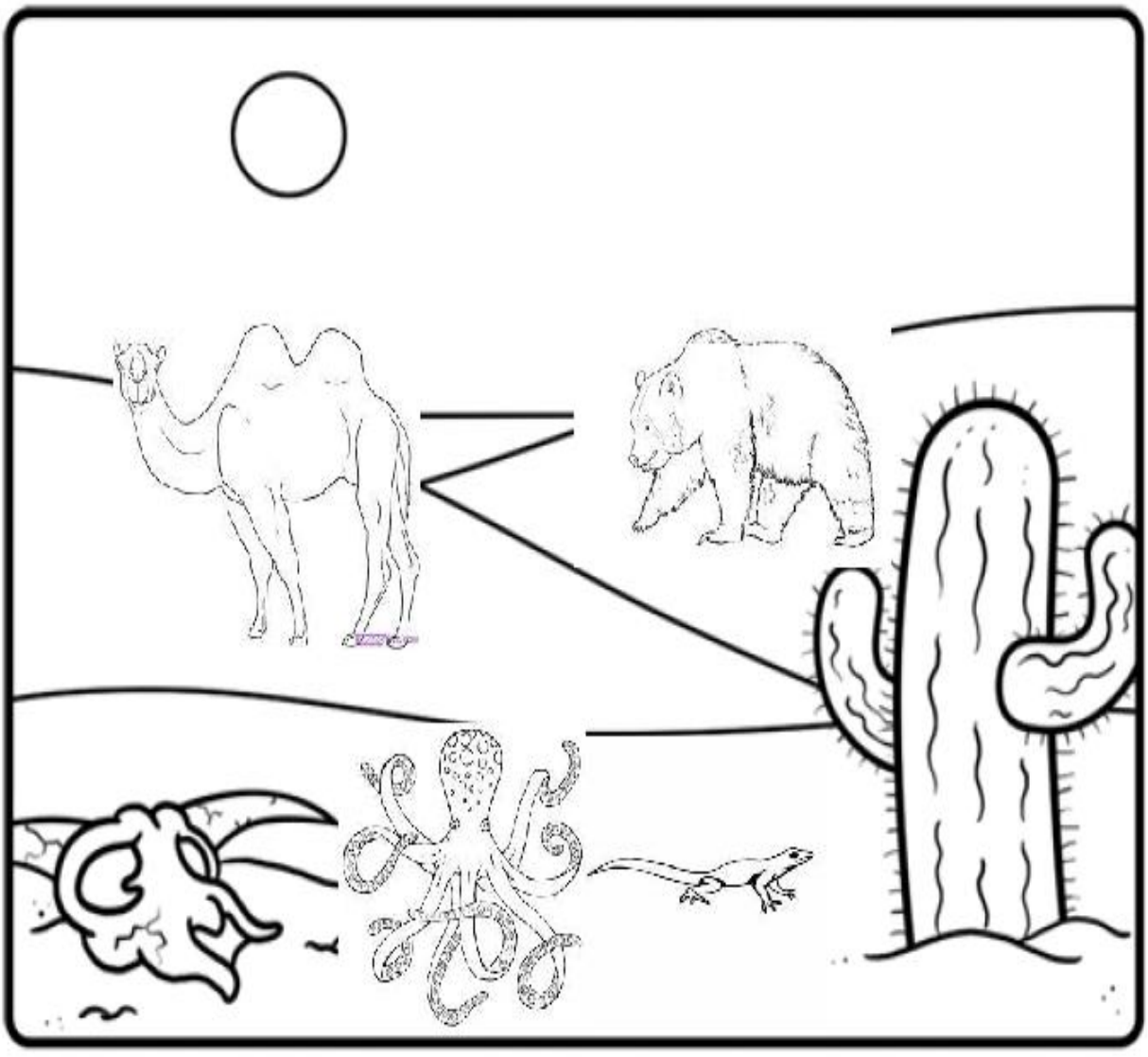
Cross out the things that don't belong in this habitat.
Color the living things yellow
Color the non-living things blue.

Forest



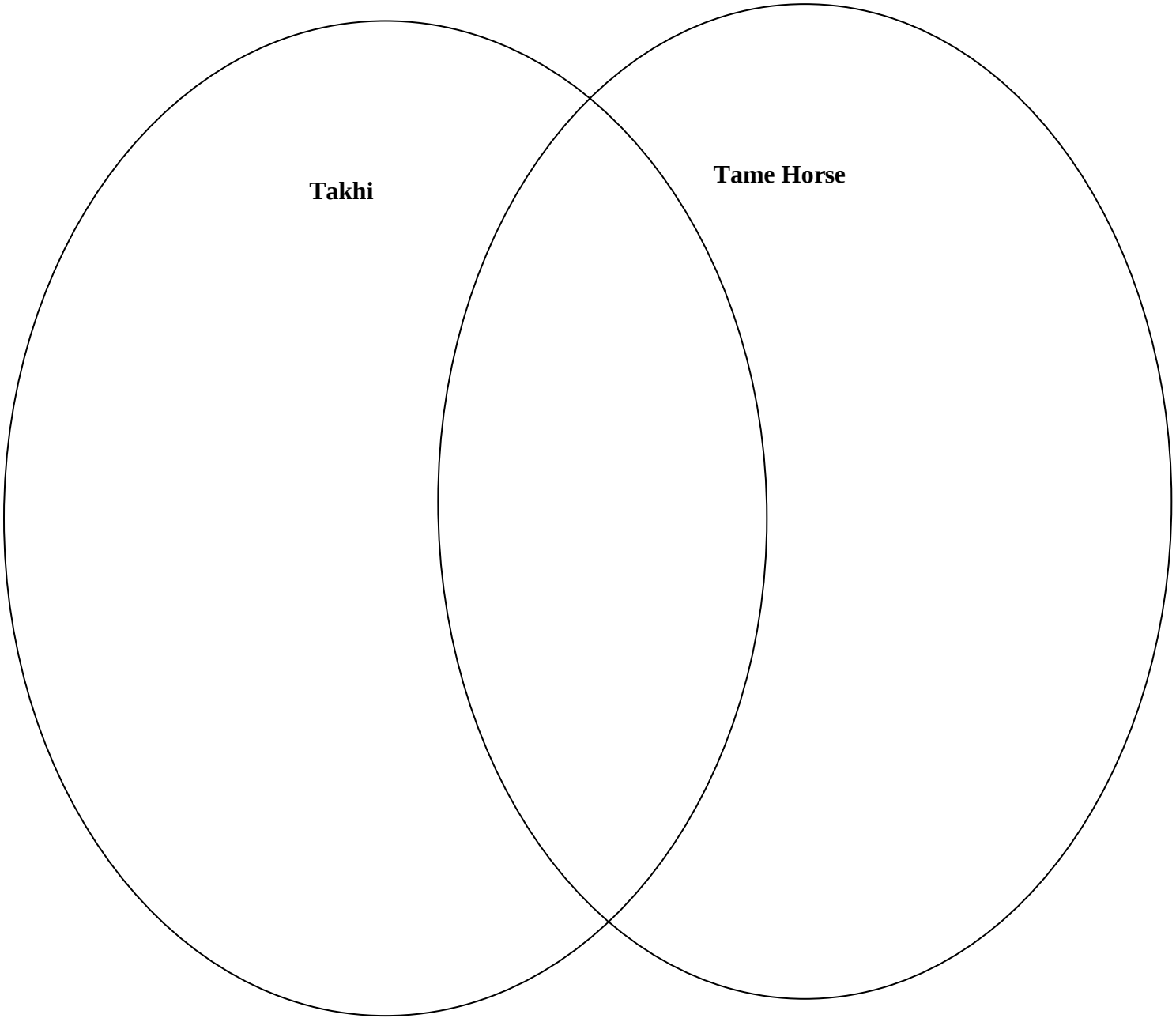
Cross out the things that don't belong in this habitat.
Color the living things yellow
Color the non-living things blue.

Desert



Appendix D: Venn Diagram

How are takhi and tame horses different?
How are takhi and tame horses the same?



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This is a first grade read aloud used in the Scott Foresman series to teach students how people can help animals.

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This newsletter gives updates on takhi in the wild.

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This video allows students to see takhi in their natural habitat.

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"Equus Ferus." (Asian Wild Horse, Mongolian Wild Horse, Przewalski's Horse). Accessed December 7, 2014. http://www.iucnredlist.org/details/41763/0.

This article gives information on Przewalski's Horse and it's habitat.

"Living and Non-Living - TeacherTube." TeacherTube. Accessed December 7, 2014. http://www.teachertube.com/video/living-and-non-living-176491.

This video teaches students the difference between living and non-living things.

Reid, Greg. *Deserts.* Philadelphia: Macmillan Library, 2003.

This is a non-fiction picture book that teaches students about desert habitats.

Reid, Greg. *Grasslands.* Philadelphia: Macmillan Library, 2003.

This is a non-fiction picture book that teaches young students about grasslands.

Reid, Greg. *Oceans*. Philadelphia: Macmillan Library, 2003.

This is a non-fiction picture book used to teach young students about the ocean habitat.

Reid, Greg. *Temperate Forests*. Philadelphia: Macmillan Library, 2003.

This is a non-fiction picture book used to teach young students about the forest habitat.

"Species List: Endangered, Vulnerable, and Threatened Animals." WorldWildlife.org. Accessed December 7, 2014. https://www.worldwildlife.org/species/directory?direction=desc&sort=extinction_status

This is a list of all current endangered species.

"Takhi Horses - National Wildlife Federation." Takhi Horses - National Wildlife Federation. Accessed December 7, 2014. http://www.nwf.org/Kids/Ranger Rick/Animals/Mammals/Takhi-Horses.aspx.

This article is written for children to learn about takhi. This is a good article to read aloud to students.

Walzer, Chris, Petra Kaczensky, Waltraut Zimmermann, and Christian Stauffer. "Przewalki's Horse Reintroduction to Mongolia: Status and Outlook." *World Association of Zoos and Aquariums*, January 1, 2012, 3-7.

This article provides background information on Przewalski's Horse.

Wright, Alexandra, and Marshall H. Peck. *Will We Miss Them?: Endangered Species*. Watertown, MA: Charlesbridge, 1992.

This is a non-fiction picture book used to give information to young readers about endangered species.

Notes

[1] "Endangered Animals saved from Extinction", *All About Wildlife,* May 16, 2011, http://www.allaboutwildlife .com.

[2] "Equus Ferus (Asian Wild Horse, Mongolian Wild Horse, Przewalksi's Horse), *The IUCN Red List of Threatened Species,* October 24, 2014, http://www.iucnredlist.org

[3] Chris Walzer, Petra Kaczensky, Waltraut Zimmerman, and Christian Stauffer, "Przewalski's Horse Reintroduction to Mongolia: Status and Outlook", *The Word Association of Zoos and Aquariums,* January 1, 2012

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KEY LEARNING, ENDURING UNDERSTANDING, ETC.

Students will learn the difference between living and non-living things. They will study endangered species, specifically an endangered Mongolian horse, the takhi. Students will explore the ways in which humans affect animals, especially endangered species.

ESSENTIAL QUESTION(S) for the UNIT

How have humans harmed and helped the takhi?

CONCEPT A	**CONCEPT B**	**CONCEPT C**
Organisms	Ecosystems and Habitats	Endangered Species/The Takhi
ESSENTIAL QUESTIONS A	**ESSENTIAL QUESTIONS B**	**ESSENTIAL QUESTIONS C**
What are the differences between living and non-living things? What are the characteristics of all living things? What do organisms require to survive?	How do plants and animals work together to survive? How do animals impact each other in their specific habitat?	How do humans negatively impact animals? How do humans help endangered species?
VOCABULARY A	**VOCABULARY A**	**VOCABULARY A**
Organism	Ecosystem Habitat	Endangered Species Extinct Steppe

ADDITIONAL INFORMATION/MATERIAL/TEXT/FILM/RESOURCES