

Brookfield Zoo Hoofed Animals Self-Guided Field Trip

*Multitouch Book
Teacher Guide*

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Introduction

The student multitouch book was created as a self-guided field trip resource for both teachers and students in the primary grades. While we hope teachers can bring their students to Brookfield Zoo, this can also be used as a virtual field trip. Next Generation Science Standards for kindergarten, first grade, and second grade connect to the content in the student book. Lessons and activities can be modified to meet the needs of students in intermediate grade levels. The book focuses on one area of Brookfield Zoo: the hoofed animal habitats. The student book is organized into three main chapters: Prezoo Activities (pre-field trip lessons and activities), Welcome to Brookfield Zoo (self-guided field trip activities), and Back in the Classroom (post-field trip lesson and activities).

NGSS Alignment

Kindergarten

K-LS1-1 FROM MOLECULES TO ORGANISMS: STRUCTURES AND PROCESSES

Students who demonstrate understanding can:

Use observations to describe patterns of what plants and animals (including humans) need to survive.

Crosscutting Concepts: Patterns
 Structure and Function

Science and Engineering Practices: Analyzing and Interpreting Data

Disciplinary Core Ideas: LS1.A Structure and Function

First Grade

1-LS1-1 FROM MOLECULES TO ORGANISMS: STRUCTURES AND PROCESSES

Students who demonstrate understanding can:

Use materials to design a solution to a human problem by mimicking how plants and/or animals use their external parts to help them survive, grow, and meet their needs.

Crosscutting Concepts: Patterns
 Structure and Function

Science and Engineering Practices: Constructing Explanations and Designing Solutions
 Obtaining, Evaluating, and Communicating Information

Disciplinary Core Ideas: LS1.A Structure and Function

Second Grade

K-2-ETS1-2 ENGINEERING DESIGN

Students who demonstrate understanding can:

Develop a simple sketch, drawing, or physical model to illustrate how the shape of an object helps it function as needed to solve a given problem.

Crosscutting Concepts: Structure and Function

Science and Engineering Practices: Answering Questions and Defining Problems
 Developing and Using Models
 Analyzing and Interpreting Data

Disciplinary Core Ideas: LS1.A Structure and Function

Using the Multitouch Book with Students

There are many ways the multitouch book can be used with students. Read the information below to determine the best way to utilize the multitouch book in the classroom. Modifications of the lessons and activities should be made to meet the needs of the class.

Teachers and students can view the multitouch book on a Mac or iOS device. Because it has multitouch features, it may work best on an iOS device. If viewing this book on a Mac, it requires OS X 10.9 or later. See Chapter 1 on “Using the Multitouch Book” for more information. Parts of the book require a Wi-Fi connection for use of the hyperlinks. Chapter 3, “Welcome to Brookfield Zoo,” does not require a Wi-Fi connection while using the book.

There are audio files on pages 21, 22, 23, and 56. Another option is to use the iPad accessibility features. To learn more about these options, please read the Apple Accessibility Features section on page eight of this teacher guide.

Options for Viewing the Multitouch Book

1:1 iPads or MacBooks	One teacher iPad or MacBook	Shared iPads or MacBooks
Each student could access his or her own book during the classroom activities and field trip. Contact your school district’s technology department to determine how to download the free book on each student device.	The teacher could download the free book on his or her device. Use an Apple TV to mirror the book to the projection screen for the whole class to read together.	Students could use the book in a small group setting. Contact your school district’s technology department to determine how to download the free book on each device.

Options for Using the Multitouch Book for a Field Trip

Virtual Field Trip	Field Trip Without Devices	Field Trip with Devices
<p>If classes are unable to visit Brookfield Zoo, use the book as a virtual field trip. Each chapter contains visuals for each of the six hoofed animals featured in the book.</p>	<p>Read Chapters 1, 2, and 3 as a class before coming on the field trip. There are activity pages that can be printed and brought to Brookfield Zoo to use during the field trip. Students or chaperones should have clipboards for a hard surface to write on.</p>	<p>If bringing devices on the field trip, be sure that the multitouch book is downloaded on each device <u>beforehand</u>. Downloading the book requires a Wi-Fi connection and may take a few minutes to download. Please have this prepared prior to arrival. Brookfield Zoo does not have public Wi-Fi access available.</p>

Features of the Multitouch Book

The multitouch book has many features and widgets that connect the reader to the material. See Chapter 1 of the student multitouch book to review how to use the features with students. Each time the book is opened in iBooks, it opens to the last page read. There is a table of contents within the student multitouch book to move between chapters.

Images and Videos

© 2017 Chicago Zoological Society. The Chicago Zoological Society is a private nonprofit organization that operates Brookfield Zoo on land owned by the Forest Preserves of Cook County.

Apple Accessibility Features

To have the multitouch book read aloud, turn on the Speak Screen accessibility feature. To turn on Speak Screen: go to Settings, Accessibility, and Speech, then slide Speak Screen to the “on” position. Another option is to use Speak Selection.

If using iPad apps to record data, dictation allows the students to talk where they could type. When Siri is enabled, a microphone will appear on the keyboard. Tap the keyboard microphone, wait for the tone, and speak. The microphone detects the speech and converts it into text.

For more information on assistive features for iOS, please check out Apple’s website at <http://www.apple.com/accessibility/ios/>.

Planning Your Trip

INFORMATION FOR TEACHERS TO KNOW ABOUT THE DAY OF THE VISIT

- Please follow the field trip reservation instructions found at CZS.org/FieldTrip.
- Enter Brookfield Zoo via the North Gate for a self-guided field trip. Buses must park in the North Lot.
- If the bus needs to leave Brookfield Zoo during the field trip, be sure the driver keeps his or her parking receipt to prevent having to repay upon re-entry.
- Classes will enter Brookfield Zoo through the walking tunnel joining the North Lot to the zoo.
- School groups with reservations must enter through the turnstile on the far right.
- Lunches: Students and adult chaperones are welcome to buy lunch at Brookfield Zoo or bring their lunches with them. There are no lockers for lunches or supplies. Students or adult chaperones are encouraged to carry their lunches; bus parking can be far away. Students are welcome to eat lunch at any of our picnic tables or on any of our lawns. In bad weather, students and adults may eat their lunches in any of our indoor seating areas.
- If classes have assigned chaperones, print off Chapter 2 activity pages (found in the Appendix of this teacher guide) to bring on the field trip.
- It is important that all chaperones have a schedule of the day's activities, have a map of the zoo (for locating restrooms, lunch areas, hoofed animals, etc.), and know the exact time and location for the class rendezvous. Chaperones must also know exactly what is expected of them and their students during the visit. This includes the behavior expectations of the children and the location and time scheduled for visiting the hoofed animals.

Chapter 1: Using the Multitouch Book

Chapter 1 is a brief introduction that explains how to use the multitouch features. This chapter is entirely in the student multitouch book. Pages 3 through 6 in the student book allow the students to open a hyperlink, play and pause an audio recording, swipe through a photo gallery, manipulate an interactive image, obtain the definition of a word, play a video, and draw on the interactive scratchpad. Students should learn to use the widgets in the book before moving forward to other chapters.

Chapter 2: Prezoo Activities

Chapter 2 of the multitouch book contains two classroom lessons that teach students skills they will use on the field trip. In the first lesson, students will learn what observations are and how to make observations, then practice making observations. The second lesson centers on using the map of Brookfield Zoo and identifying the hoofed animal species that are the field trip focus. The lessons, learning targets, and timeframes may be changed or adapted to meet the needs of the students.

Lesson 1: Making Observations Kindergarten, First Grade, and Second Grade

Learning Targets:

Students will define observations.

Students will learn to make and record observations.

Formative Assessment:

Observing student progress on collecting data is one way to formatively assess students during this lesson. See Chapter 4 in this teacher guide for more assessment ideas once the field trip has been completed.

Vocabulary:

observe/observation

magnifying glass

record data

senses

Materials:

- Chapter 2 of the multitouch book
- Chart paper (for the teacher)
- Markers (for the teacher)
- Pencils (for the students)
- Observation Activity Sheet (one per student, located in the Appendix of this teacher guide) or an iPad app that allows for voice recording if your students are not ready to write their observations
- Living or nonliving objects for the students to observe (one object per group)
 - Some examples include: plants, caterpillars, worms, fish, insects, fruit, candy, cookies

- Magnifying glasses (one per small group or one per student)
- Projector and projection screen

Lesson Part 1

Have the students open the multitouch book and turn to Chapter 2. Read the book together as you complete the pre-field trip activities for this chapter. What is an observation? (Ask the students for their ideas. Write these on a flip chart and underline key words.) Create a definition as a class using the key words from the flip chart. Write the definition on chart paper or a document projected on the screen.

Lesson Part 2

- How do you make observations? (Ask the students for their ideas and refer to the class definition.)
- Model how to make observations of a living or nonliving object.
 - “I am looking at this caterpillar and I see...I hear...” Other objects to use include but are not limited to the class pet, a pineapple, a plant, a stuffed animal, and a patterned piece of material. Be creative!
 - If a BrainPOP Jr. subscription is available, there are videos called “Senses” and “Making Observations” to show before modeling.
 - If the students have not used magnifying glasses before, explain how to appropriately use them.
 - Write down teacher observations on chart paper, a document, or an iPad app projected on a screen. Or write on the same sample page that the students will use (Appendix in this teacher guide, page 33). If the students are not ready to write or type observations, choose an app with a voice-recording feature. Some apps that would work for this include but are not limited to Explain Everything, Quick Voice, Educreations, Showbie, Seesaw, and Book Creator. Please note that some of these apps may not work without a Wi-Fi connection, so keep that in mind if using the same app to record data while at Brookfield Zoo. If necessary, just have the students draw their observations.

Lesson Part 3

- How do we keep track of our observations?
- Show the students one more object. This time, choose a few student volunteers to help demonstrate how to make observations. For the object, student volunteers should explain what they see, feel, smell, and hear.
- Next, put the students into small groups. Give each small group a physical object. Each group may have the same object, or you may choose to give different objects. Once the students have made observations and recorded them, bring the class back together for students to share their data.

See the Appendix in this teacher guide for a sample student observation data collection page (page 33).

Lesson Part 4

- If the students viewed the BrainPOP Jr. video, use the multiple-choice quiz as formative assessment. Label the corners of the classroom A, B, C, and D. As questions are asked, the students should “vote with their feet” and move to specific corners of the room based on their answer. This is a great way to review the information learned in the lesson.
- If the students did not view BrainPOP Jr., create review questions based on the lesson. This can be done in a presentation slideshow or a tool such as Kahoot or Quizizz.

Lesson Part 5

Optional Lesson Closure: Taking Photographs with the iPad

- If the students are bringing devices on the field trip, practice taking photographs as a closure to the observation lesson. Pages 14 and 15 in the multitouch book give helpful tips for taking photographs with the iPad.
- After the students take photographs, assign partners. Partner A will show his or her three photographs to partner B. Have the partners determine which is the highest-quality picture out of the three and explain their reasons for choosing that photo. Then have Partner B share with Partner A.
- Have two student volunteers share their highest-quality photo with the class. Review and discuss how the student volunteers were able to take high-

quality photos. If possible, use the projector to show these photos to the whole class.

- Teach the students how to crop around the object in one of their photos.

Lesson 2A: Identifying Hoofed Animal Species Kindergarten, First Grade, and Second Grade

Learning Target:

The students will identify hoofed animal species at Brookfield Zoo.

Formative Assessment:

Use this lesson to formatively assess whether the students are familiar with the hoofed animals they will see at Brookfield Zoo.

Vocabulary:

hoof

species

Bactrian camel bak-trē-ən ka-məl

Grevy's zebra grā-'vēz zē-brə

okapi ō-'kā-pē

reticulated giraffe ri-'ti-kyə-lət-ed jə-'raf

Przewalski's horse pshə-'väl-skēz hōrs

addax a-ˌdaks

Materials:

- Chapter 2 of the multitouch book

Lesson:

- Have the students turn to page 16 in the multitouch book. Read page 16 together. Review the animal names as the students use the interactive widget on page 17. Explain that these are the animals they will observe during the field trip.
- After exploring the animals as a class, move on to lesson 2B on pages 18 and 19 of the student multitouch book (using the map of Brookfield Zoo). Or complete lesson 2B the day before the field trip.

Lesson 2B: Using the Map of Brookfield Zoo Kindergarten, First Grade, and Second Grade

Learning target:

The students will find specific objects on a map.

Formative Assessment:

Use this lesson to formatively assess whether the students are able to identify specific features on a map, including animals, colors, directions, and locations.

Vocabulary:

map

directions

key

path

entrance

compass rose

Bactrian camel bak-trē-ən ka-məl

Grevy's zebra grā-'vēz zē-brə

okapi ō-'kā-pē

reticulated giraffe ri-'ti-kyə-lət-ed jə-'raf

Przewalski's horse pshə-'vāl-skēz hōrs

addax a-,daks

Materials:

- Chapter 2 of the multitouch book

Lesson:

- Have the students turn to page 18 in the multitouch book. Read page 18 together. As a class, look at the map of Brookfield Zoo in the multitouch book on page 19. A blue hyperlink at the bottom of page 19 allows the students to open the PDF in Safari and then “Open in” an app that allows for drawing on the map.
- Have the students zoom in on the map and use a pen tool to circle specific areas of the map. Apps that allow for this include but are not limited to Explain Everything, Paperport Notes, and PDF Highlighter.

- Discuss the different colors, geometric shapes, landscape, and architecture on the map. Guided questions for this discussion include but are not limited to:
 - What animals do you see on the map?
 - What do the following colors represent?
 - Dark green
 - Light green
 - Blue
 - White
 - Gray
 - Locate the compass. What is it used for?
 - Locate the red dotted line. What is it used for?
 - Locate the key. What are some of the places included in the key?
 - Locate the North Gate. Circle the North Gate.
 - Explain to the students that this is the entrance where the class will arrive for the field trip. Talk about the directions from the North Gate to the first habitat of the Bactrian camels. The students may open a PDF of the map into an app on the iPad that allows for PDF markup.
 - Circle the following animal habitats on the map:
 - Bactrian camel bak-trē-ən ka-məl
 - Grevy's zebra grā-'vēz zē-brə
 - okapi ō-'kā-pē
 - reticulated giraffe ri-'ti-kyə-lət-ed jə-'raf
 - Przewalski's horse pshə-'vāl-skēz hōrs
 - addax a-ˌdaks

- Chapter 3 of the student multitouch book (Welcome to Brookfield Zoo) can be read together as a class before the field trip. Another option is to have the students follow along as the teacher or chaperone reads each section during the field trip. For example, as the group gets to the Bactrian camel habitat, have the students turn to page 24 of the multitouch book and read the section together.

- Review what items students will bring on the field trip and answer any questions they have. Here are some things to consider reviewing with students before arriving at Brookfield Zoo:
 - How the students will use the multitouch book while at Brookfield Zoo.
 - Appropriate times to use the device during the field trip.
 - Proper care and handling of the devices.

- How many devices will the class bring on the field trip? Will each student have their own or will there be one device per group?
- Storage of iPads when the students are not using them.
- Will each chaperone have a bag to hold their group's iPads or will each student be responsible for his or her own?
- Remind the students and chaperones to make sure everyone has their device before moving on to the next habitat.
 - The students could have a buddy within each group to help each other be responsible with devices.
 - Have the students hold up their iPad so the teacher or chaperone can see that each child has his or her device throughout the trip. *The Chicago Zoological Society is not responsible for lost, stolen, or damaged items.*
- Review expectations for taking pictures during the field trip.
 - If there is one iPad per group, will the students take turns with the iPad at the habitats? Will the chaperone be taking the photos?
 - Will the students be taking pictures only of the animals?
 - Will they be taking pictures of their group members?
 - Remind the students about being good digital citizens while using the camera feature on the iPads.
 - Remind the students that they should not stand on objects while taking photographs. Teachers and chaperones should help guide the students with taking good photographs while on the field trip. Students may need to back up to be able to take a photograph of an animal in its habitat.
 - Remind students to hold the iPad with both hands and to stand still while taking the photographs.

Chapter 3: Welcome to Brookfield Zoo

Chapter 3, Welcome to Brookfield Zoo, contains activities to be completed during the field trip. If the students bring devices on the field trip, be sure to have the multitouch book downloaded on all devices before arriving. If you are visiting without devices, read through Chapter 3 with your class before coming to Brookfield Zoo. A printable PDF activity page (in the Appendix, pages 35 to 43) accompanies Chapter 3 and can be used in place of iPads.

Chapter 3 does not require a Wi-Fi connection to view or complete the activities. The book focuses on six hoofed animals. Depending on the number of chaperones and students, classes can visit each animal and make observations as one big group. Another option is to split the class into smaller groups and have chaperones take groups to all of the habitats or to a specific number of habitats. Determine a time to meet back together as one group and choose a meeting space. (See pages 20 and 21 in this teacher guide for sample group rotation schedules.)

Before heading to the hoofed animal habitats, encourage the students to open their multitouch book to page 19 to view the map. Have the students lock the orientation of the iPad screen so it doesn't constantly switch from portrait to landscape view. For more information on how to lock the orientation, please visit <https://support.apple.com/en-us/HT204171>.

As classes walk into Brookfield Zoo from the North Gate, notice the restrooms on the left beside the gift shop. The hoofed animal habitats are to the right. Turn to the right and then walk straight to see the Bactrian camels, Przewalski's horses, Grevy's zebras, addax, and okapi. (This order may vary based on the season). Once at the end of the sidewalk, turn around and retrace your steps to view the giraffes in Habitat Africa! The Savannah, which will be on the right side.

Chapter 3 in the student multitouch book features each of the hoofed animals and follows a pattern of three activities: observe, take photographs, wonder.

- **Observe (six minutes)**
 - Assign each small group a specific observation focus before the field trip. For example, one group is the “ear expert” group. Explain to the students that the “ear experts” will observe the ears for the shape, size, and movement. See below for additional targeted observations based on the post-field trip lessons.
 - Kindergarten: how body parts help with survival

- First grade: how body parts help avoid insects
 - Second grade: how the shape of body parts helps with survival
- The students should arrive at the first habitat and observe the animal for their expert focus for three minutes, then make general observations for three minutes. The time may vary depending on student abilities. (See page 20 in this teacher’s guide for a sample timetable).
- The chaperone or students can take turns setting a timer for the observations.
- The students or the chaperone can write, draw, or record observations in an app or on the printable observation page found in the Appendix (pages 35 to 40) in this teacher guide.
- Each “expert group” should report their data to the class upon returning to the classroom. See Chapter 4 in this teacher guide for post-field trip lessons.

Ideas for “expert observation groups”:

- Ear experts
- Tail experts
- Eye experts
- Nose experts
- Unique characteristics experts
- **Take Photographs (three minutes)**
 - Before the students take photographs at the first habitat, you may want to review your rules and expectations for taking photographs with the group. See pages 16 and 17 in this teacher guide.
 - After the students observe, have them take three good photographs of the whole animal. The students can crop the photographs for their specific expert focus upon returning to the classroom.
- **Wonder (three minutes)**
 - Have the students share one thing they wonder about the animal. The teacher or group chaperone can write these down, or the students can record their voice in another iPad app such as Quick Voice or Explain Everything.
 - See the Appendix of this teacher guide (pages 41 to 43) for the teacher and chaperone wonder document.

Approximate time frame for each hoofed animal habitat:

- Expert observations 3 minutes
- General observations 3 minutes
- Take photographs 3 minutes
- One wonder 3 minutes

12 to 15 minutes

Sample schedule rotation if expert groups go to all habitats:

	Starting habitat					Ending habitat	Meet at the exit to the Habitat Africa! The Savannah habitat at: <hr/> am pm
Ear Expert Group 1	Bactrian camel 12 to 15 minutes	Przewalski's horse 12 to 15 minutes	Grevy's zebra 12 to 15 minutes	Addax 12 to 15 minutes	Okapi 12 to 15 minutes	Giraffe 12 to 15 minutes	
Tail Expert Group 2	Przewalski's horse 12 to 15 minutes	Grevy's zebra 12 to 15 minutes	Addax 12 to 15 minutes	Okapi 12 to 15 minutes	Giraffe 12 to 15 minutes	Bactrian camel 12 to 15 minutes	
Eye Expert Group 3	Grevy's zebra 12 to 15 minutes	Addax 12 to 15 minutes	Okapi 12 to 15 minutes	Giraffe 12 to 15 minutes	Bactrian camel 12 to 15 minutes	Przewalski's horse 12 to 15 minutes	
Nose Expert Group 4	Addax 12 to 15 minutes	Okapi 12 to 15 minutes	Giraffe 12 to 15 minutes	Bactrian camel 12 to 15 minutes	Przewalski's horse 12 to 15 minutes	Grevy's zebra 12 to 15 minutes	
Unique Characteristics Group 5	Okapi 12 to 15 minutes	Giraffe 12 to 15 minutes	Bactrian camel 12 to 15 minutes	Przewalski's horse 12 to 15 minutes	Grevy's zebra 12 to 15 minutes	Addax 12 to 15 minutes	

If the students visit all of the hoofed animal habitats to observe, take photographs, and wonder, the time frame would be approximately one hour and thirty minutes. Please adjust your schedule to meet the needs of your class.

Depending on the time frame and number of students, there can be multiple expert groups per topic. Another option would be to visit only three of the hoofed animal habitats per group.

Sample schedule rotation if expert groups make observations of three habitats:

	Starting habitat		Ending habitat	Meet at the exit to the Habitat Africa! The Savannah habitat at _____ am pm
Ear Expert Group 1	Bactrian camel 12 to 15 minutes	Przewalski's horse 12 to 15 minutes	Grevy's zebra 12 to 15 minutes	
Ear Expert Group 2	Addax 12 to 15 minutes	Okapi 12 to 15 minutes	Giraffe 12 to 15 minutes	
Tail Expert Group 1	Grevy's zebra 12 to 15 minutes	Addax 12 to 15 minutes	Okapi 12 to 15 minutes	
Tail Expert Group 2	Giraffe 12 to 15 minutes	Bactrian camel 12 to 15 minutes	Przewalski's horse 12 to 15 minutes	
Eye Expert Group 1	Okapi 12 to 15 minutes	Giraffe 12 to 15 minutes	Bactrian camel 12 to 15 minutes	
Eye Expert Group 2	Przewalski's horse 12 to 15 minutes	Grevy's zebra 12 to 15 minutes	Addax 12 to 15 minutes	

Please note that the location of animals may change. If an animal is not there, feel free to move on to the next habitat. Habitat Africa! The Savannah has a wonderful meeting area where classes can debrief after the students make observations of the hoofed animals. This is located outside of the exit to the building.



Chapter 4: Back in the Classroom

Chapter 4 in the student multitouch book contains a post-field trip lesson, an assessment idea, and activities for each primary grade level. The chapter is split into different sections for each grade level lesson.

Kindergarten Post-Field Trip Lesson

K-LS1-1 FROM MOLECULES TO ORGANISMS: STRUCTURES AND PROCESSES

Students who demonstrate understanding can:

Use observations to describe patterns of what plants and animals (including humans) need to survive.

Learning Target:

The students will use their animal observations to describe patterns of what animals need to survive.

Formative Assessment:

- Listen to student discussions and the vocabulary they use while meeting with their expert groups.
- Listen to students communicating their data during small and whole group discussion.
- Revisit the Wonder questions from Brookfield Zoo. Are the students able to answer the Wonder questions from the field trip? Have the students work with each other or with older buddy students to help research their questions.

Vocabulary:

survival

need

pattern

compare

Materials:

- Blank Venn diagrams for each expert group (chart paper, digital, or paper)
- Blank Venn diagram for teacher model example (chart paper, digital, or paper)
- Markers
- Student observation notes and photos from field trip

- Image of reticulated giraffe (for teacher example)
 - <https://www.czs.org/Brookfield-ZOO/Zoo-Animals/Habitat-Africa!-The-Savannah/Reticulated-Giraffe.aspx>
- Image of Przewalski’s horse (for teacher example)
 - <https://www.czs.org/Brookfield-ZOO/Zoo-Animals/Hoofed-Animals/Przewalski-s-Horse>

Lesson Part 1:

Upon returning from the field trip, read Chapter 4, Section 1, of the multitouch book as you move through this lesson with the students. Reinforce the vocabulary words “survival” and “pattern” using student-provided examples. Ask the students to share examples of what both animals and humans need to survive. Ensure that the students understand “survival” and “pattern” and are able to connect the two concepts. Use a flip chart to write down student ideas.

Lesson Part 2:

Comparing Our Observations

- Before the lesson, prep a blank Venn diagram for each expert group. If a document camera is not available, use chart paper so the students can see the comparison.
- Share an example from the hoofed animal habitats that demonstrates an observed survival pattern. This example can be found on page 52 of the student multitouch book. For this teacher example, we will focus on the neck. The neck is not one of the expert groups, but we will use it as an example so not to repeat information that the students have. Compare and contrast the different necks of two animals. Be sure to use the vocabulary words “survival” and “pattern” to explain your thinking.

Example for the Venn Diagram:

Giraffe	Both	Przewalski’s horse
<ul style="list-style-type: none"> • Neck is long and lean • Can be up to 8 feet to eat leaves in the tall trees 	<ul style="list-style-type: none"> • Length of neck helps to obtain food source 	<ul style="list-style-type: none"> • Neck is much shorter than the giraffe to reach grass

- The goal is for the class to identify survival patterns they notice for their expert area for two animals. Have each expert group sit together to determine what survival patterns they will share with the class for two of the animals. Encourage the groups to look through their data by looking at any observations first and then pictures of the animals.
- Call on each expert group to share what it noticed for two of its animals. Use a separate Venn diagram for each group and write in the similarities and differences as the students share.

Possible questions to ask the students:

- How are the eyes (ears, tail, etc.) alike and different between the two animals?
- How do the eyes (ears, tail, etc.) help the two animals to survive?

Closing:

After each of the expert groups share their ideas, write a sentence or two as a class that describes how the particular expert trait of the hoofed animals helps with survival.

Common Core State Standards Connections:

ELA/Literacy-

W.K.7 Participate in shared research and writing projects (e.g., explore a number of books by a favorite author and express opinions about them). (K-LS1-1)

Mathematics

K.MD.A.2 Directly compare two objects with a measureable attribute in common, to see which object has “more of”/”less of” the attribute, and describe the difference. (K-LS1-1)

First Grade Post-Field Trip Lesson

1-LS1-1 FROM MOLECULES TO ORGANISMS: STRUCTURES AND PROCESSES

Students who demonstrate understanding can:

Use materials to design a solution to a human problem by mimicking how plants and/or animals use their external parts to help them survive, grow, and meet their needs.

Learning Target:

The students will create a solution to a human problem that mimics how animals use their external body parts.

Formative Assessment:

- As the students create their solution with their partners, listen to student discussions and the vocabulary they are using as they communicate.
- Listen to the students communicating their data to each other through partner discussion and whole group presentations.
- Questions to ask the students as they are designing a solution:
 - What animal part/behavior does your solution mimic?
 - How does this help humans fight off their insect problem?

If creating a rubric for the solution design, here are categories that could be included:

- Animal inspiration
- How does this design help humans solve their insect problem?
- How does the solution work?
- Eye contact
- Voice volume
- Teamwork, etc.

Vocabulary:

mimic
external
design
problem
solution

Materials (may include but are not limited to):

- Large drawing paper (if the students are drawing their solution instead of building with materials)
- Cardstock, construction paper, or newspaper
- Popsicle sticks
- Pipe cleaners
- Index cards
- Sticks
- Cotton balls or swabs
- Clear or masking tape
- Egg cartons
- Yarn or string
- Netting
- Pantyhose
- Paper or binder clips
- Glue
- Rubber bands

Lesson Part 1:

After the field trip, read through Chapter 4, Section 2, of the student multitouch book as a class. Have a discussion about how all organisms have external body parts. (Connection to LS1.A and LS1.D) The external parts help the organisms to survive, grow, and meet their needs. Talk about animal observations that were made during the field trip that relate to external body parts.

Present the problem below to the students.

Scenario/Problem:

You are trying to enjoy a beautiful picnic lunch outside with your friends. Flies that are trying to get to your food are bothering you. Use what you observed on the field trip with your partner to solve the problem of insects bothering you. Think about the animals we saw and how they used their external body parts. Your solution should mimic the animal's ability to fight off insects.

- The students will work with a partner to create a solution to the problem. Each pair will have materials to help come up with the solution. The students may choose to draw their solution or select materials from the list above to build their model.

Teacher notes:

Here are *some* examples of animal solutions to the posed problem:

- Tail movement
- Ears twitching
- Eyes blinking
- Rolling in dirt
- Stomping
- Hooves scratching

Closing:

- Each student pair will share their solution to the class problem.

Common Core State Standards Connections:

ELA/Literacy-

W.1.7 Participate in shared research and writing projects (e.g., explore a number of “how-to” books on a given topic and use them to write a sequence of instructions).
(1-LS1-1)

Second Grade Post-Field Trip Lesson

K-2-ETS1-2 ENGINEERING DESIGN

Students who demonstrate understanding can:

Develop a simple sketch, drawing, or physical model to illustrate how the shape of an object helps it function as needed to solve a given problem.

Learning Target:

The students will design an animal that can survive in a certain habitat.

Formative Assessment:

As the students present their new animals to the class, here are possible questions to ask:

- Describe your animal’s habitat.
- Describe the body parts you used to create your animal.
- How does the shape of the body parts help the animal survive in this habitat?

Vocabulary:

habitat

survival

Materials:

- Large drawing paper for each small group
- Pencils
- Markers or colored pencils
- Collected student photographs from the field trip for students to access (either digitally or printed for each group)

Lesson Part 1:

- Upon returning from the field trip, have the expert groups look through their photos and submit their best photo from each hoofed animal habitat to the teacher. The students will be using each others' photos to design or create an animal for a specific habitat. There are many ways to collect photographs. Apps or tools that allow for photo upload and or collection include but are not limited to:
 - Email (students email photos to the teacher)
 - Showbie (students upload into an assignment, teacher saves them and puts them into a shared folder assignment)
 - Seesaw (students upload an image to the class feed)
 - Drive (students upload into a shared folder)

Another option is to print the photos once collected.

- Once photos are collected, discuss the hoofed animals that the students observed while on the field trip. Have each of the expert groups share some of their data and photographs with the class. Discuss the different external parts that the students observed.

Possible questions to ask the expert groups as they share photographs:

- How does the tail (ears, eyes, etc.) help the animal to survive?
- What movement did you observe?

Lesson Part 2:

- Explain to the students that they will be creating an animal based on what they observed and learned about the different body parts. This animal should be designed to survive in a certain habitat. The students may design a simple sketch, drawing, or model of the animal. The students will need access to photos collected on the field trip to help them design their animal.
- Based on your students' background knowledge, you may need to teach the students about different habitats before they design the animals. If the students have not learned about different habitats, this lesson could be extended and broken up into additional days. Another option is to incorporate learning about habitats into guided reading instruction by using informational text in small groups.
- The BrainPOP Jr. "Habitats" video is a possible resource that can build background knowledge before the students design their animals. Before showing any videos to your students, please be sure to preview the videos to be sure they fit in with the needs of your students.
- Consider using picture books as another resource for additional habitat lessons. When looking for different read-alouds or books to support habitats, a great resource is your school librarian, media specialist, or instructional coach.
- Jigsaw the expert groups to create new design groups. The students will then plan and create their new animal for their assigned habitat.

Here is a list of possible habitats to assign to the groups:

- Jungle
- Desert
- Arctic
- Grassland
- Forest

Closing:

After the students have designed their animals, have each group present their ideas to the class.

Common Core State Standards Connections:

ELA/Literacy-

SL.2.5 Create audio recordings of stories or poems; add drawings or other visual displays to stories or recounts of experiences when appropriate to clarify ideas, thoughts, and feelings. (K-2 ETS1-2)

Have the students write a story or poem that connects to the animal they created. They could use any of the following apps to add images, text, and record their voice: ChatterPix, Explain Everything, or Educreations.

Additional Brookfield Zoo Resources

Connections Classes and Zoo Talks for School Groups

Connections classes are opportunities for PreK-12 students to enhance their knowledge base while visiting Brookfield Zoo. Classes are available Monday through Friday year-round. Please see the Connections Catalog for more details. CZS.org/ClassConnect

Teacher Continuing Education and Graduate Classes

Looking to learn more about Brookfield Zoo to help support student learning in the classroom? Teacher classes are offered throughout the year on a wide range of topics. The classes offer PDCHs. Many classes provide optional graduate credit for an additional fee. For more information about our teacher classes, please visit CZS.org/Teacher-Classes.

Master's Degree Program

The Chicago Zoological Society and Project *Dragonfly* at Miami University in Ohio partner to bring an exciting master's degree program to Chicagoland. The **Advanced Inquiry Program (AIP)** is a conservation-focused, inquiry-driven learning experience. It combines web-based graduate courses through Miami University with face-to-face learning and field study at Brookfield Zoo. Enrollment is open to applicants with a bachelor's degree regardless of academic major or profession. The AIP can be completed part-time while working and is designed for anyone interested in contributing to social and ecological change in their community. For more information, please visit CZS.org/AIP.

Appendix

Making Observations Activity, Student Page (pages 33 to 34)

- This page coincides with Chapter 2 (Pre-Zoo Activities) of the student multitouch book.

Field Trip Expert Group Observation Activity, Student Page (pages 35 to 40)

- This page coincides with Chapter 3 (Welcome to Brookfield Zoo) of the student multitouch book.

Field Trip Wonder Activity, Teacher or Chaperone Page (pages 41 to 43)

- This page coincides with Chapter 3 (Welcome to Brookfield Zoo) of the student multitouch book.

Name _____

Making Observations
Pre-Field Trip Activity

What object are you observing? _____

See	Touch
Draw an image as a class to represent sight:	Draw an image as a class to represent touch:
My observations: _____ _____ _____ _____ _____ _____ _____ _____	My observations: _____ _____ _____ _____ _____ _____ _____ _____

What object are you observing? _____

Smell	Hear
Draw an image as a class to represent smell:	Draw an image as a class to represent hearing:
My observations: _____ _____ _____ _____ _____ _____ _____	My observations: _____ _____ _____ _____ _____ _____ _____

Name _____

Field Trip Expert Group Observations

What is my expert group focusing on? Circle your focus below:

ear tail eye nose unique characteristics other: _____

Bactrian camel	
My expert focus observations:	<hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/>
General observations:	<hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/>

What is my expert group focusing on? Circle your focus below:

ear tail eye nose unique characteristics other: _____

Przewalski's horse

My expert focus observations:

General observations:

What is my expert group focusing on? Circle your focus below:

ear tail eye nose unique characteristics other: _____

Grevy's zebra

My expert focus observations:

General observations:

What is my expert group focusing on? Circle your focus below:

ear tail eye nose unique characteristics other: _____

Addax

My expert focus observations:

General observations:

What is my expert group focusing on? Circle your focus below:

ear tail eye nose unique characteristics other: _____

Okapi

My expert focus observations:

General observations:

What is my expert group focusing on? Circle your focus below:

ear tail eye nose unique characteristics other: _____

Reticulated giraffe

My expert focus observations:

General observations:

What Do We Wonder?

Below is a space to jot down questions your group may have about each of the hoofed animals during the field trip.

Bactrian camel

Przewalski's horse

Grevy's zebra

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Addax

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Okapi

Reticulated giraffe

About the Authors

This was created as an extension of the Apple Distinguished Educators Community Engagement project in order to enhance the self-guided field trip experience for teachers and their students while at Brookfield Zoo.

Megan Ryder: Educator. Mrs. Ryder started her educational career on figure skates, teaching basic skills to skaters of all ages while working on her Bachelor's of Science degree at Western Michigan University. She completed her Master's in Curriculum and Instruction, Instructional Technology from Lewis University in 2012. After teaching 5th grade for seven years, she became an instructional coach for two elementary schools and one middle school. She is also an Apple Distinguished Educator, Class of 2015.

Agnes Kovacs: School, Groups, and Teacher Program Manager, Chicago Zoological Society. Agnes Kovacs has been the director of for-profit and not-for-profit child care centers, including corporate-owned and the State of Iowa's model day care. She has worked as the Executive Director of the Elgin Area Childcare Initiative, Administrator of Home Based Care Corporation, and a day care home DCFS licensing representative. She has been adjunct faculty at several colleges and universities. Agnes gives numerous workshops and trainings in the greater Chicago area. She has served as a member of the National Association for the Education of Young Children's center accreditation validation team and as a lead literacy coach for the Chicago Public School System. Her Master's in Elementary Education is from the University of Iowa. She currently works as the Senior Manager of the School, Groups, and Teacher Programs at the Chicago Zoological Society/Brookfield Zoo, managing five educational programs for the Zoo.

Marjorie Baker: School Programs Coordinator, Chicago Zoological Society. Ms. Baker manages the *Institute of Science Teaching Excellence*, develops and teaches classes focusing on NGSS, provides in-classroom coaching, and collaborates with school and community partners, as well as supervises instructors for school classes at Brookfield Zoo. A former science teacher in the Baltimore (MD) County Public Schools and Chicago Public Schools, Ms. Baker also served as Outreach Specialist at the National Aquarium. She holds a Master's in Secondary Science Education and a Bachelor's of Science in Marine Biology from the University of Maryland and is a certified public school teacher in both Maryland and Illinois.

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