



Collaborative Inquiry Project

TEACHER & CHAPERONE GUIDE
GRADES 7-8



3900 Wildlife Way, Cleveland, Ohio 44109 • (216) 661-6500

Getting Started

- Use the tools inside this kit to explore and navigate through the Zoo and experience the *Collaborative Inquiry Project*.
- Use the provided GPS unit to navigate to each location.
- Some notes and examples provided within this guide are for the use of the adults leading the group. Please allow students to develop their own ideas and hypotheses.
- **OTHERS WILL USE THIS GUIDE, PLEASE DO NOT WRITE IN IT.**

HAVE FUN!

Heredity

Coordinates: N 41° 26.931', W 081° 42.905'

- Heredity is the passing of traits from parents to offspring.
- Zoos have the difficult job of creating successful breeding programs for their animals, primarily those that have become endangered. What factors could affect how a Species Survival Plan (SSP) decides which animals should participate in a breeding program?
- Find the “Rhinceros Attributes” index cards within your inquiry backpack. Each student should get one card. There are 12 cards in the set. If there are more than 12 students in your group, have them pair up and share cards. There are also multiple sets of attribute cards available in your inquiry backpack.
- The goal of this activity is to determine how difficult it might be to choose individual animals to participate in a breeding program.
- Students should review their card to discover what attributes they have.
- Have students stand in two teams. One team represents a “male” population of rhinos, and the other team represents the “female” population of rhinos. Teams do not necessarily need to be of equal size or divided by student gender.

- Read each of the following scenarios to the students. After each scenario, students must decide if any of the cards should be eliminated. Students holding eliminated cards should sit and continue paying attention to the remaining scenarios.
 - ✓ Several rhinos have been exposed to a rhino that died from an easily transmitted disease. That rhino initially did not show any symptoms, but later fell ill and died.
 - ✓ SSP advisors are hoping to create more genetic diversity within the captive population of rhinos. It can be beneficial to choose a captive born rhino with a known life history, but bringing in a wild born rhino could potentially create a new genetic “bloodline”.
 - ✓ Rhino mating can sometimes be a fairly violent event which involves a lot of pushing, shoving, and butting with horns. Mates can inflict mortal injuries on one another. Physically strong rhinos will come out of these battles fine, while rhinos with general physical weaknesses may become injured and die.

- ✓ The current captive rhino population is full of individuals that are in some way related to each other. SSP advisors want to determine which rhinos should be targeted for breeding in order to maintain the most genetically diverse population possible.
- After all scenarios have been read, discuss the potential outcomes with your students. Who is sitting and why? Who is left standing? What could your results mean for a zoo or SSP? Use the **Data Sheet** on the provided clipboard inside of your Inquiry Backpack to record your results.

Genetic Variation

Coordinates: N 41° 26.622', W 081° 43.013'

- Genetic variation is a change or difference in the genes between members of the same species, or between groups of species living in different parts of the world.
- Individual animals of the same species appear differently, just as each person in your group looks different from another. Good observational skills can help you find these variations.
- Make a prediction. Zookeepers must be able to identify individual animals in order to provide proper care. How might a keeper be able to tell the difference between each animal?
- Have each student choose a primate exhibit to observe. There must be at least three individuals of the same species visible. Multiple students may observe the same species.
- Find the animals in the exhibit you have chosen and stand where you can easily observe as many individuals as possible. Try to identify distinguishing features that would help you tell each animal apart.
- Record your list of similarities and/or differences on the **Data Sheet**.
- Discuss your results with the rest of your group. How and why do you think genetic variation exists? Can you identify any ways that might help a keeper recognize each animal?

Animal Behavior

Coordinates: N 41° 26.790', W 081° 42.774'

- Scientists regularly observe animals and record their behavior to see how they are spending their time.
- What do you think the elephants will spend the most time doing?
 - ✓ Make a **hypothesis**. There are no wrong guesses.
- Now help to find out the answer...
- Find the elephants in the exhibit and go stand where you can easily observe as many of them as possible.
 - ✓ Willy – largest elephant, missing right tusk.
 - ✓ Shenga – tallest female, question mark-shaped tail, tear at tip of trunk.
 - ✓ Kallie – head hangs low on shoulders, missing finger-like projection on tip of trunk, large head.
 - ✓ Martika – most hair on top of head, even length tusks.
 - ✓ Moshi – shortest elephant, no hair at end of tail.
- Use the **African Elephant Ethogram** in this guide to aid in recording your observed behaviors.

- For 10 minutes, watch each elephant and record their behavior. Time and behavior should be recorded **EACH MINUTE ON THE MINUTE**.
- Scientists do these types of observations over **LONG** periods of time. Continue taking observations for another 10 minutes. If you feel as though your group needs a break, move on to the Get-Close Encounter and return after to complete the final 10 minutes of observations.
- Use the **Data Sheet** on the provided clipboard inside of your Inquiry Backpack to record your observations.

Get-Close Encounter

- Elephants share their habitat with humans and many other types of animals.
- Find the Zoo volunteer holding an African animal. They may be outside in the Kgotla or inside the Sydell L. Miller Elephant Care & Visitor Center.
- Go over to meet this volunteer and their animal. They will speak with your group about the animal.
- If your group has not already completed 20 minutes of observation, **REMEMBER** to go back and complete the final 10 minutes.

Reporting Your Data

- An important part of being a scientist at the Zoo is to be sure to add **YOUR** findings to the findings of other scientists.
- Use the iPad inside the inquiry backpack to enter your observations from the **Animal Behavior Data Sheet**.
- Enter your data by following the prompts in the “Reporting Your Data” section of the app.
 - ✓ Your findings will be added to our Master Database, a place that we store **ALL** of the data collected by scientists just like you!
- Was your original hypothesis proven or disproven? Can you think of any reasons why your hypothesis might have been disproven?
- Take your **Animal Behavior Data** sheet back to school. Visit www.clemetzoo.com to find the **Collected Elephant Observation Data – Grades 5 and 7** spreadsheet.
- How do your observations compare to the data that has already been collected by other groups? What factors might contribute to different groups seeing other elephant behaviors?

African Elephant Ethogram

Behavior	Abbreviation	Description
Crossing Legs	CL	Elephant is resting with its legs crossed
Standing	STA	Elephant is in upright position, not moving
Walking	WA	Elephant is moving at a steady pace
Running	RU	Elephant is moving at a quick pace
Eating	EA	Elephant is using trunk to place food in mouth
Drinking	DR	Elephant is using trunk to place water in mouth
Defecating	DE	Elephant is standing, expelling feces
Urinating	UR	Elephant is standing, expelling urine
Swinging Trunk	ST	Elephant is swinging its trunk left and right
Trunk Searching	TS	Elephant is using its trunk to search for objects
Trunk Holding	TH	Elephant is holding an object with its trunk
Flapping Ears	FE	Elephant's ears are moving back and forth
Throwing Mud	TM	Elephant is throwing dirt or mud on its body
Bathing	BA	Elephant is in the water or spraying itself with water
Rubbing Rocks	RR	Elephant is rubbing its side against large rocks
Touching Trunks	TT	Elephant is using trunk to touch another elephant
Sleeping	SL	Elephant appears to be asleep, eyes closed
Laying Down	LD	Elephant is laying down on its side
Bobbing	BO	Elephant is bobbing its head up and down
Swaying	SW	Elephant is swaying its head or body left and right
Trumpeting	TR	Elephant is making a loud noise with its trunk
Out Of View	OV	Elephant is not visible to make an observation
Other Behavior	Other	Any other behavior not listed

Heredity/Genetic Variation Data

What factors could affect how a Species Survival Plan (SSP) decides which animals should participate in a breeding program?

What could the results of your “Rhino Attributes” activity mean for a zoo or SSP?

How might a keeper be able to tell the difference between each animal they care for?

What similarities and/or differences did you observe between individuals of the same species?

Can you identify any ways that might help a keeper recognize each animal of the same species?

Animal Behavior Data

Are you observing indoors or outdoors? _____ Date _____

Weather Conditions _____

Start Time _____ End Time _____

Other Conditions _____

Time	Willy	Shenga	Kallie	Martika	Moshi
0					
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					

Start Time _____ End Time _____

Time	Willy	Shenga	Kallie	Martika	Moshi
0					
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					

Return Your Backpack

- Now that you have completed your exploration of Cleveland Metroparks Zoo, we would like to thank you for participating in our *Collaborative Inquiry Project*.
- Please remember to **RETURN THE ENTIRE BACKPACK AND ALL OF ITS CONTENTS** to the lock box where you picked it up.



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