

# Teaching Activity Guide for

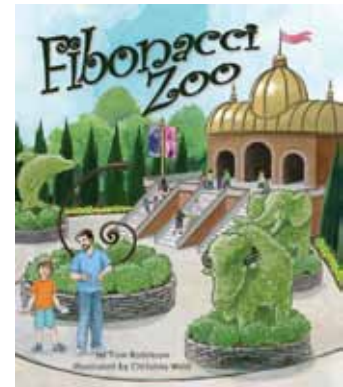
# Fibonacci Zoo



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# How to Use This Activity Guide (General)

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There are a wide variety of activities that teach or supplement all curricular areas. The activities are easily adapted up or down depending on the age and abilities of the children involved. And, it is easy to pick and choose what is appropriate for your setting and the time involved. Most activities can be done with an individual child or a group of children.

**For teachers in the classroom:** We understand that time is at a premium and that, especially in the early grades, much time is spent teaching language arts. All Arbordale titles are specifically selected and developed to get children excited about learning other subjects (science, geography, social studies, math, etc.) while reading (or being read to). These activities are designed to be as comprehensive and cross-curricular as possible. If you are teaching sentence structure in writing, why not use sentences that teach science or social studies? We also know and understand that you must account for all activities done in the classroom. While each title is aligned to all of the state standards (both the text and the For Creative Minds), it would be nearly impossible to align all of these activities to each state's standards at each grade level. However, we do include some of the general wording of the CORE language arts and math standards, as well as some of the very general science or social studies standards. You'll find them listed as "objectives" in italics. You should be able to match these objectives with your state standards fairly easily.

**For homeschooling parents and teachers in private schools:** Use as above. Aren't you glad you don't have to worry about state standards?

**For parents/caregivers:** Two of the most important gifts you can give your child are the love of reading and the desire to learn. Those passions are instilled in your child long before he or she steps into a classroom. Many adults enjoy reading historical fiction novels . . . fun to read but also to learn (or remember) about historical events. Not only does Arbordale publish stories that are fun to read and that can be used as bedtime books or quiet "lap" reading books, but each story has non-fiction facts woven through the story or has some underlying educational component to sneak in "learning." Use the "For Creative Minds" section in the book itself and these activities to expand on your child's interest or curiosity in the subject. They are designed to introduce a subject so you don't need to be an expert (but you will probably look like one to your child!). Pick and choose the activities to help make learning fun!

**For librarians and bookstore employees; after-school program leaders; and zoo, aquarium, nature center, park & museum educators:** Whether reading a book for story time or using the book to supplement an educational program, feel free to use the activities in your programs. We have done the "hard part" for you.

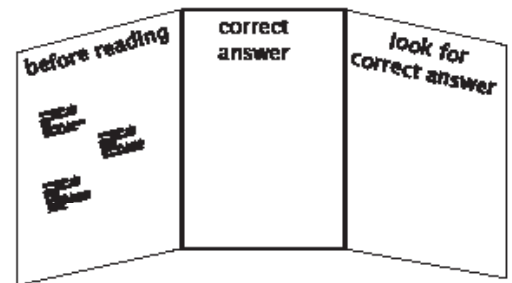
# What Do Children Already Know?

Young children are naturally inquisitive and are sponges for information. The whole purpose of this activity is to help children verify the information they know (or think they know) and to get them thinking “beyond the box” about a particular subject.

Before reading the book, ask the children what they know about the subject. A list of suggested questions is below. The children should write down their “answers” (or adults for them if the children are not yet writing) on the chart found in Appendix A, index cards, or post-it notes.

Their answers should be placed on a “before reading” panel. If doing this as a group, you could use a bulletin board or even a blackboard. If doing this with individual children, you can use a plain manila folder with the front cover the “before reading” panel. Either way, you will need two more panels—one called “correct answer” and the other “look for correct answer.”

Do the children have any more questions about the subject? If so, write them down to see if they are answered in the book.



After reading the book, go back to the questions and answers and determine whether the children’s answers were correct or not.

If the answer was correct, move that card to the “correct answer” panel. If the answer was incorrect, go back to the book to find the correct information.

If the children have more questions that were not answered, they should look them up.

When an answer has been found and corrected, the card can be moved to the “correct answer” panel.

# Pre-Reading Questions

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1. What kind of animals might you see in a zoo?
2. What is a number pattern?
3. Can you make number patterns with addition?
4. Can you make number patterns with multiplication?
5. Are there any number patterns that appear in nature?

# Comprehension Questions & Writing Prompts

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*Explain major differences between books that tell stories and books that give information, (paired fiction & For Creative Minds non-fiction)*

*Compare and contrast the most important points presented by two texts on the same topic. (story versus For Creative Minds non-fiction component)*

*With prompting and support, identify basic similarities in and differences between two texts on the same topic.*

*Ask and answer questions about key details in a text read aloud or information presented orally or through other media.*

*Confirm understanding of a text read aloud or information presented orally or through other media by asking and answering questions about key details and requesting clarification if something is not understood.*

*Recount or describe key ideas or details from a text read aloud or information presented orally or through other media.*

*Retell stories, including key details, and demonstrate understanding of their central message or lesson.*

1. Is this story fiction or non-fiction? How can you tell?
2. Is the “For Creative Minds” section fiction or non-fiction? How can you tell?
3. Eli found a number pattern in the zoo. Can you use number patterns to describe anything around you?
4. Tell someone a story that uses a number pattern. Can they guess what the pattern is?
5. Have you ever been to a zoo? Write about animals you have seen at a zoo or an animal you would like to see someday.
6. When Eli realized what the number pattern was, did he wait to see what the next number was or did he guess (predict) what it would be?
7. What did you learn about number patterns in the story?
8. What did you learn about number patterns in the “For Creative Minds”?
9. Tell this story to somebody else. Can they guess the number pattern?
10. Do you notice a pattern with the animals in the book? After the iguanas on the last page, what letter do you think the next animal’s name will start with?

# Observation Skills: Art Scavenger Hunt

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*Objective Core Language Arts Integration of Knowledge and Ideas: Use information gained from illustrations (e.g., maps, photographs) and the words in a text to demonstrate understanding of the text (e.g., where, when, why, and how key events occur).*

*Distinguish between information provided by pictures or other illustrations and information provided by the words in a text.*

*Explain how specific aspects of a text's illustrations contribute to what is conveyed by the words in a story (e.g., create mood, emphasize aspects of a character or setting).*

*Use illustrations and details in a story to describe its characters, setting, or events.*

Look at the illustrations in the book. Can you find:

- a woman wearing sunglasses
- a habitat (place where an animal lives) filled with sand
- a boy with red shoes and a blue backpack
- a water fountain
- a woman wearing a head-scarf or hijab
- a walking bridge
- a cheeseburger
- a recycling bin
- a waterfall
- a building with glass walls

# Language Arts & Science: Basic Needs

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*Objective: Describe the basic needs of living things and how they are met.*

*Plants need water, oxygen, food, light and space to grow and reproduce; animals need water, oxygen, food, and shelter/space to grow and reproduce.*

Re-read the story and write down any words that relate to how the plants or animal(s) meet their basic needs.

If not mentioned in the text, are there any indications in the illustrations of how these needs are met? Can you describe, draw, or write an explanation of how the needs are met?

<b>Animal</b>	<b>water</b>	<b>oxygen</b>	<b>food</b>	<b>light</b>	<b>space</b>



# Cross-Curricular Vocabulary Activities

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## *Objective Core Language Arts:*

*Determine or clarify the meaning of unknown and multiple-meaning words and phrases based on grade-level reading and content.*

*Identify new meanings for familiar words and apply them accurately (e.g., duck is a bird & the verb to duck).*

*Use words & phrases acquired through conversations, reading/being read to, and responding to texts.*

*Determine the meaning of general academic and domain-specific words and phrases in a text relevant to a grade-level topic or subject area.*

*Explain the function of nouns, pronouns, verbs, adjectives, and adverbs in general and their functions in particular sentences.*

*Write informative/explanatory texts in which they introduce a topic, use facts and definitions to develop points, and provide a concluding statement or section.*

*Use frequently occurring adjectives.*

**Vocabulary Game:** This activity is a very general idea and is designed to get children thinking of vocabulary words that will then be used as the beginning vocabulary list for a science lesson.

Select an illustration from the book and give the children a specific length of time (five minutes?) to write down all the words they can think of about the particular subject. It is helpful to project an illustration on a whiteboard. Use eBook or book preview found at [www.ArbordalePublishing.com](http://www.ArbordalePublishing.com).

The children's word list should include anything and everything that comes to mind, including nouns, verbs, and adjectives. At the end of the time, have each child take turns reading a word from his/her list. If anyone else has the word, the reader does nothing. However, if the reader is the only one with the word, he/she should circle it. While reading the list, one person should write the word on a flashcard or large index card and post it on a bulletin board or wall.

At the end, the child with the most words circled "wins." And you have a start to your science vocabulary list. Note: if a child uses an incorrect word, this is a good time to explain the proper word or the proper usage.

**Glossary/Vocabulary Words:** Word cards may be used (see Appendix) or have children write on index cards, a poster board, or on a chalkboard for a "word wall." If writing on poster board or chalkboard, you might want to sort words into nouns, verbs, etc. right away to save a step later if using for Silly Sentences (on the next page). Leaving the words posted (even on a refrigerator at home) allows the children to see and think about them frequently. The glossary has some high-level words. Feel free to use only those words as fit your situation.

**Using the Words:** The following activities may be done all at once or over a period of several days.

- Sort vocabulary words into nouns, verbs, adjectives, etc. and write what they are on the backs of the cards. When the cards are turned over, all you will see is "noun," etc. (these can then be used for the "silly sentences" on the next page).
- After the cards have been sorted, go over the categories to ensure that all cards have been placed correctly. (Mistakes are a great opportunity to teach!)
- Choose two words from each category and write a sentence for each word.
- Write a story that uses at least ten vocabulary words from the word sort.
- Have children create sentences using their vocabulary words. Each sentence could be written on a separate slip of paper. Have children (individually or in small groups) sort and put sentences into informative paragraphs or a story. Edit and re-write paragraphs into one informative paper or a story.

**Silly Sentence Structure Activity:** This "game" develops both an understanding of sentence structure and the science subject. Use words from the "word wall" to fill in the blanks. After completing silly sentences for fun, have children try to fill in the proper words by looking for the correct information in the book.

# Word Bank

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Use words from the book to create a word bank.

Adjective	Noun			Verb

# Cross-Curricular: Silly Sentences

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1. He brought a \_\_\_\_\_ to record what he \_\_\_\_\_.  
noun verb
2. He pulled out his notebook and \_\_\_\_\_: "1 alligator."  
verb
3. Again Eli looked but \_\_\_\_\_ could see only one.  
noun
4. Eli wondered why there were so \_\_\_\_\_ animals in this zoo.  
adjective
5. Next they \_\_\_\_\_ a tank of water.  
verb
6. They swished their \_\_\_\_\_ and \_\_\_\_\_ their trunks.  
noun verb
7. Eli recognized flamingos and quickly \_\_\_\_\_ eight of them.  
verb
8. "Hey, Dad, look at this!" \_\_\_\_\_ exclaimed.  
noun
9. I \_\_\_\_\_ there's a pattern.  
verb
10. They heard the \_\_\_\_\_ group of animals long before they reached them.  
adjective
11. Twenty-one \_\_\_\_\_ creatures lay in a \_\_\_\_\_ pond.  
adjective adjective
12. He had \_\_\_\_\_ the secret of the Fibonacci Zoo.  
verb
13. Can you \_\_\_\_\_?  
verb

# Language Arts: Word Families & Rhyming Words

*Language Arts, Reading Standards: Foundational Skills, Recognize and produce rhyming words.*  
Word families are groups of words that have some of the same combinations of letters in them that make them sound alike...or rhyme. For example ad, add, bad, brad (Brad), cad, Chad, clad, dad, fad, gad, glad, grad, had, lad, mad, pad, plaid (silent "i"), sad, shad, and tad all have an "ad" letter combination and rhyme.

- Find and write down rhyming words in the poem.
- Are they in the same word family?
- If so, circle the combination of letters that are the same.
- Can you think of more words in the word family?

Rhyming words are:

**wait**

and

**gate**

They are / are not from the same word family.

Other words that rhyme are:

Rhyming words are:

**lay**

and

**stay**

They are / are not from the same word family.

Other words that rhyme are:

Rhyming words are:

**tree**

and

**see**

They are / are not from the same word family.

Other words that rhyme are:

Rhyming words are:

**word**

and

**bird**

They are / are not from the same word family.

Other words that rhyme are:

# Language Arts: Sequence Sentence Strips

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Cut into sentence strips, laminate if desired, and place in a "center." Have children put the events in order. Children may work alone or in small groups. Cards are in order but should be mixed up when cut apart.

*Objective Core Language Arts:*

*Use temporal words and phrases to signal event order.*

*Describe the overall structure of a story, including describing how the beginning introduces the story and the ending concludes the action.*

Eli entered the zoo and saw an alligator swimming in a shallow lake.

Leaving the alligator, he discovered a bison out sunning himself.

He and his father left the bison and saw two hairy camels standing near a pond.

Next they found a tank of water. The animals inside were swimming and jumping into the air. When all three soared above the wall, Eli recognized the dolphins.

After a short walk through some trees, Eli and his father saw five large creatures. They moved in a familiar way. They swished their tails and swung their trunks. These were elephants.



Soon tall pink birds stood on long legs. Eli recognized flamingos and quickly counted eight of them.

They heard the next group of animals long before they reached them. Sitting under some trees were thirteen gorillas.

Looking in his notebook, Eli saw that the next exhibit should contain twenty-one animals. He was right. Twenty-one enormous creatures lay in a shallow pond. This was the hippopotamus exhibit.

He couldn't wait to see how many animals would be in its next exhibit.

Can you guess?

# Word Search

Find the hidden words. Even non-reading children can match letters to letters to find the words! Easy—words go up to down or left to right (no diagonals). For older children, identify the coordinates of the first letter in each word (number, letter).

	A	B	C	D	E	F	G	H	I	J
1	G	Q	T	Y	U	M	A	E	C	L
2	W	I	C	A	M	E	L	L	O	J
3	N	O	T	E	B	O	O	K	M	I
4	E	V	R	I	A	P	R	V	Z	C
5	C	E	B	L	Z	A	C	K	O	S
6	A	F	I	B	O	N	A	C	C	I
7	V	M	S	E	O	B	D	A	W	K
8	E	I	O	O	W	I	L	O	C	M
9	T	G	N	F	I	B	E	I	V	O
10	F	R	I	N	I	G	U	A	N	A

BISON  
CAMEL  
FIBONACCI  
IGUANA  
NOTEBOOK  
ZOO

# Edible Sorting and Classifying Activity

---

*Objective Core Language Arts Vocabulary Acquisition and Use: Sort common objects into categories (e.g., shapes, foods) to gain a sense of the concepts the categories represent.*

*Objects and materials can be sorted and described by their properties. (color, shape, size, weight and texture)*

*Use whole numbers\*, up to 10, in counting, identifying, sorting, and describing objects and experiences.*

Gather a cup of edible “sorting items.” For example:

- As many different kinds of M&Ms as you can find
- Chocolate & peanut butter chips
- Hershey Kisses
- Peanuts or other type of nuts



Ask the children to sort the items into groups. There is no right and wrong, only what makes sense to the child. When finished, ask the child:

What feature or attribute (color, size, ingredient, etc.) did you use to sort the items?

- Were there some items that fit more than one group or don't fit any group?
- If so, how did the child decide which attribute was more important?
- How are various objects similar and different?
- Was it easy to sort or were there some items that were a little confusing?

If more than one person did this, did everyone sort by the same attribute? To extend the learning, graph the attributes used to sort the items (blank graph below).

Graph the attributes that children used to sort their items. (Graph provided on next page.)

What was the most common attribute (size, shape, color, etc.) used?



*Objective: Classify organisms according to one selected feature, such as body covering, and identify other similarities shared by organisms within each group formed.*

*Describe several external features and behaviors of animals that can be used to classify them (e.g., size, color, shape of body parts).*

*Identify observable similarities and differences (e.g., number of legs, body coverings, size) between/ among different groups of animals.*

10				
9				
8				
7				
6				
5				
4				
3				
2				
1				
attribute				

# Classifying Animals

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*Objective: Classify organisms according to one selected feature, such as body covering, and identify other similarities shared by organisms within each group formed.*

*Describe several external features and behaviors of animals that can be used to classify them (e.g., size, color, shape of body parts).*

*Identify observable similarities and differences (e.g., number of legs, body coverings, size) between/among different groups of animals.*

Just as we sort candy, scientists sort all living things into groups to help us understand and connect how things relate to each other. Scientists ask questions to help them sort or classify animals.

Based on the answers to the questions, scientists can sort the living organisms. The first sort is into a Kingdom. There are five commonly accepted Kingdoms: Monera, Protista, Fungi, Plantae, and Animalia. All of the living things in this book belong to Animalia or the Animal Kingdom.

The next big sort is into a Phylum. One of the first questions that a scientist will ask is whether the animal has (or had at some point in its life) a backbone. If the answer is “yes,” the animal is a vertebrate. If the answer is “no,” the animal is an invertebrate.

Each Phylum is broken down into Classes, like mammals, birds, reptiles, fish, amphibians, insects, or gastropods (snails). Then each class can be broken down even further into orders, families, genus and species, getting more specific.


The scientific name is generally in Latin or Greek and is the living thing’s genus and species. People all over the world use the scientific names, no matter what language they speak. Most living organisms also have a common name that we use in our own language.



Some questions scientists ask:



- Does it have a backbone?
- What type of skin covering does it have?
- Does it have a skeleton? If so, is it inside or outside of the body?
- How many body parts does the animal have?
- Does it get oxygen from the air through lungs or from the water through gills?
- Are the babies born alive or do they hatch from eggs?
- Does the baby drink milk from its mother?
- Is it warm-blooded or cold-blooded?

Using what you know, and information and pictures in the book, see how many Animal Chart squares you can fill in for each animal.

# Animal Chart

	Animals		
<b>Appendages</b>	legs (how many)		
	flippers/fins		
	wings		
	tail/no tail		
	horns/antlers		
<b>Feet or hands: if they have; may have more than one</b>	claws		
	web		
	toes		
	opposable thumbs/toes		
	hooves		
<b>Movement: may do more than one</b>	walks/runs		
	crawls		
	flies		
	slithers		
	swims		
	climbs		
	hops		
<b>Backbone</b>	backbone/vertebrate		
	no backbone/invertebrate		
<b>Skeleton</b>	inside skeleton (endoskeleton)		
	outside skeleton (exoskeleton)		
	no skeleton		
<b>Body covering</b>	hair/fur/whiskers/quills		
	feathers		
	dry scales or bony plates		
	moist scales		
	smooth, moist skin		
	hard outer shell		
<b>Color/patterns</b>	stripes or spots		
	mostly one color		
	skin color changes		
	bright, vivid colors		
<b>Gets oxygen</b>	lungs		
	gills		
<b>Body temperature</b>	warm-blooded (endothermic)		
	cold-blooded (ectothermic)		
<b>Babies</b>	born alive		
	hatch from eggs		
	born alive or hatch from eggs		
<b>Metamorphosis</b>	complete		
	incomplete		
	none		
<b>Teeth</b>	sharp		
	flat		
	no teeth (bill/beak)		
<b>Food</b>	plant eater (herbivore)		
	meat eater (carnivore)		
	both (omnivore)		

	Animals		
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<b>Body covering</b>	hair/fur/whiskers/quills		
	feathers		
	dry scales or bony plates		
	moist scales		
	smooth, moist skin		
	hard outer shell		
	hard outer covering		
<b>Color/patterns</b>	stripes or spots		
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	meat eater (carnivore)		
	both (omnivore)		

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	flat		
	no teeth (bill/beak)		
<b>Food</b>	plant eaters (herbivore)		
	meat eater (carnivore)		
	both (omnivore)		

# Vertebrate Classes

Objective: Compare structures (e.g., wings vs. fins vs. legs; gills vs. lungs; feathers vs. hair vs. scales) that serve similar functions for animals belonging to different vertebrate classes



## Mammals:

hair, fur, whiskers, or quills at some point during their lives  
backbone (vertebrate)  
inside skeleton (endoskeleton)  
lungs to breathe  
most give birth to live young  
produce milk to feed young  
warm-blooded



## Birds:

feathers  
backbone (vertebrate)  
inside skeleton (endoskeleton)  
lungs to breathe  
hatch from hard-shelled eggs  
warm-blooded



## Reptiles:

dry scales or plates  
backbone (vertebrate)  
inside skeleton (endoskeleton); most turtles also have a hard outer shell  
lungs to breathe  
most hatch from leathery eggs  
cold-blooded



Warm-blooded animals make their own heat and have a constant body temperature

Cold-blooded animals' body temperature comes from their surroundings

## Fish:

most have scales covered with a thin layer of slime  
backbone (vertebrate)  
inside skeleton (endoskeleton)  
gills to breathe  
babies are either born alive or hatch from jellylike eggs  
cold-blooded

## Amphibians:

soft, moist skin  
backbone (vertebrate)  
inside skeleton (endoskeleton)  
most hatchlings (jellylike eggs) are called larvae or tadpoles and live in water, using gills to breathe  
as they grow, they develop legs and lungs and move onto land  
cold-blooded

Using the sorting cards, sort the animals into their class.

# Common Invertebrates

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## Arthropods: Insects:

- hard outer covering
- no backbone (invertebrate)
- outside skeleton (exoskeleton)
- adults have 3 body parts: head, thorax & abdomen
- mouthparts adapted for chewing, biting, sucking and lapping
- breathe through tracheae
- compound eyes
- 3 pairs of legs
- usually 2 pairs of wings and 1 pair of antennae
- most hatch from eggs
- metamorphosis: none, incomplete, or complete
- cold-blooded

## Mollusks Bi-valves:

- have a two-part shell with a hinge to open/close
- no backbone (invertebrate)
- outside skeleton (exoskeleton)
- hatch from eggs
- cold-blooded
- marine and freshwater
- symmetry:

## Mollusks

### Gastropods (Snails):

- most have hard shells
- no backbone (invertebrate)
- outside skeleton (exoskeleton)
- hatch from eggs
- cold-blooded

## Arthropod

### Arachnia (Spiders):

- no backbone
- one or two body segments
- pincers or fangs near mouth
- 4 pairs of legs
- no antennae

## Arthropod

### Crustaceans (Crabs):

- hard outer covering
- no backbone (invertebrate)
- outside skeleton (exoskeleton)
- mouthparts adapted for chewing
- 5 or more pairs of legs
- claws
- 2 pairs of antennae
- 2 compound eyes on stalks
- adults have 2 or 3 body segments
- hatch from eggs
- cold-blooded

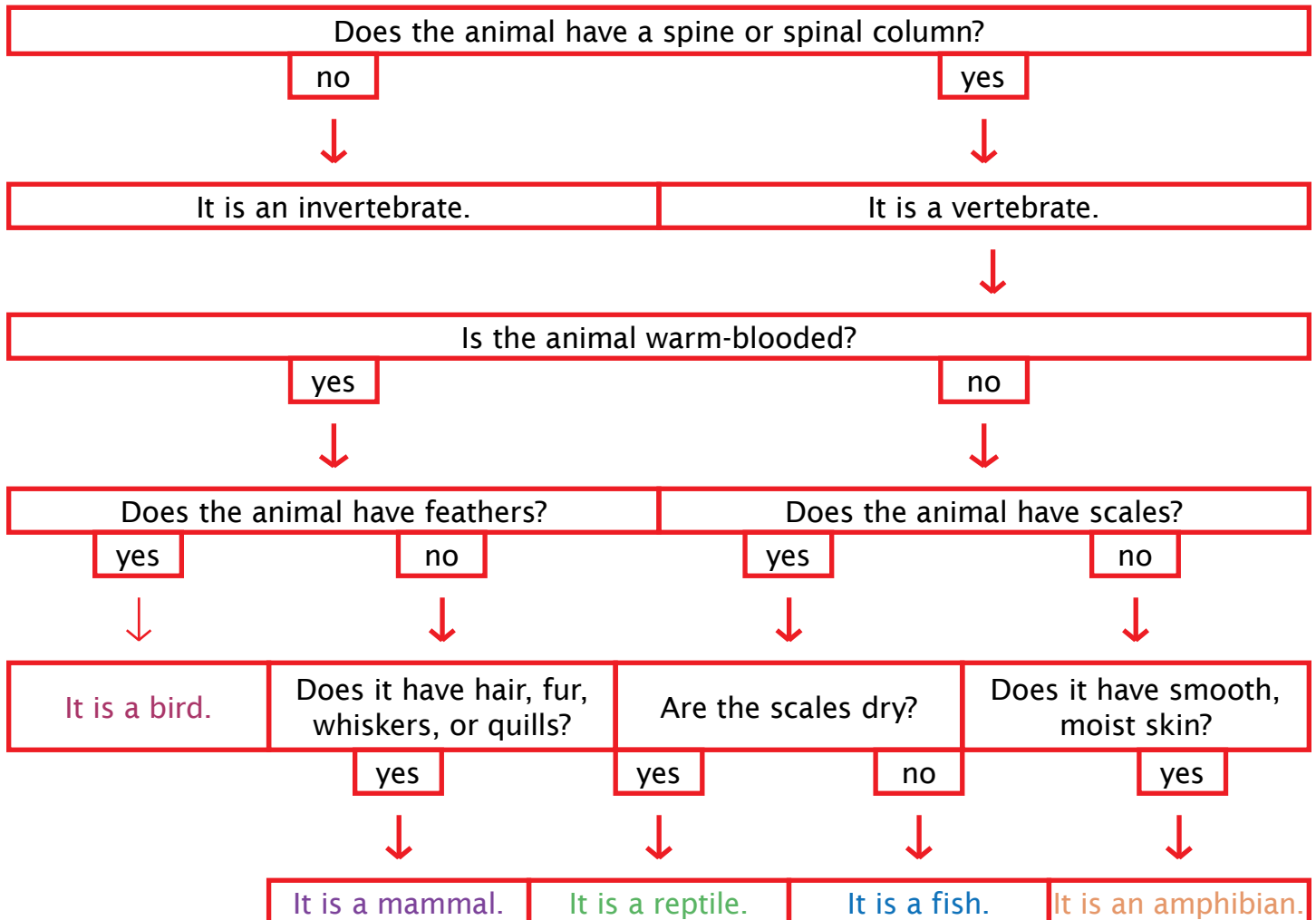
# Dichotomous (Yes/No) Key

A dichotomous key helps to sort (classify) animals. These keys work by asking yes or no questions. Each answer leads to another yes or no question, until the animal class is identified. There are five classes of animals with backbones (vertebrates): fish, reptiles, amphibians, birds, and mammals. Use the information found in the book to match the animal to its classification.

*Objective: Classify organisms according to one selected feature, such as body covering, and identify other similarities shared by organisms within each group formed.*

*Describe several external features and behaviors of animals that can be used to classify them (e.g., size, color, shape of body parts).*

*Identify observable similarities and differences (e.g., number of legs, body coverings, size) between/among different groups of animals.*





# Compare/Contrast: Animal and Human Senses

*Objective Core Language Literature 4: Identify words and phrases in stories or poems that suggest feelings or appeal to the senses.*

*Students know that senses can provide essential information (regarding danger, food, mates, etc.) to animals about their environment.*

*Identify the five senses and their related body parts: sight - eyes, hearing - ears, smell - nose, taste - tongue, touch - skin,*

*Identify the structures of living organisms and explain their function.*

Compare and contrast animal and human body parts used for senses.

to smell	to feel
to hear	to see

# Adaptations

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*Objective: Identify adaptations that help plants and animals survive and grow in their environment*

*Identify external parts of plants and animals*

*Observe and compare the structures and behaviors of different kinds of plants and animals*

Adaptations help animals to live in their habitat: to get food and water, to protect themselves from predators, to survive weather, and even to help them make their homes. Here are a few different types of adaptations.

## Physical Adaptations

Use the illustrations in the book to see how many physical adaptations you can see for each animal.

### body parts

teeth—depends on type of food eaten  
feet, flippers, fins—ability to move  
placement of eyes  
gills, lungs, or other—how does the animal get oxygen  
ears—or how the animal hears/senses

### body coverings

hair or fur  
feathers  
scales  
moist skin

### camouflage and protection

color of skin or pattern to blend into background  
body structure resembles another organism to fool predators  
poisonous or stinky smells

### Behavioral Adaptations

instinct: behaviors or traits that the animals are born with  
learned behavior: traits that animals learn to improve their chances of survival or to make their life easier  
social groups versus solitary living  
communication with other animals  
defense  
hiding in an area that provides camouflage  
reaction to cycles (day/night, seasons, tides, etc.)  
migration: the seasonal movement of animals from one location to another  
hibernation: a long, deep sleep in which the animal's breathing and heartbeat are slower than usual

Pick an animal from the book and answer the following questions:  
My animal is:

<p>Where (in what kind of habitat) does your animal live?</p>	<p>What is one of its physical adaptations and how does it help the animal live in its environment?</p>
<p>What is another of its physical adaptations and how does it help the animal live in its environment?</p>	<p>What is another of its physical adaptations and how does it help the animal live in its environment?</p>

What behavioral adaptations (if any) were mentioned in the story?

# Science Journal (Vocabulary)

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## pattern

my definition

my drawing

## ZOO

my definition

my drawing

# predict

my definition

my drawing

# discover

my definition

my drawing

# Math: Number Patterns

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If the Fibonacci Zoo had 26 animals, one starting with each letter of the alphabet, how long would it take to find an exhibit with more than 500 animals? More than 1,000? How many animals would be in the 26th exhibit?



alligator	1
bison	1
camel	2
dolphin	3
elephant	5
flamingo	8
gorilla	13
hippopotamus	21
iguana	34
jackal	55
kangaroo	89
llama	144
monkey	233
newt	377
owl	610
panda	987
quail	1,597
rhinoceros	2,584
sea lion	4,181
tiger	6,765
uakari	10,946
vampire bat	17,711
wallaby	28,657
x-ray tetra	46,368
yak	75,025
zebra	121,393

# Golden Ratio

The numbers of the fibonacci sequence give us the golden ratio. This number is found by dividing each number in the fibonacci sequence by the previous. The farther you go down the sequence dividing each number by the last, the closer you get to a certain number, approximately 1.62. This number is called “phi” and can be written as  $\Phi$  or  $\phi$ .


This golden ratio is in your body! Use a tape measure to measure yourself and answer the following division questions. Just like in plants, there is natural variation among humans. After using your own measurements, try measuring a group of people. The more people you compare, the more likely you will see the average number get close to Phi.

Your height from the ground to the top of your head.  $\div$  Distance from the top of your head to your fingertips. = \_\_\_\_\_



\_\_\_\_\_  $\div$  \_\_\_\_\_ = \_\_\_\_\_

The distance from the tip of your middle finger to your wrist.  $\div$  The distance from the tip of your middle finger to your elbow. = \_\_\_\_\_



# Math Cards

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*Objective Core Mathematics Classify objects into given categories; count the numbers of objects in each category and sort the categories by count. (up to 10)*

*Solve addition and subtraction word problems, and add and subtract within 10, e.g., by using objects or drawings to represent the problem.*

*Use numbers, up to 10, to place objects in order, such as first, second, and third, and to name them*

*For any number from 1 to 9, find the number that makes 10 when added to the given number, e.g., by using objects or drawings, and record the answer with a drawing or equation.*

## Math Card Games

(Make four copies of the math cards to play these games):

**Tens Make Friends Memory Game** is a combination of a memory and adding game.

- Play like the memory game, above.
- If the animal numbers add up to 10, the child keeps the pair and takes another turn.
- If they do not add up to ten, the player should turn the cards back over and it is another player's turn.

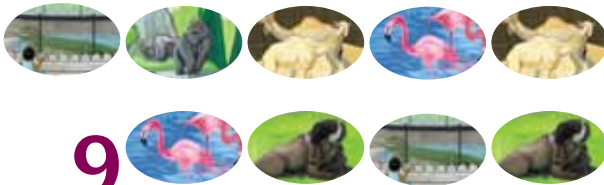
**Go Fish for Fact Families** is a twist on "Go Fish."

- Shuffle cards and deal five cards to each player. Put the remaining cards face down in a draw pile.
- If the player has three cards that make a fact family, he/she places them on the table and recites the four facts related to the family. For example, if someone has a 2, 3, and 5, the facts are:  $2 + 3 = 5$ ,  $3 + 2 = 5$ ,  $5 - 2 = 3$ ,  $5 - 3 = 2$ .
- The player then asks another player for a specific card rank. For example: "Sue, please give me a 6."
- If the other player has the requested card, she must give the person her card.
- If the person asked doesn't have that card, he/she says, "Go fish."
- The player then draws the top card from the draw pile.
- If he/she happens to draw the requested card, he/she shows it to the other players and can put the fact family on the table. Otherwise, play goes to the next person.
- Play continues until either someone has no cards left in his/her hand or the draw pile runs out. The winner is the player who then has the most sets of fact families.



<p>1</p> 	<p>2</p> 
<p>3</p> 	<p>4</p> 
<p>5</p> 	<p>6</p> 
<p>7</p> 	<p>8</p> 

9



# Guess the Pattern

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*Objective Core Mathematics*

Make a number pattern by marking numbers on the chart below. Swap pages with a friend. Can they figure out your number pattern? Can you figure out theirs?

0	1	2	3	4	5	6	7	8	9
10	11	12	13	14	15	16	17	18	19
20	21	22	23	24	25	26	27	28	29
30	31	32	33	34	35	36	37	38	39
40	41	42	43	44	45	46	47	48	49
50	51	52	53	54	55	56	57	58	59
60	61	62	63	64	65	66	67	68	69
70	71	72	73	74	75	76	77	78	79
80	81	82	83	84	85	86	87	88	89
90	91	92	93	94	95	96	97	98	99

# Map Activity

*Objective: reading maps, geography, know that plants and animals live in different locations*

Using these maps as a reference, color the areas where these animals live on the blank map (in appendix).



alligator



bison



camel



flamingo



gorilla

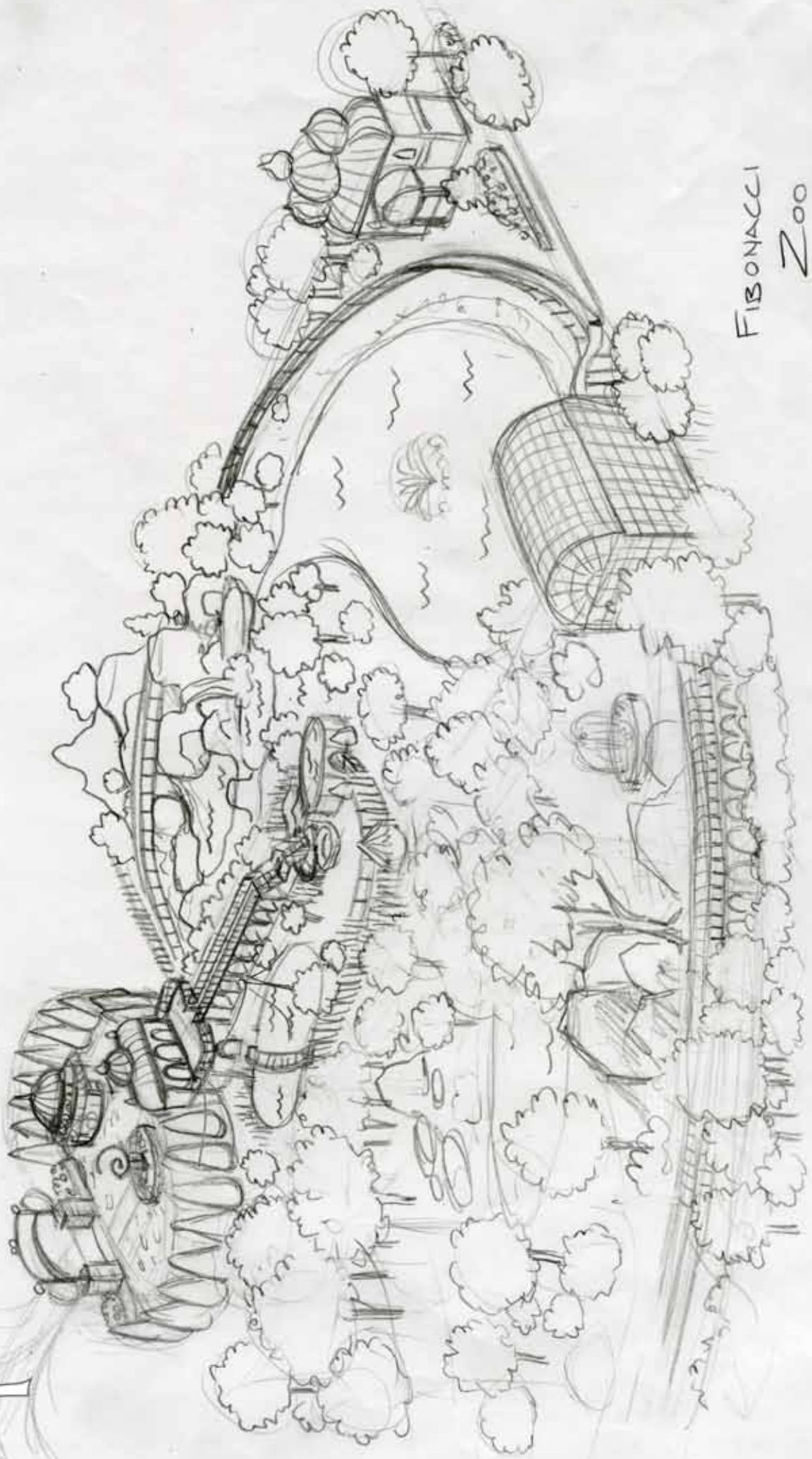
1. Which animals live in North America?
2. Which animals live in Africa?
3. Camels live on which two continents?
4. Which of these animals is found on four different continents: North American, South America, Africa, and Asia?
5. Which animal lives only in North America?
6. Which animal lives only in Africa?
7. Do any of these animals live in Australia?
8. Do any of these animals live in Antarctica?

# Coloring Pages

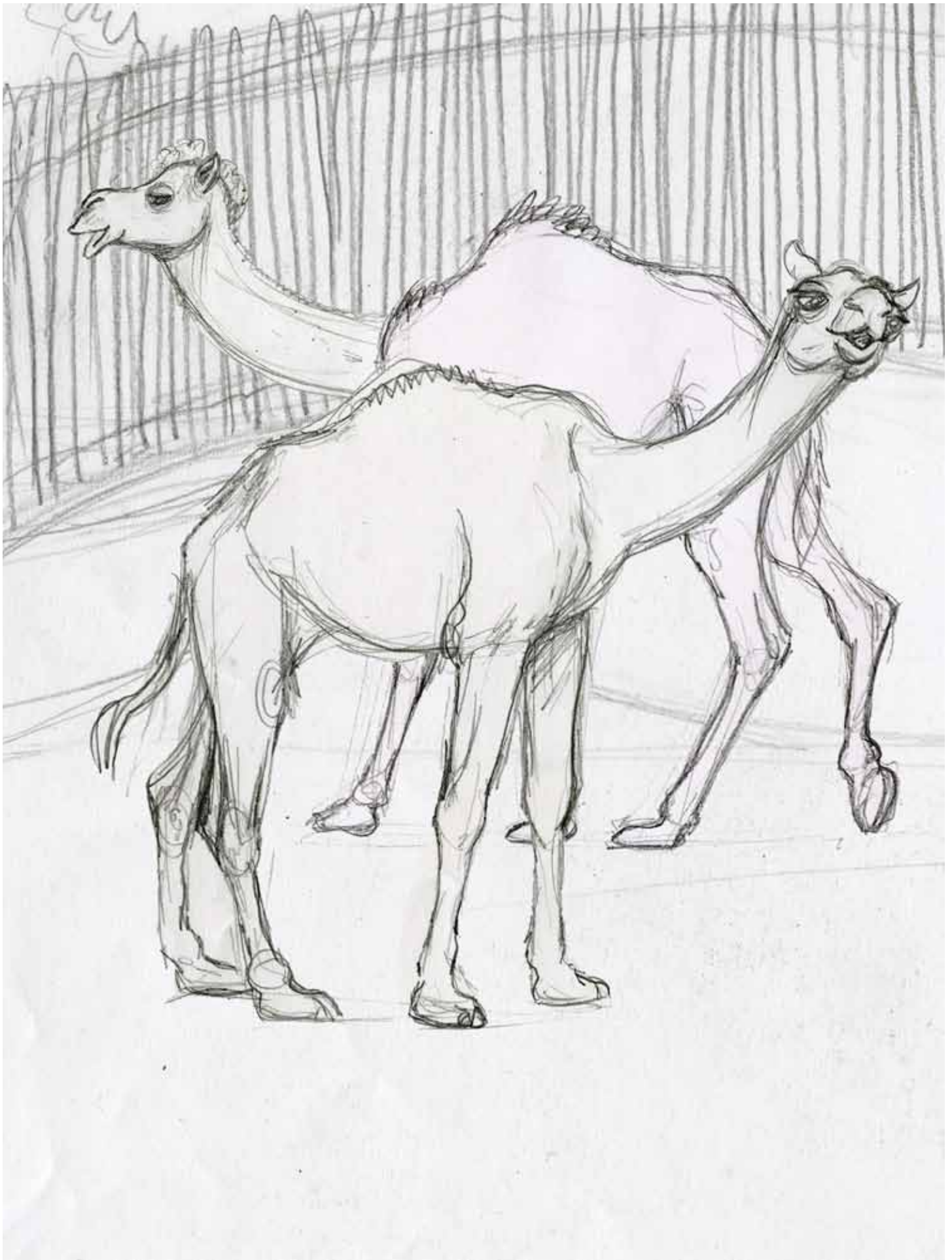
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Fibonacci Zoo

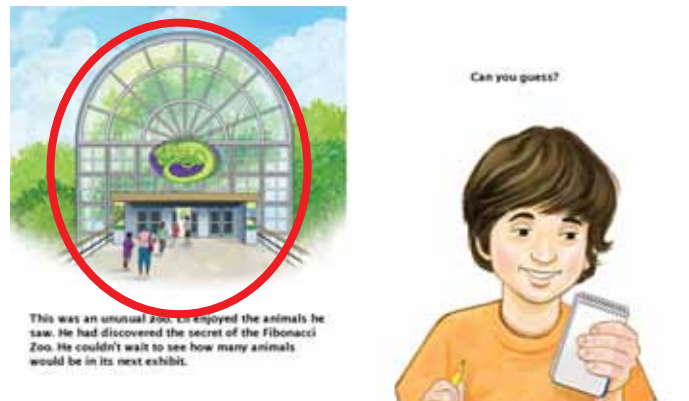
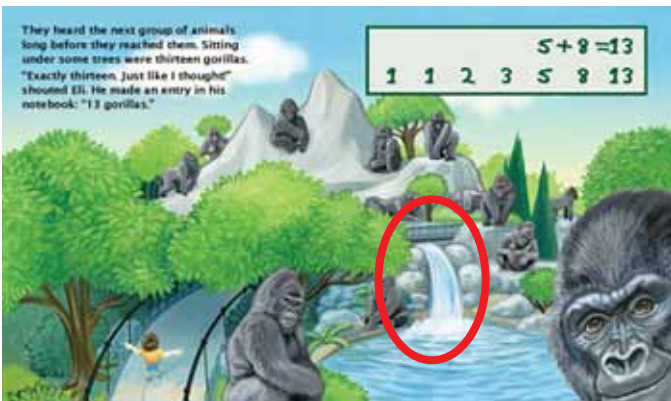
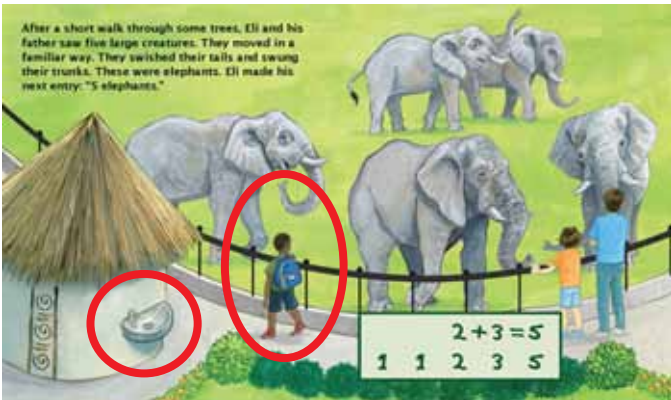
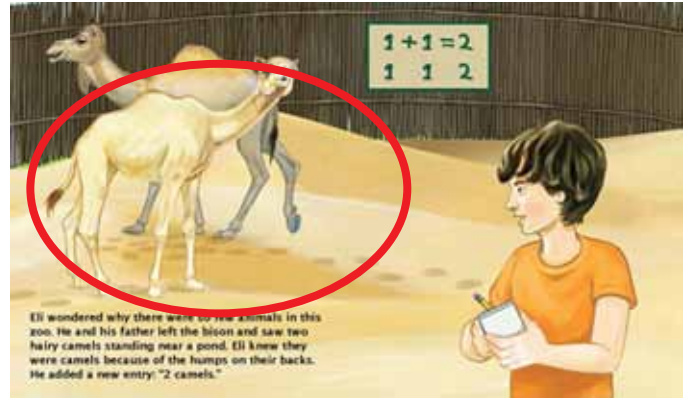
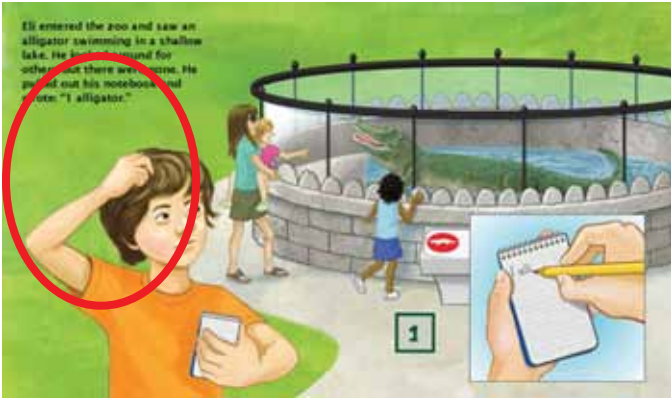


FIBONACCI  
ZOO



# Answers

## Art Scavenger Hunt Answers



## Silly Sentence Answers

1. He brought a notebook to record what he saw.
2. He pulled out his notebook and wrote: "1 alligator."
3. Again Eli looked but he could see only one.
4. Eli wondered why there were so few animals in this zoo.
5. Next they found a tank of water.
6. They swished their tails and swung their trunks.
7. Eli recognized flamingos and quickly counted eight of them.
8. "Hey, Dad, look at this!" Eli exclaimed.
9. I think there's a pattern.
10. They heard the next group of animals long before they reached them.
11. Twenty-one enormous creatures lay in a shallow pond.
12. He had discovered the secret of the Fibonacci Zoo.
13. Can you guess?

## Word Search Answers

	A	B	C	D	E	F	G	H	I	J		
1											BISON	5, C
2			C	A	M	E	L				CAMEL	2, C
3											FIBONACCI	6, B
4											IGUANA	10, E
5			B		Z						NOTEBOOK	3, 1
6		F	I	B	O	N	A	C	C	I	ZOO	5, E
7			S		O							
8			O									
9			N									
10					I	G	U	A	N	A		

## Map Activity Answers

1. Which animals live in North America? alligator, bison, flamingo
2. Which animals live in Africa? camel, flamingo, gorilla
3. Camels live on which two continents? Asia and Africa
4. Which of these animals is found on four different continents: North American, South America, Africa, and Asia? flamingo
5. Which animal lives only in North America? bison
6. Which animal lives only in Africa? gorilla
7. Do any of these animals live in Australia? no
8. Do any of these animals live in Antarctica? no



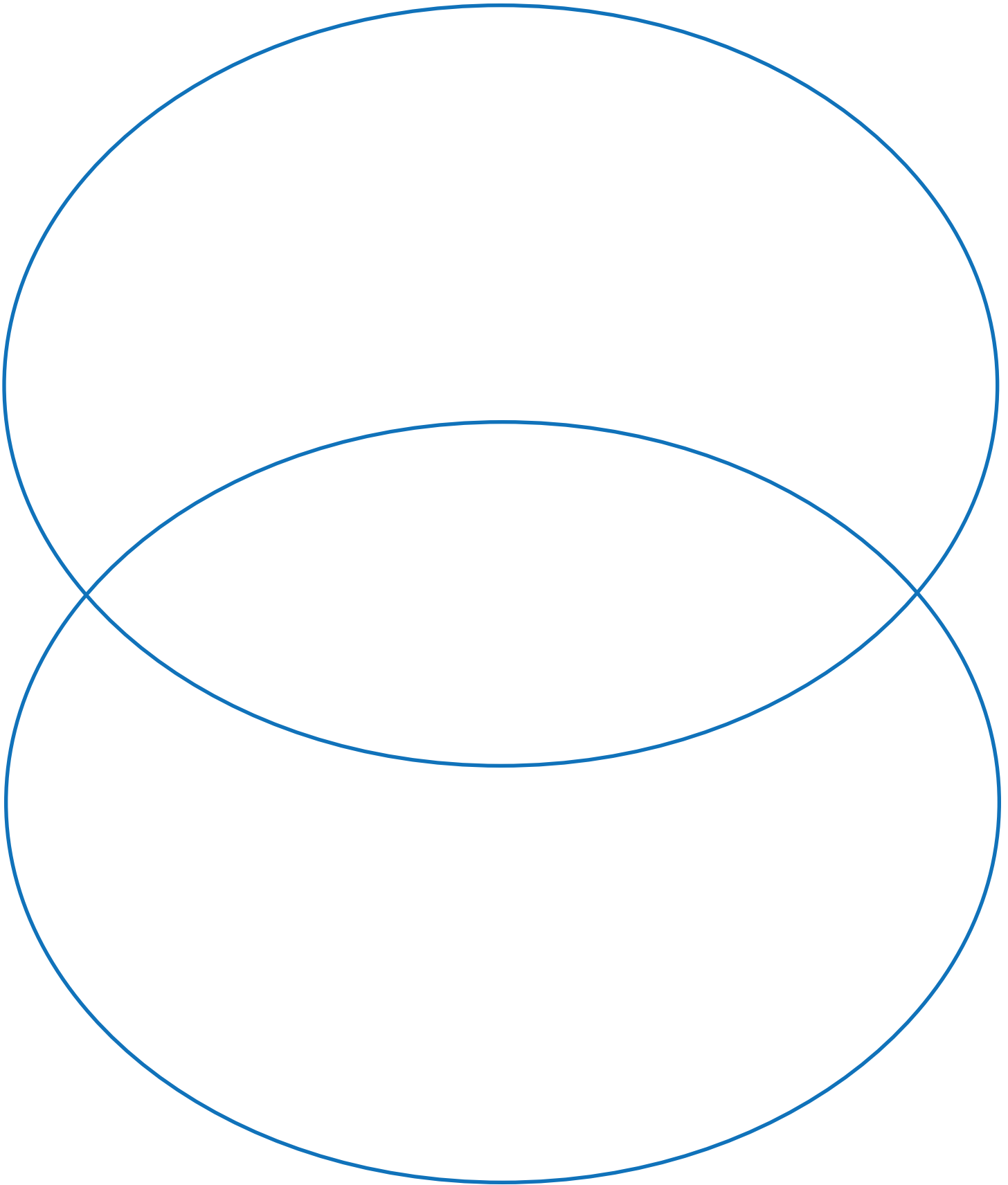
# Appendix A—“What Children Know” Cards

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<p>Question:</p>  <p>My answer:</p>    <p>This information is correct! This information is not correct; can you find the correct information?</p>	<p>Question:</p>  <p>My answer:</p>    <p>This information is correct! This information is not correct; can you find the correct information?</p>
<p>Question:</p>  <p>My answer:</p>    <p>This information is correct! This information is not correct; can you find the correct information?</p>	<p>Question:</p>  <p>My answer:</p>    <p>This information is correct! This information is not correct; can you find the correct information?</p>

# Appendix B—Venn Diagram

Compare and contrast two animals



# Appendix C—U.S. Map



# Appendix D—North America Map



# Appendix E—World Map



# Appendix F—Vocabulary Cards

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