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## ANIMAL BIOGRAPHY SERIES

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This series of books tells the story of one individual animal and how it interacts with its environment and people.



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### FOCUS: THE ANIMAL'S STORY

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The stories focus on the animal itself. While the animal comes in contact with humans at some point, they are secondary to the tale. Because children's picture books are only 32 pages and under 1000 words, they require a focus on a particular aspect of a story. Our focus is the story of the animal's life. However, we also recognize that humans do cause events in the animal's life, so we cover that in the back matter.

Books 1-4 include information on a bird, a mammal, an arachnid and an amphibian.

#### *ANIMAL BIOGRAPHY SERIES*

Book 1: *Wisdom, the Midway Albatross: Surviving the Japanese Tsunami and Other Disasters for Over 60 Years*

Book 2: *Abayomi, the Brazilian Puma: The True Story of an Orphaned Cub*

Book 3: *Nefertiti, the Spidernaut: How a Jumping Spider Learned to Hunt in Space*

Book 4: *Rosie the Ribeter: The Celebrated Jumping Frog of Calaveras County*

We provide here some lesson plan ideas based on the NGSS. Each lesson will mention the specific standards and suggest ways to extend the book with other activities.

## CLASSIFICATION OF ANIMALS

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Animals are often sorted into different classifications according to certain characteristics they hold in common. Within a species, there are individuals with their own characteristics. But overall, the animals have certain things in common with others in its classification.

### **NGSS STANDARDS:**

- Disciplinary Core Ideas: LS1.A (3-5), LS3.A (K-2) (3-5), LS3.B (3), LS4.B (3-5), LS4.C (3-5), LS4.D (K-2)(3-5)
- Science and Engineering Practices: 1-8
- Crosscutting Concepts: 1, 4, 6

### **Mammals**

- give birth to their young and feed them with milk.
- have hair on at least part of their body.
- have four limbs with digits ending in claws, nails, or hooves (except whales).
- breathe with lungs.
- are warm-blooded.

### **Birds**

- lay eggs with a hard shell.
- are covered with feathers.
- have a beak.
- have two legs.
- have two wings used for flying (ostriches and penguins are flightless).
- have hollow bones.
- are warm-blooded.

### **Reptiles**

- lay eggs with leathery shells or give birth to fully-formed young.
- breathe with lungs.
- are covered with scales.
- have no legs or four legs with clawed toes.
- are cold-blooded.

### **Amphibians**

- lay eggs, usually in a jelly-like mass in water.
- breathe with lungs, gills, and/or their skin.
- have smooth skin without coverings.
- have four legs without claws or nails on toes.
- are cold-blooded.

### **Insects**

- have three body parts: head, thorax and abdomen.
- have a single pair of antennae on the head.
- have three pairs of legs originating from the thorax.
- often have wings and can fly.

### **Fish**

- lay eggs without shells in water.
- breathe with gills.
- are covered with scales or smooth, leathery skin.
- have fins but no legs or toes.
- are cold-blooded.

**Arachnid**

- 8 legs
- No antennae or wings
- Two body parts
- Exoskeleton

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**TO THINK ABOUT**

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What class of animals do each of these belong to?

Laysan albatross – bird

Puma – mammal

Johnson jumping spider – arachnid

American bullfrog - amphibian

Explain why each animal belongs to that class. Repeat the activity with other animals as desired.

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# NARRATIVE NONFICTION

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The animal biography series are all narrative nonfiction. They tell a story (narrative) about a real animal (nonfiction).

## **Narrative Writing**

Beginning, middle, end. For each story, I had to focus by concentrating on the animal. We had decided that this was the animal's story, so everything had to center around the animal itself. I needed details of the animal's life, environment, and challenges it faced.

## **Research**

Each animal needed a timeline. For Wisdom, I researched natural disasters in the Pacific Ocean and noticed the hurricanes, tropical storms, and tsunamis. Each of these would impact the albatrosses in some way. Also, the plastic pollution in the Pacific would affect the birds.

For Abayomi, I used Google Earth to find the chicken house where the incident with the mother occurred. It was interesting to use the program to virtually drive around the area. There are many commercial greenhouses that are readily visible. The most striking thing was photos posted close to the chicken house, which showed skyscrapers. It reinforced the idea that these pumas were living in an urban area.

Nefertiti involved an intensive afternoon of talking directly with the lead scientist, Stephanie Countryman. Read more about the interview here:

<http://mimshouse.com/nefertiti-spidernaut/>

One particular thrill was a conversation with astronaut, Sunita Williams.

Rosie the Ribeter jumped in the Calaveras County Frog Jumping contest over 30 years ago. The challenge was to find the frog jockeys who jumped her. Unfortunately, the lead jockey, Lee Guidici, had passed away. But I found his widow, and the other frog jockeys. Each interview added information about the contest and the frog.

Once I knew timelines and had details, the writing started. Each story went through multiple drafts before I was satisfied with it. Then, copyeditors read and made comments.

**To Discuss:** The focus of these stories is the animal itself. Choose one story and think about how you might tell the story from the point of view of a person involved. How does this change the story? Is it better or just different?

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# WISDOM, THE MIDWAY ALBATROSS

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## Possible NGSS Standards

**K-LS1** Plants and animals need food and water to survive.

**2-LS4.D** Biodiversity. There are many different kinds of living things in any area and they exist in different places on land and in water.

**3-LS1.B** Reproduction and life cycles

**3-LS3.B** Inheritance and environment create individual traits

**4-LS1.A** Plants and animals have internal and external structures that serve various functions in growth, survival, behavior and reproduction

**5-LS1.C** Food provides animals with materials for body repair, growth, energy to stay warm and for motion.

**5-LS2.A** Interdependent relationships in ecosystem. Food webs. Decomposers.  
Healthy ecosystems needs a variety of species. Invasive species can upset the balance of an ecosystem.

## Resources:

US Fish and Wildlife Service – Pacific Region Flickr Page

<https://www.flickr.com/photos/usfwspacific/albums/72157672595897355>

US Fish and Wildlife Service – Pacific Region Tumblr Blog:

<http://usfwspacific.tumblr.com/>

Wisdom's Facebook Fan Page:

<https://www.facebook.com/wisdomthealbatross>

National Oceanic and Atmospheric Administration Lesson Plans:

<http://oceanservice.noaa.gov/education/lessons/welcome.html>



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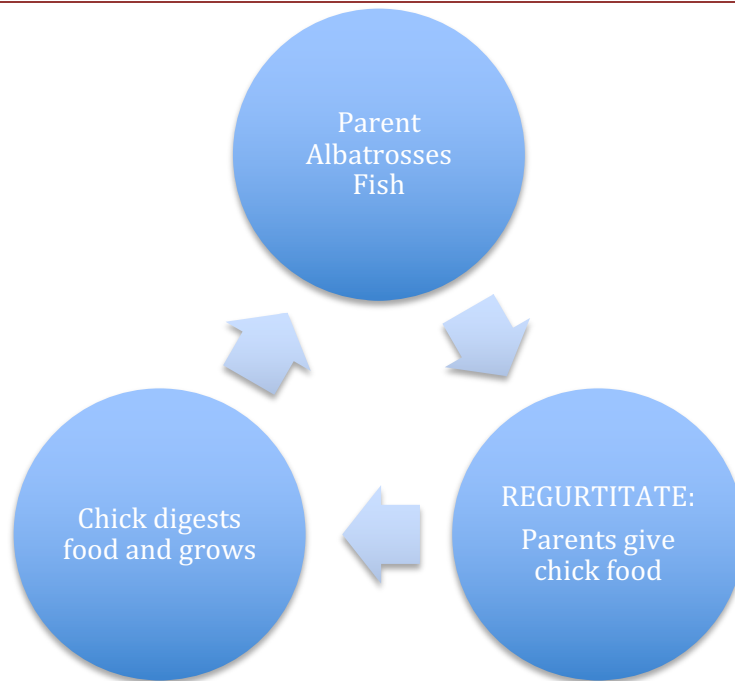
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eBook Distribution: Follett eBooks, Kindle, Nook, iBook, Kobo, EPIC! app

## LAYSAN ALBATROSS CHICKS FOOD WEB

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### WHAT YOU NEED TO KNOW

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1) **Carrying food.** Laysan albatrosses often fly 1000 miles in search of food. They fly to the North Pacific where they can catch the 1-1.5 foot long squid they prefer. How do albatrosses carry food back to their chicks? Wisdom, and other Laysan albatrosses depend on food from the ocean. They hunt for marine life, especially squid that are about 1-1.5 feet long.

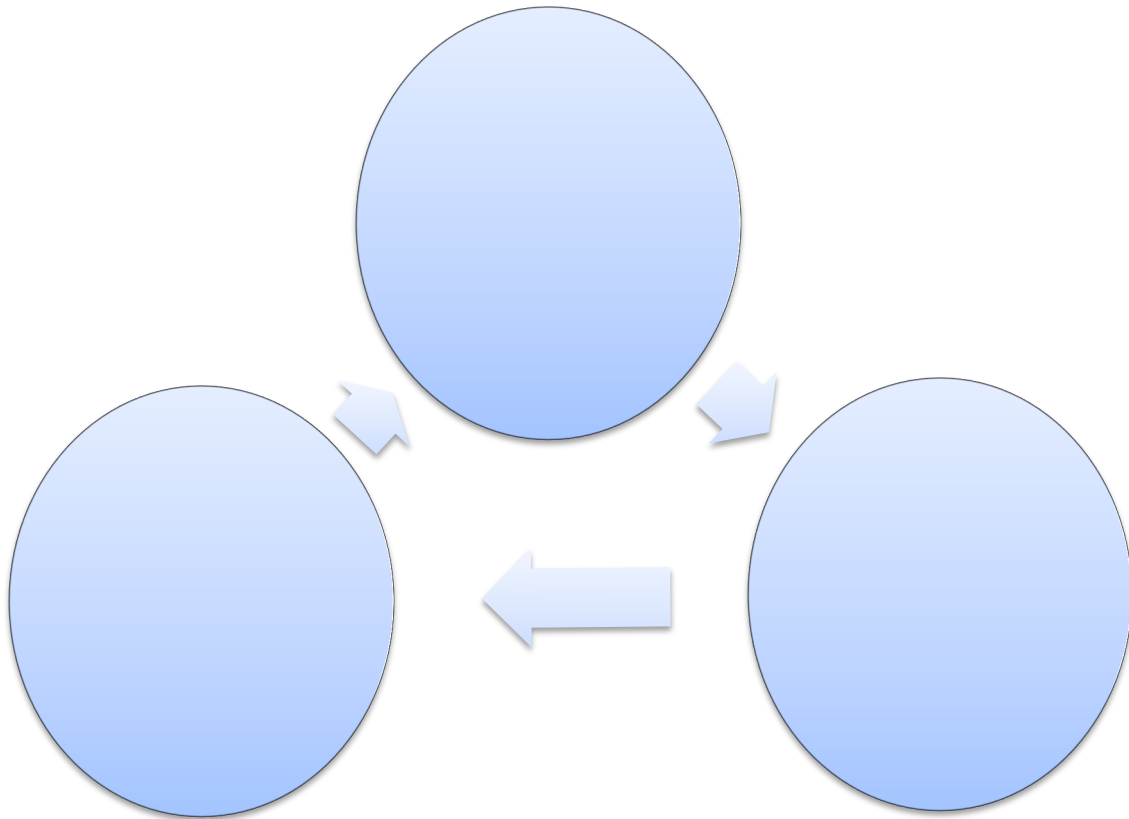
2) **Fake Food and Pollution.** But what happens if the parents unknowingly give the chick something other than food? Sometimes, the Laysan albatrosses think chunks of plastic are food. Think about how this would upset the chick's food web.

The problem is that chicks can't regurgitate yet. If the parent feeds it too much plastic, it's stomach fills up and there's no room for food. Often, the chick dies of starvation.

### LAYSAN ALBATROSS CHICK'S FOOD WEB

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Students: Fill in the circles with information about the chick's food web.



## ECOLOGY OF MIDWAY ISLAND – TROPICAL ISLAND

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Midway Atoll National Wildlife Refuge/Battle of Midway National Memorial within the Papāhānaumokuākea Marine National Monument.

Midway Island is given the Hawaiian place name of Pihemanu, meaning "loud din of birds"

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### WHAT YOU NEED TO KNOW

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**Life Cycle.** Discuss the life cycle of the Laysan albatross. They have an interesting mating dance that you can see on YouTube, for example: <https://www.youtube.com/watch?v=d1pJwOnYrs0> Apparently, they mate for life. They lay only one egg a year. If that egg doesn't hatch or is damaged, they'll have no babies that year.

Albatrosses are marine birds, which means they spend most of their life flying over the Pacific Ocean. How did scientists know the age of Wisdom? Discuss banding of birds.

If 90% of the population of Laysan albatrosses live on one tropical island, what would happen if the island was destroyed?

#### **Bird Counts Give Data**

Midway Island is the largest tropical bird rookery in the world, with about 90% of Laysan Albatrosses.

2015 count<sup>1</sup> 666,044 pairs of nesting Laysan albatrosses

28,610 pairs of black-footed albatrosses

See photos, charts and more of the 2015 bird count here:

<https://www.flickr.com/photos/usfwspacific/sets/72157649901861280/>

Scientists monitor the ecology by counting the birds every year. Think about how you could count birds that fly around all the time.

They count the birds sitting on a nest and multiply by 3. There's the bird on the nest, its mate flying around somewhere, and the chick. Young or immature birds not nesting aren't counted.

"In the 1920s, the entire Laysan albatross population in the Northwestern Hawaiian Islands, where most of them historically nest was estimated to be fewer than 20,000 birds owing to illegal egg poachers and feather hunters," noted Deputy Refuge Manager Bret Wolfe.

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<sup>1</sup> 2015 Bird count on Midway:

[https://www.fws.gov/uploadedFiles/Region\\_1/NWRS/Zone\\_1/Midway\\_Atoll/Documents/Hatch%20Year%202015%20NR\\_FINAL\(4\).pdf](https://www.fws.gov/uploadedFiles/Region_1/NWRS/Zone_1/Midway_Atoll/Documents/Hatch%20Year%202015%20NR_FINAL(4).pdf)



## CHART OF BIRD COUNT ON MIDWAY ISLAND IN 2015

Think about scientific data: Discuss the method of counting birds. Is it accurate? Does it give useful information?

Which year had the lowest population for each species? Was it the same?

Which year had the highest population for each species? Was it the same?

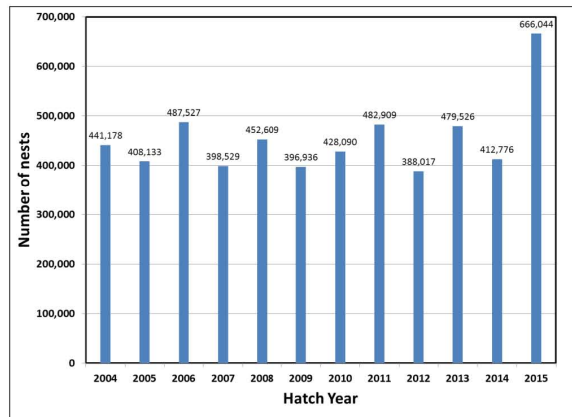


Figure 1. Annual number of Laysan albatross nests at Midway Atoll NWR (2004-2015).

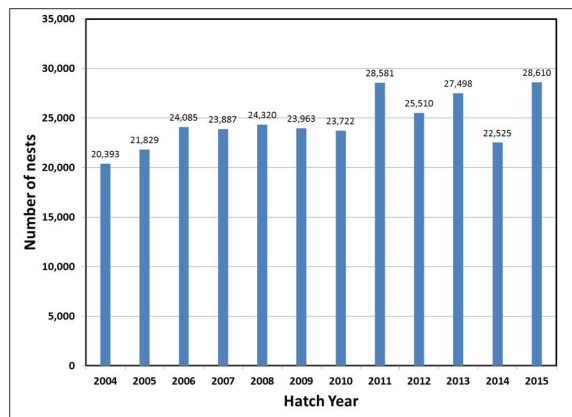


Figure 2. Annual number of Black-footed albatross nests at Midway Atoll NWR (2004-2015).

Image source: <https://www.flickr.com/photos/usfwspacific/16103405297/in/album-72157649901861280/>

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# ABAYOMI, THE BRAZILIAN PUMA

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## Possible NGSS Standards.

**K-LS1** Plants and animals need food and water to survive.

**1-LS1.A** Plants and animals have different parts that are used for different things including seeing, hearing, grasping objects, protection, transportation, eating, drinking, survival, and growth.

**1-LS1.B** Adult plants and animals have young. Parents sometimes help the young survive.

**1-LS3.A** Plants and animals inherit traits from parents.

**2-LS4.D** Biodiversity. There are many different kinds of living things in any area and they exist in different places on land and in water.

**3-LS1.B** Reproduction and life cycles

**3-LS2.C** Ecosystems dynamics, function, and resilience. An environmental change will favor some animals and hurt others.

**4-LS1.D** Plants and animals have receptors for information that the animal uses to perceive its environment, and to guide its actions.

**5-LS2.A** Interdependent relationships in ecosystem. Food webs. Decomposers. Healthy ecosystems needs a variety of species. Invasive species can upset the balance of an ecosystem.

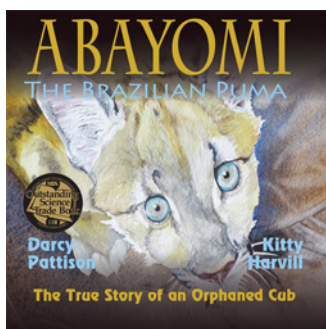
## Resources

Conservation Corridor: <http://conservationcorridor.org/>

Florida Wildlife Corridor: <http://floridawildlifecorridor.org/>

Abayomi project: <http://english.unica.com.br/abayomi-project/>

Video of Pumas: [https://youtu.be/zNkoJ\\_0i5Ik](https://youtu.be/zNkoJ_0i5Ik)



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Audiobook distribution: Findaway, Follett School Solutions, Mackin, EPIC! app

2015 National Science Teacher's Association Outstanding Science Trade Book

## LIFE CYCLE OF A PUMA

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Pumas are mammals, which means they have a live birth and they feed milk to their young. A young puma lives with its mother for about a year until it's learned enough to survive on its own.

**1-LS1.B** Adult plants and animals have young. Parents sometimes help the young survive.

Abayomi is a sad story when the mother puma dies.

What do mother pumas do to help their cubs survive and grow?

Food

Protection

What are some other things that parents can do to help a baby/child survive?

Food, shelter, transportation, wise advice, teaching

Think about these needs and characteristics of a mammal and explain how a mother puma and baby puma are similar? How are they different?

Fur

Food

Shelter

Companions

## CORRIDOR SCIENCE – MOVING AROUND THE ECOSYSTEM.

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Corridor science studies how animals move within an ecosystem. When it finds patterns of movement, it identifies possible areas for conservation.

**1-LS1.A** Plants and animals have different parts that are used for different things including seeing, hearing, grasping objects, protection, transportation, eating, drinking, survival, and growth

How does the method of transportation change how you develop corridors? For example, what would be the difference in corridors for birds, bears, and elephants?

Many corridors are designed for a lead species such as a puma. However, when the corridor is set aside, many other species will benefit.

Think about how diversity works in a corridor area. How could it help some species and hurt others?

**2-LS4.D** Biodiversity. There are many different kinds of living things in any area and they exist in different places on land and in water.

**3-LS2.C** Ecosystems dynamics, function, and resilience. An environmental change will favor some animals and hurt others.

What happens when a wildlife corridor is placed in the wrong place?

Corridor science says to build corridors along paths or trails where animals are already moving. Look at your school's campus. Are there places where the grass is worn down because people walk on it. Look at the connecting points across the grass. Can you explain why people walk this trail instead of using a sidewalk?

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## OPINION ESSAY RESEARCH

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Read articles about bears and wildlife corridors:

Krehbiel, Robb. Bears on the Move. February 2, 2016

<http://www.vitalground.org/bears-on-the-move/#.WCtoL9z72gQ>

Starr, Steven. Turkey's bear boulevard: how a wildlife corridor may save their hides. December 17, 2015.

<http://www.thenational.ae/arts-life/the-review/turkeys-bear-boulevard-how-a-wildlife-corridor-may-save-their-hides>

Discuss the problems with setting up a wildlife corridor. Write an opinion essay about whether or not you would recommend wildlife corridors to help an endangered species.

## ECOSYSTEMS AND INTERDEPENDENT RELATIONSHIPS

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- 2-LS2.A** Interdependent relations in an ecosystem. Plants need water and light to grow. Plants depend on animals for pollination and to move their seeds around.
- 2-LS4.D** Biodiversity. There are many different kinds of living things in any area and they exist in different places on land and in water.
- 3-LS2.C** Ecosystems dynamics, function, and resilience. An environmental change will favor some animals and hurt others.
- 5-LS2.A** Interdependent relationships in ecosystem. Food webs. Decomposers. Healthy ecosystems needs a variety of species. Invasive species can upset the balance of an ecosystem.

### THE PUMA-CAPYBARAS-TICKS-BRAZILIAN SPOTTED FEVER CONNECTION.

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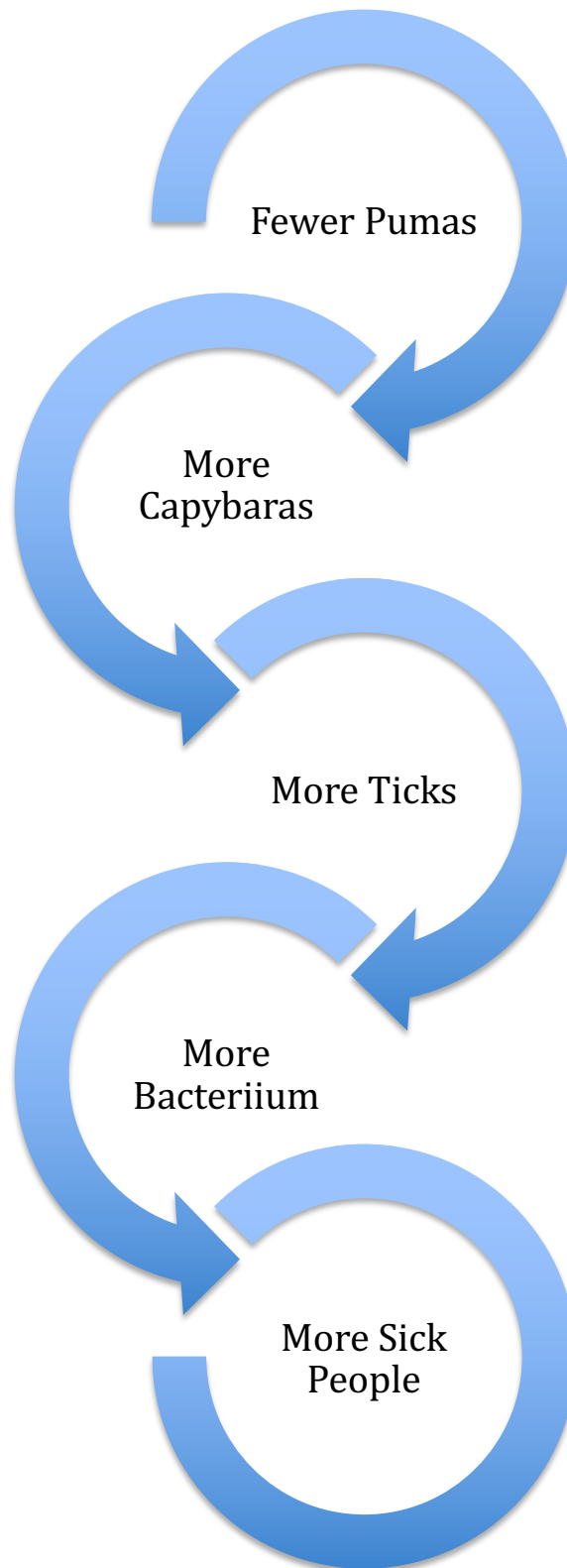
Since 2000, there's been a reemergence of the Brazilian spotted fever, mostly in Brazil. The disease is carried by ticks. The most common host for ticks are the rodent, capybaras. One of the capybaras' predators is the puma.

Puma scientists argue that this chain of interdependent animals has resulted in the increase in Brazilian spotted fever. With fewer puma, there are more capybaras, which leads to more ticks and more people sick with Brazilian spotted fever.

Draw a diagram to explain the relationship between pumas and Brazilian spotted fever.

## RELATIONSHIP BETWEEN PUMAS AND INCREASE IN BRAZILIAN SPOTTED FEVER.

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# NEFERTITI, THE SPIDernaut

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## Possible NGSS Standards:

**K-LS1** Plants and animals need food and water to survive.

**1-LS1.A** Plants and animals have different parts that are used for different things including seeing, hearing, grasping objects, protection, transportation, eating, drinking, survival, and growth.

**1-LS3.A** Plants and animals inherit traits from parents

**3-LS1.B** Reproduction and life cycles.

**3-LS3.B** Inheritance and environment create individual traits.

**3-LS2.C** Ecosystems dynamics, function, and resilience. An environmental change will favor some animals and hurt others.

**3-LS4.C** Adaptation

**4-LS1.A** Plants and animals have internal and external structures that serve various functions in growth, survival, behavior and reproduction.

**5-LS2.A** Interdependent relationships in ecosystem. Food webs. Decomposers. Healthy ecosystems needs a variety of species. Invasive species can upset the balance of an ecosystem.

This story is also an example of setting up a scientific experiment and carrying it out. It models many practices and cross-cutting ideas.

## Resources:

1) **Spot the Station App.** Check out this app which tells you when the International Space Station is overhead. <http://mimshouse.com/spot-space-station/>

2) **Scientist Interview.** Read about interviewing Stephanie Countryman, the lead scientist for this experiment: <http://mimshouse.com/nefertiti-spideronaut/>



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2016-17 Alabama Camellia Children's Choice Award reading list, 4-6<sup>th</sup> grade Nonfiction

Featured in Picture-Perfect STEM Lessons, Grades 3-5 by Karen Ansberry and Emily Morgan

## FOOD AND WATER IN SPACE

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How would an animal get food and water in space? That's the basic question for this amazing science experiment. They needed to know the life cycle and food/water needs of the Johnson jumping spider and fruit flies.

**The mission:** 100 days in space

**The problem:** Johnson jumping spiders are limited by water. They can live without food for a long time, but they must have water. Johnson jumping spiders need to catch live prey to eat. They could not go 100 days without food, but the scientists didn't know how long exactly they could go without food.

### ANIMALS NEED FOOD AND WATER

**Water** for the spider and fruit flies was easy. The scientists just put a small container of water in the spider's habitat.

**Food for spiders.** Most spiders are passive hunters. They build a web and wait for it to catch food for them. However, jumping spiders are active hunters. They jump to catch their prey. But in the microgravity of space, when they jump, they will float around. How could they catch a fruit fly if they can't jump?

**Food for fruit flies.** Fruit flies will eat fruit fly flakes, a commercial food for fruit flies made especially for scientific experiments.

**Life cycle for spiders.** Johnson jumping spiders live for about a year. The spider should live long enough to go up to the space station and then return back to Earth.

**Life cycle for fruit flies.** Fruit flies only live for 40 days.

### THE PROBLEM

The spiders will eat fruit flies. But fruit flies only live for 40 days. How could scientists stretch out the food supply for 100 days? Or at least longer than 40 days?

Brainstorm ideas on how to keep the spider alive in space for 100 days.

### THE SCIENTIST'S SOLUTION

The scientists decided to try to raise several generations of fruit flies. They created four chambers in the spider's habitat. The first chamber held enough water for the spider to live 100 days. The second chamber contained fruit fly food and larvae. They timed the fruit fly's life cycle, so that they hatched just about the time the habitat reached the International Space Station. Flies would be alive for the spider to try to catch and eat.

The third and fourth chambers contained more fruit fly food. The astronaut was told to open these chambers at certain intervals. Scientists hoped the flies would find the food and lay eggs in these chambers, which would give a second and hopefully a third generation of fruit flies. If it worked, the spider would have flies for 100 days.

The solution was successful. The spider had food for about 60 days, which was enough. She arrived back on earth alive and started eating again.



### ADAPTATION, INHERITANCE AND ENVIRONMENT

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On Earth, Nefertiti, like all Johnson jumping spiders, jumped in an arc to catch its prey. On the International Space Station, she lunged for the fruit flies. She changed the arc of her jump.

Fill in the blanks.

Nefertiti's inheritance: She knew how to \_\_\_\_\_

Nefertiti learned from her environment: She learned how to \_\_\_\_\_

Nefertiti adapted to her environment: She changed how she \_\_\_\_\_

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# ROSIE THE RIBETER

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## Possible NGSS Standards:

**-LS1** Plants and animals need food and water to survive.

**1-LS1.A** Plants and animals have different parts that are used for different things including seeing, hearing, grasping objects, protection, transportation, eating, drinking, survival, and growth.

**1-LS3.A** Plants and animals inherit traits from parents

**3-LS1.B** Reproduction and life cycles.

**3-LS3.B** Inheritance and environment create individual traits.

**3-LS2.C** Ecosystems dynamics, function, and resilience. An environmental change will favor some animals and hurt others.

**3-LS4.C** Adaptation

**4-LS1.A** Plants and animals have internal and external structures that serve various functions in growth, survival, behavior and reproduction.

**5-LS2.A** Interdependent relationships in ecosystem. Food webs. Decomposers. Healthy ecosystems needs a variety of species. Invasive species can upset the balance of an ecosystem.

## Resources:

Read Mark Twain's original short story, "The Celebrated Jumping Frog of Calaveras County"



### ***Rosie the Ribeter: The Celebrated Jumping Frog of Calaveras County***

#### ***Another Extraordinary Animal Collection***

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### ***History of the Jumping Frog Jubilee™***

Mark Twain's first successful short story was "The Celebrated Jumping Frog of Calaveras County," published in 1865. The humorous story was based on a story he heard in Angels Hotel in Angels Camp, California, where he'd spent time as a miner. Calaveras County, California drew on this legend & added the Jumping Frog Jubilee™ to its 1928 county fair.

## INTERVIEW WITH BILL GUZULES ABOUT TEACHING KIDS ABOUT BULLFROGS

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LEE GUIDICE, BILL GUZULES AND DENNY MATASCI were Rosie's frog jockeys. Here, Bill Guzules talks about bullfrogs and kids.

### **How did you and Lee Guidici get the idea to teach kids about bullfrogs? Why take them into the schools?**

We started teaching kids back when they did outdoor education program in the unified school district. The kids didn't know the difference in frog and toad. We hit on a way to do that, because of the Frog Jump. They make a big deal to be sure the kids brought frogs, not toads. At first, we had to talk about the differences. Most kids brought toads instead of frogs. The Frog Jump evolved from that early outdoor education program. Today, kids can easily list 5 differences between frogs and toads.

FROG	TOAD
Long legs, made for hopping	Shorter legs, made for crawling
Smooth skin covered with mucus	Rough, thick skin
Eggs in a cluster	Eggs in a chain
Lives in water	Lives on land
Round, bulging eyes	Football shaped eyes, not bulging

We started the Frog Jump in 1966, so we've had 53 years of jumping frogs at Sutter Elementary School. In fact, we've had a big impact on the school. Originally, their mascot was a serpent, but that's changed to a frog.

Our Frog Jump at the school is a sanctioned preliminary jumping contest because we jump 300-400 frogs. The winner of our jump goes to the Frog Jubilee ® straight into the final division. They skip the preliminaries. We currently have an alumni division, too, and the alumni winner also goes into the final.

### **What do kids like most about bullfrogs?**

Kids and frogs go together. At Sutter Elementary, sometimes kindergarteners are intimidated by the bullfrogs. They are BIG – as long as 14 inches, from nose to stretched out legs, or 8" nose to tail. The fifth graders help the kindergarteners learn about the frogs. Each 5<sup>th</sup> grader works with 4-5 kindergarten kids. As they grow up, kids look forward to becoming the "big" kids who help out with the frog jump and teaching the younger kids about frogs.

The frog jump lives in the memory of these kids, too. When kids come back, they ask if they still do the frog jump. We've also started holding Frog Jump times for junior high kids later in the day, after their school lets out.

We haven't had any kids that I know of become herpetologists. But lots have gone on to teach science. In fact, a couple former students currently teach in same district they graduated from.

### **What do kids like least about bullfrogs?**

When you hold a bullfrog for a while, it dries out. They pee to wet themselves. This helps their skin stay moist, but it also makes them slippery and likely to escape. The frogs pee all over your hands and sometimes it gets on your clothes. That's about the only thing kids don't like about

the frogs. We always have sanitary wipes available, and we remind them to wash hands before lunch.

**What's the most surprising thing about bullfrogs for kids?**

Kids are always surprised about how their attitude to the frogs develops. Over the years of frog jumps, they gain so much knowledge about frogs and learn to love them. They start out not touching frogs but end up loving them. They learn how to handle frogs without hurting them. They move from fear to confidence. It's fun to see kids attend the Frog Jubilee in Angels Camp.