Science Communication

UC Davis
Animal Behavior Graduate Group
The Ethogram

UCDAVIS GEAR UP
A Program of the School of Education

CENTER FOR COMMUNITY AND CITIZEN SCIENCE

Teacher Notes

Grade level(s): 5–8

Time: ~45 min

Materials:

- Interactive google slides (share a view-only copy with students so they can access the links)
- Students need computers to start researching their Creature Feature pieces

Preparation:

- You may want to have students explore The Ethogram website before coming to class. Assign students to choose one Creature Feature to read as homework (students will share what they learned in a think-pair-share during this lesson)

Teacher Notes

CONTEXT:

This lesson is designed to engage students in researching and writing about an animal species of their choice (in the style of a Creature Feature blog). The lesson links back to lesson 1 by asking students to include an answer to one question about behavior in their written piece.

If they would like, students can submit their Creature Features for publication on The Ethogram website! We hope to encourage students' creativity and enthusiasm by providing an opportunity for their work to be published.

Teacher Notes

RATIONALE:

Written communication is vital to science as in many other fields. This lesson is centered on the idea that communication takes many forms—both in humans and non-human animals.

In this lesson, students choose an animal they are interested in learning more about and work independently or in groups to write about it. They will continue to apply the NGSS practice of *Asking questions*, which they will answer through research using reliable online sources. This lesson especially focuses on the NGSS practice of *Obtaining, evaluating, and communicating information*.

Teacher Notes

INSTRUCTIONS:

See the lesson plan and Student Creature Feature Guidelines for an outline of the lesson and detailed instructions.

Decide how you would like to structure the assignment (e.g., will students each write their own piece, or will they work in pairs/groups?) and what reference format you would like students to use.

Share the Student Creature Feature Guidelines with your students after you introduce the assignment. Feel free to make a copy and modify the guidelines for your class.

Animals communicate in many different ways

Sounds,
Building structures,
Chemicals,
Visual displays,
Body movements,
Body positions/postures

People communicate in many different ways too!

In lesson 2 you learned about *ethograms*, which are tools for collecting data about animals' behavior . . .

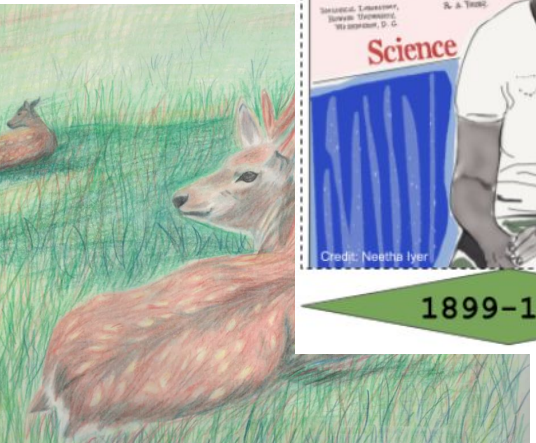
The Ethogram is also the name of a website communicating about animal behavior and the scientists who study it.

People communicate in many different ways too!

Statement of purpose: *The Ethogram encourages interaction between scientists and non-scientists in order to* ***spark curiosity and passion for the study of animal behavior*** *and general scientific research. Our mission is to create a platform that allows scientists to disseminate their research in approachable and exciting ways. In doing so, we also aim to* ***train the next generation of science communicators****. Using* ***diverse narratives of animals and those who study them****, we provide accessible scientific information through a* ***variety of media types, from text to sketch to video****.*

Know your style

Visual



Both!

THE ETHOGRAM
OFFICIAL BLOG OF UC DAVIS ANIMAL BEHAVIOR GRADUATE GROUP

Young Explorers
Sci Hero Trading Cards

Zoology | Marine Biology

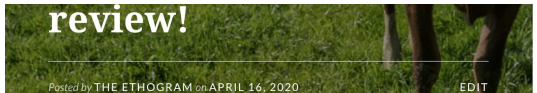
1899-1964

Dr. Roger Arliner Young

Roger Arliner Young planned to study music, but after taking a zoology class in college, she changed course and graduated with a biology degree. During her science career, she was the first Black woman to publish her own research in zoology & marine biology! She faced many challenges throughout her life but never gave up on being a scientist!

Super Powers

★ 1st Black woman to get a PhD in 1940
★ Social justice activist
★ Single-cell animal & Sea urchin expert



Written

Katherine Johnson was born in 1918 in West Virginia, where the state was still deeply engrained in Southern Democratic Politics; nued in many institutions, and discrimination : Black Americans. Although there were iges and barriers presented to Katherine as a an in post-Civil War America, her brilliance and rough all of the potential hardships. She learned th that not only did she love math, but she was d at it. As she began counting everything from lates washed, her parents quickly learned that is no ordinary child.

n would find ways to incorporate math into her it quickly burgeoned into her passion. Johnson in her education that she was ready to attend young age of 10, after being encouraged by her few grades. However, her hometown in White NV did not offer public schooling for Black 8th grade. Her family, supportive of their

vis researchers have recently published an review about strategies used to optimize grazing ttle on rangeland. Authors of this review ids of animal behavior (Maggie Creamer and), agricultural economics (Tina Saitone), and plant oche).

ion refers to how cattle are dispersed when nsive and complex swaths of grazeable lands Rangeland accounts for greater than 50% of land ern United States, and depending on specific gelands cover approximately 80% of earth [1]. n grazing distribution on these landscapes is an nge faced by ranchers who manage cattle grazing on rangeland. Grazing patterns can impact various ecosystem services, water quality, wildfire spread, vegetation and animal health, environmental sustainability, and ranch profitability. Thus, achieving optimal grazing distribution is a timely and relevant

Know your content, know your audience

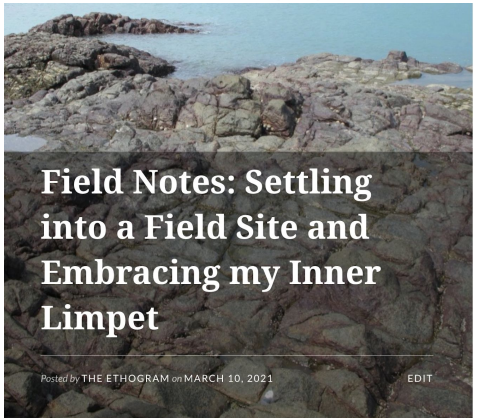
Ask a Scientist: The Elephant Spa

Posted by THE ETHOGRAM on OCTOBER 8, 2020 EDIT

Momo Meerkat writes, "Why do elephants like mud?"

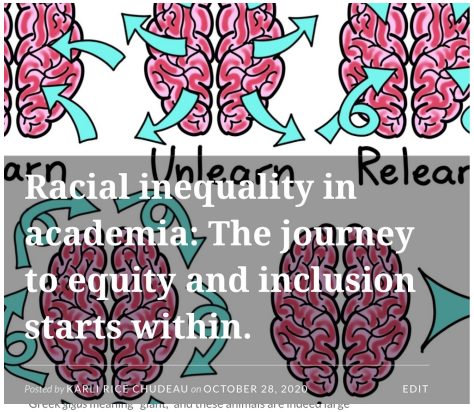
Good question, Momo Meerkat! I asked your question to my elephant scientist friend, Amanda. This is what she had to say: "Elephants use mud as a sort of sun block. Large, hairless animals like elephants use mud and dust to protect against sunburn and insect bites. Elephants do not sweat much, so any way they can keep their body cool in the hot air is helpful. That's also why many elephants enjoy the water!" Other animals–like rhinos and pigs–also follow this skin care routine, which is called mud wallowing. Keep searching for answers, Momo Meerkat!

– Nicole and Amanda, the elephant scientist



Field Notes: Settling into a Field Site and Embracing my Inner Limpet

Posted by THE ETHOGRAM on MARCH 10, 2021 EDIT



Racial inequality in academia: The journey to equity and inclusion starts within.

Posted by KARLYRICE CHUDEAU on OCTOBER 28, 2020 EDIT

Recent events have brought centuries of racial inequity in the US back into focus for many privileged, white communities and have left many of us flabbergasted and ashamed by our own contributions to this inequity. I am no exception. My educational, professional, and personal experiences have certainly shaped my career to what it is today; I am currently a conservation behaviorist, studying ways to improve conservation outcomes in pinnipeds (i.e. seals, sea lions, and walruses) and a science communicator, committed to instilling knowledge about and passion for the ocean to the public. However, I acknowledge I have built this career on privilege.

Metaphorically speaking, I imagine this privilege like building a house. From birth, I was provided with the foundation, four walls, and perhaps electric hook-ups. Throughout my education and work experience, I continued building my house by seeking out professional opportunities, learning specialized skills, and creating a network of supportive people. There were stalls and struggles, yet I was able to continue advancing my "home" due to my

Greek gigas meaning "giant," and these animals are indeed large among mollusks. Excitement at the prospect of potential discovery keeps me energized despite the hard physical work involved in this research.

Was I studying a rare, elevation-tolerant Himalayan mollusk here on Everest? Actually, I was standing 3 m above sea level at a tropical 8.9° N latitude, and I could hear waves of the Pacific Ocean lapping at the base of this "mountain" . . . I had not just climbed the indomitable 8,849 m Himalayan peak. Rather, "Everest" was our research team's nickname for one prominent granite hill at my study site on the Pacific coast of Panama. I was here to study the behavior and reproduction of a particular species of limpet, a large marine snail with a shell shaped like a pointy hat.

Younger — Older

Communication style depends on the subject matter (what is being communicated) and the target audience (who is receiving the message).

Purpose: factual, story-telling … or both!

Newsroom: Optimizing cattle grazing, a review!

Posted by THE ETHOGRAM on APRIL 16, 2020 EDIT

A team of UC Davis researchers have recently published an interdisciplinary review about strategies used to optimize grazi distribution of cattle on rangeland. Authors of this review represent the fields of animal behavior (Maggie Creamer and Kristina Horback), agricultural economics (Tina Saitone), and pl science (Leslie Roche).

Grazing distribution refers to how cattle are dispersed when foraging on expansive and complex swaths of grazeable lands called rangeland. Rangeland accounts for greater than 50% of l cover in the western United States, and depending on specific descriptions, rangelands cover approximately 80% of earth [1]. Achieving uniform grazing distribution on these landscapes is a enormous challenge faced by ranchers who manage cattle grazi on rangeland. Grazing patterns can impact various ecosystem services, water quality, wildfire spread, vegetation and animal health, environmental sustainability, and ranch profitability. Th achieving optimal grazing distribution is a timely and relevant

Field Fiasco: Fabric Fiesta!

Posted by MEREDITH LUTZ on OCTOBER 19, 2018 EDIT

Doing field research in a foreign country comes with many issues that you might not encounter in the United States—having to pack all of your equipment to meet airline regulations, adapting to a new culture, and speaking multiple new languages are all challenges I have had to overcome in order to study social relationships in lemurs in Madagascar over the past three years. One of the things that remains a constant battle, however, is converting between US customary units and the metric system. Let's be clear: I fully support using metric units and often find myself forgetting American conversions. How many ounces in a pound? Water boils at what degree Fahrenheit? Reacquainting myself with the metric system is always an adventure as I measure rain in millimeters, record the temperature 3 times daily in Celsius, try and decide how many kilograms of green beans to buy, and estimate the heights of trees in meters.

While my food estimating skills have improved in my now 4th field season in Madagascar, my fabric estimating skills apparently still are lacking. While my data collection protocols have remained

Factual

Creature Feature: Golden-crowned Sparrow

Posted by THE ETHOGRAM on MARCH 16, 2021 EDIT

Once upon a time, in a land far from people, a tiny egg cracked in its nest. Slowly, a small beak pushed through, delicately casting pieces of eggshell aside. It was followed by dark grey bulges that were closed eyes, and finally a floppy, mostly featherless and helpless body that weighed only 3 grams [1].

This hatchling was nestled warmly among a few siblings in a twig-shaped cup lined with grass and caribou hair in a small depression in the ground [1]. Although she didn't know it, her nest under a bush was in a vast wilderness in Alaska. What she did know was that she was hungry. What began as a feeble and silent head raise to open her mouth and beg for food, later became relentless begging accompanied by tiny peeping sounds. Both of her parents stuffed her and her siblings full of insects such as butterflies and stoneflies [1]. Summer days and nights passed with hardly any darkness and so much birdsong. Nearby she could hear the melancholy sound from her parents singing "Oh, dear me" in a dialect[a] that was unique to the region in which she was born [2].

Story-telling

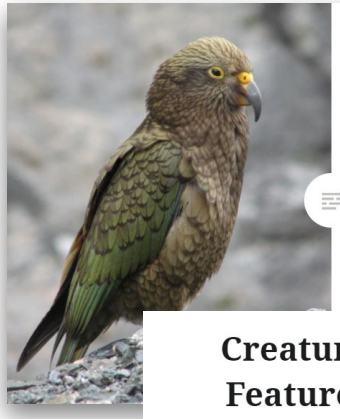
Reflection

- What is one thing you learned from the Creature Feature you read?
- What is one thing you liked about how the piece was written or presented?

Your turn:
Write your own Creature Feature!

- Describe your species and its behavior
  - 3–6 paragraphs (300–1000 words)
- Write an introduction and a conclusion
- Include at least one question about behavior
  - Think back to lesson one
- Be creative! You can include pictures/artwork

For more details:
[Student Creature Feature Guidelines]



Creature Feature: Kea

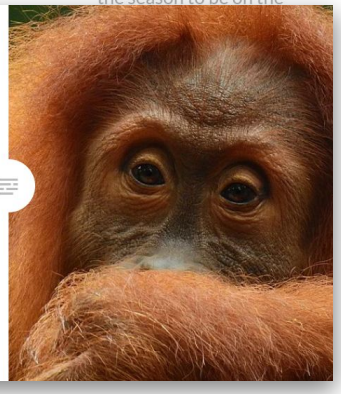
Many animals are afraid of humans, and with good reason. Then there is the kea (Nestor notabilis), a playful bird known for its intelligence, wild curiosity, and general

Creature Feature: Reindeer

With jack frost nipping at your nose and holiday spiced drinks at your local coffee shop, 'tis the season to be on the

Creature Feature: Orangutans

Learn about these clever red-headed apes from southeast Asia in this week's Creature Feature.



Make sure to include:

- The scientific name of the animal
  - (*Genus species, e.g. Canis lupis*)
- Where they live
- What type of animal
  - Is it a bird, mammal, reptile, fish…?
- Cool facts about your species

Don’t forget:

- Include and reference at least **2 trustworthy sources**
  - Examples: a zoo website, a museum website, research articles, or textbooks
  - Do not reference social media or Wikipedia (but you might find other trustworthy sources from these sites)
- Have fun!
  - Pick a species that you are excited and curious about

Format

Creature Feature: Name of species

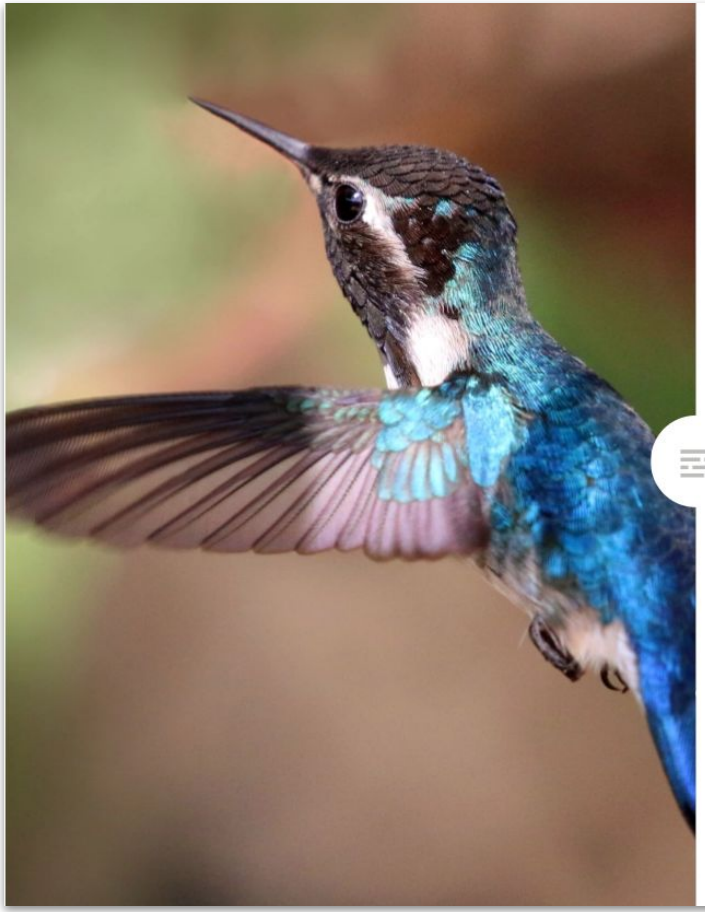
Your Written Creature Feature Paragraphs Go Here!

Images: Include images with captions here if you want to!

Written by: Author name/nickname + blurb

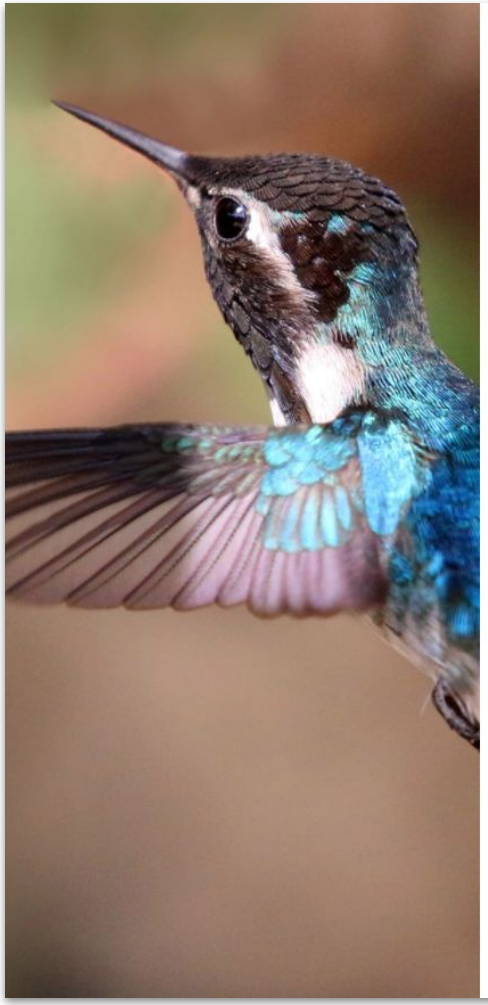
Reference List: The trustworthy sources you used

Here’s an example:



Creature Feature: Hummingbirds

Good things come in small packages! This saying perfectly describes our flying, flower-loving friends, the hummingbirds.



Creature Feature: Hummingbirds

Posted by THE ETHOGRAM *on* SEPTEMBER 1, 2020

"Good things come in small packages." This saying perfectly describes our flying, flower-loving friends, the hummingbirds. All hummingbirds belong to a family of birds called the Trochilidae family, which has 349 different species. Some of these species are the smallest birds in the world, with the tiniest being the Bee Hummingbird (*Mellisuga helenae*). The Bee Hummingbird is only 2.25 inches long (about as long as your pinkie), and it weighs less than 2 grams, or less than the weight of two paper clips [1]! The largest hummingbirds are Giant Hummingbirds (*Patagona gigas*), which are about 8 inches long and can weigh over 23 grams [2].

Catchy **introduction** to grab the reader's interest

Includes **common and scientific names** of the species

Answers a question: What is the **function** of male flight patterns and colorful feathers?

(Even though the question is not stated in the piece, the author started by asking this question and then researched the answer.)

Photos help the reader visualize what is written and make it more eye-catching

Watching these birds fly around is already quite the show, but what adds to the spectacle is their colorful plumage, or feathers. Hummingbirds come in a wide variety of bright colors, especially male hummingbirds. Males use their vibrant, flashy plumage and fancy flight patterns to attract females. If you'd like to see these birds in action and you live in North or South America (the only continents hummingbirds inhabit), you can attract them right to your backyard! Check out this link to learn what you can do to bring hummingbirds to your yard for a visit.

A variety of colorful male hummingbirds. Left photo of a Broad-billed Hummingbird by Nathan Rupert [Source]; middle photo shows a Ruby-throated Hummingbird [Source]; right photo shows a Costa's Hummingbird [Source].

trying to flap your arms up and down 80 times in a single second! So where do they get the energy to beat their hearts and wings so fast? Hummingbirds eat a LOT relative to their size. They eat about half their total body weight in food every day, which is 3.14 to 7.6 calories a day [3]. If humans tried to eat as much as hummingbirds, we'd be eating around 155,000 calories per day, which is 50 times the amount humans typically eat in a day [4]. What exactly are these hummingbirds chowing down on? Nectar, a sugary liquid produced by flowers, makes up 90% of a hummingbird's daily diet (lots of sugar to power their constant activity!) with the last 10% consisting of various insects for protein.

A hummingbird getting his daily fill of nectar [Source].

Includes **citations** for the sources of information included in the previous sentence

At the very end, there is a list of all the **references** that were cited in the piece

References:

1. BirdNote (podcast). "Get to Know the Bee Hummingbird, the World's Smallest Bird." *Audubon*, 14 May 2019. http://www.audubon.org/news/get-know-bee-hummingbird-worlds-smallest-bird
2. Heynen, I., Boesman, P. F. D., & Kirwan, G. M. (2020). Giant Hummingbird (*Patagona gigas*), version 1.0. In *Birds of the World* (J. del Hoyo, A. Elliott, J. Sargatal, D. A. Christie, and E. de Juana, editors). Cornell Lab of Ornithology, Ithaca, NY, USA. https://doi.org/10.2173/bow.giahum1.01
3. "Hummingbirds of Chamizal National Memorial."

Creature Feature brainstorming

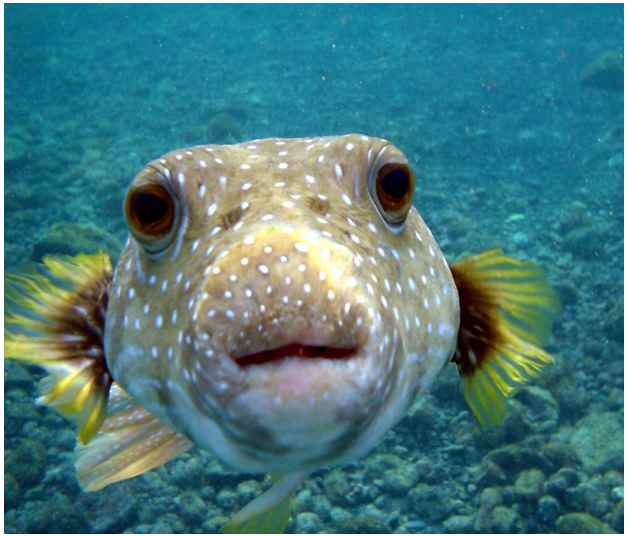


Photo Credit

Break into pairs or groups and brainstorm:

- Which **species** are you interested in writing about?
  - Check out the next two slides for some inspiration

- Jot down some **questions** you have about that animal
  - You can read about them or watch some videos to get ideas

- Search for information about your species: **find at least one trustworthy source**
  - Try searching on Google scholar to find scientific sources
  - The full assignment instructions (link below) has a list of possible sources to check out

For more details:
Student Creature Feature Instructions

Need inspiration? Here are some animals you could write about!

Fossa (*Cryptoprocta ferox*)
Photo credit: Nathan Rupert

Horned Desert Viper
(*Cerastes cerastes*)
Photo credit

Green Tiger Beetle
(*Cicindela campestris*)
Photo credit: Rob Mills

Peacock Mantis Shrimp
(*Odontodactylus scyllarus*)
Photo credit: Charlene Mcbride

Check out these lists for more animal ideas:

Mammals of the St. Louis Zoo

American Bird Conservancy's Top Ten Birds of 2021

Smithsonian Magazine's Most Interesting Insects

Monterey Bay Aquarium's Animals A to Z

National Geographic's Reptile Pictures and Facts

Wrap-up

In previous lessons you practiced:

- Asking different types of questions about animal behavior
- Gathering data about behavior by making an ethogram

Today we discussed:

- All animals communicate in a variety of ways!
- Science can be communicated in many different ways too.

Now, it's your turn to be the scientist and teach others about an animal of your choice with your Creature Feature. Follow your curiosity and be creative!