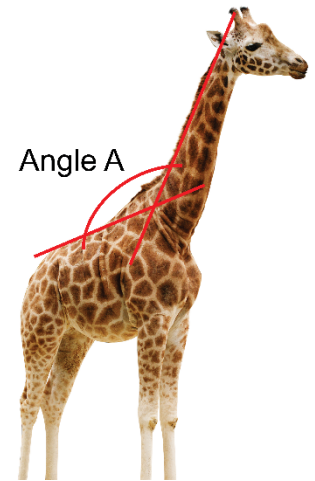


Getting to Know Giraffes

Diane and Hal Brierley Giraffe Ridge

Movement

1. Observe a stationary giraffe. Estimate the measurement of the angle made by its neck and its back. This is called the neck-back angle. Refer to the picture for guidance on finding the neck-back angle. Angle A refers to the giraffe's neck-back angle. Tip: First identify if the angle is acute, right or obtuse?
2. Observe a giraffe that is walking. Estimate the neck-back angle with each stride that it takes. Now, keep observing and decide if this angle is staying the same, increasing or decreasing with each step. Discuss with a friend and make a note of what you think.
3. If you can, compare your estimates with a different giraffe that you can observe walking.



A few scientists noticed that the angle between a giraffe's neck and its back changed as it walked or ran. In fact, they noticed that the angular change was a predictable pattern. Scientists search for patterns in nature in order to predict and understand all sorts of observations. A diagram from this study is on the next page.

4. This diagram is from an observational study of giraffes. The labels A-F represent different moments in the giraffe's movement. How did your estimates compare with what these researchers found?
5. Predict how the giraffe's geometry (neck-back angles) will shift when it gallops.

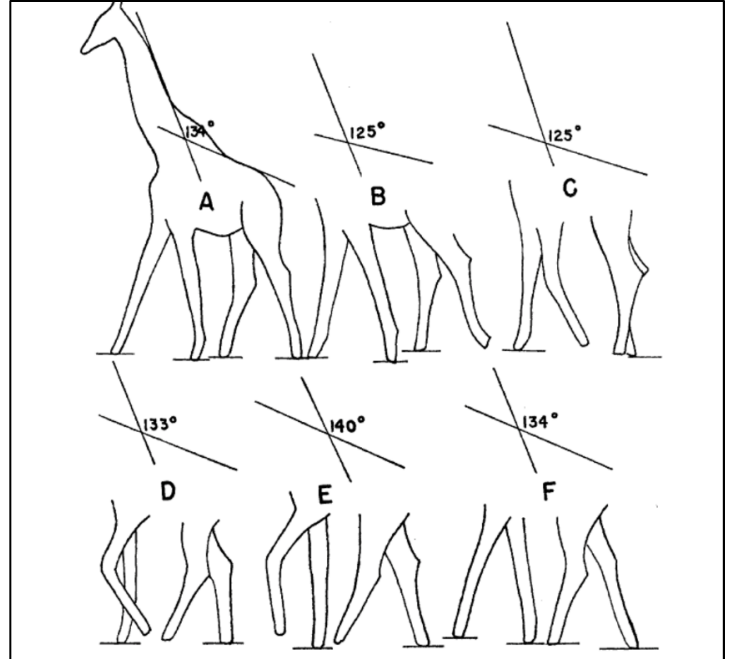


Figure SEQ Figure * ARABIC \r 1 1: From: Dagg, A. (1962). *The Role of the Neck in the Movements of the Giraffe*. *Journal of Mammalogy*, 43(1), 88-97. doi:10.2307/1376883

Eating

Observe some giraffes eating. Look carefully at the tongue.

1. What color is it? Consider how they use their tongues (it's quite different from us!). You can even feed the giraffes some lettuce, one of their favorite treats.
2. An adaptation is a learned behavior or an inherited trait that helps an animal survive in its surroundings. How is the giraffe's tongue an adaptation?
3. Estimate how many times longer the giraffe tongue is than your tongue.
4. Do you think taller giraffes have longer tongues? What kind of data would you want to collect to help you draw a conclusion?

You may notice the giraffes chewing and re-chewing their food. This is called ruminating. When you observe a giraffe ruminating, you may see its abdomen swell and the giraffe burp. This is completely normal and is the method the giraffe uses to digest the vegetation it eats.

5. What are some other animals that ruminate?
6. What is the rate of rumination and does it vary? Design a method that would allow you to estimate this rate. Does rumination allow for more nutrient absorption or less? Here is a short video in case you cannot observe the giraffes eating.
<https://www.youtube.com/watch?v=grvwgwJxnxo>



7. Notice the various items that are situated around the giraffe habitat at giraffe height. These structures provide enrichment (mental and physical stimulation) as the giraffes use their prehensile tongues to grasp the food within. Look around. Sketch or list the other items you observe in the giraffe yard. You can include these in the chart accompanying the Giants of the Savanna map.
8. Design an additional structure to provide enrichment for the giraffes. Be sure to take into consideration what you have observed about how giraffes live, eat, and move. For example, a ground level feeding enrichment may not be suitable for giraffes.

Spots

A unique giraffe characteristic is its spots. Did you know that a giraffe's spot pattern is similar to human fingerprints in that no two giraffe patterns are alike?

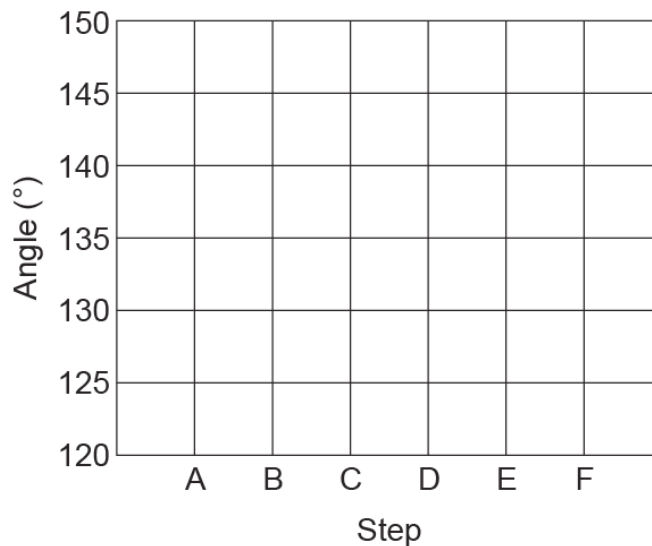
1. What function do you think the giraffe spots serve?
2. Find a giraffe and sketch the spot pattern you observe.

Take it Home

Movement

1. Use the data from Figure 1 to sketch on the coordinate axis how the neck-back angle changes as the giraffe walks through steps A-F.

Giraffe Neck-Back Angle While Walking



2. What kind of curve is this? What other examples of similar, real-world curves can you think of?

Silent Extinction

Read the following passage.

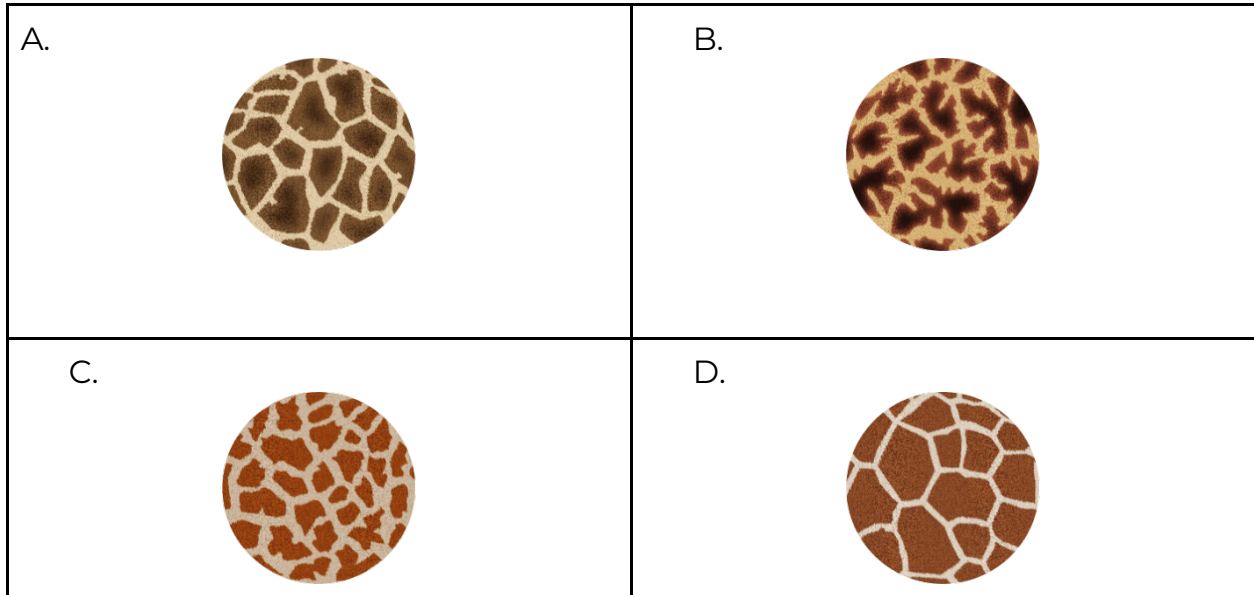
Until now the consensus has been that there's just one giraffe species, with nine subspecies. But the authors of a new study claim they've uncovered clear genetic differences among four populations of the long-necked herbivore: the northern giraffe, southern giraffe, reticulated giraffe, and Masai giraffe. These are now classified as 4 separate species. The chart below shows populations.

Common Name	Species Name	Population
Southern giraffe	<i>Giraffa giraffa</i>	52,050
Northern giraffe	<i>Giraffa camelopardalis</i>	5,195
Reticulated giraffe	<i>Giraffa reticulata</i>	8,700
Masai giraffe	<i>Giraffa tippelskirchi</i>	32,500

Table 1: Source: <https://giraffeconservation.org/giraffe-species/>

Giraffe spots can be used to tell the difference between giraffe types. Scientists have long thought of giraffes as one species with many sub-species. But recent DNA analysis indicates that giraffes should be reclassified as four distinct giraffe species. Photos of the spots of the four new species are below. Read the descriptions of the coat of the 4 species and write the letter of the pattern that you think is the best match with each of the written descriptions, 1-4.

1. ____ Masai Giraffes have the darkest spots. These spots have jagged, irregular edges resembling vine leaves.
2. ____ Northern Giraffes have the widest borders around their spots.
3. ____ Reticulated Giraffes have spots with fuzzy edges. The borders around the spots of this giraffe are the thinnest.
4. ____ Southern Giraffes may have spots with notches in them.



“I am absolutely amazed that no one has a clue,” stated Julian Fennessy, executive director of Giraffe Conservation Foundation. “This silent extinction. Some populations less than 400. That is more endangered than any gorilla, or almost any large mammal in the world.”

Giraffes have undergone a 40% decline in numbers over the past thirty years, leading to a change in the classification of their global conservation status from “Least concern” to “Vulnerable” (International Union for the Conservation of Nature Red Data List). That means the animal faces extinction in the wild in the medium-term future if nothing is done to minimize the threats to its life or habitat.

5. How do you think splitting giraffes into 4 species affects conservation efforts?