

# CHEETAH

ACCELERATION



## THE SERENGETI

This fact file compliments  
Lesson 4 in the Serengeti  
Science Expedition.

fact file

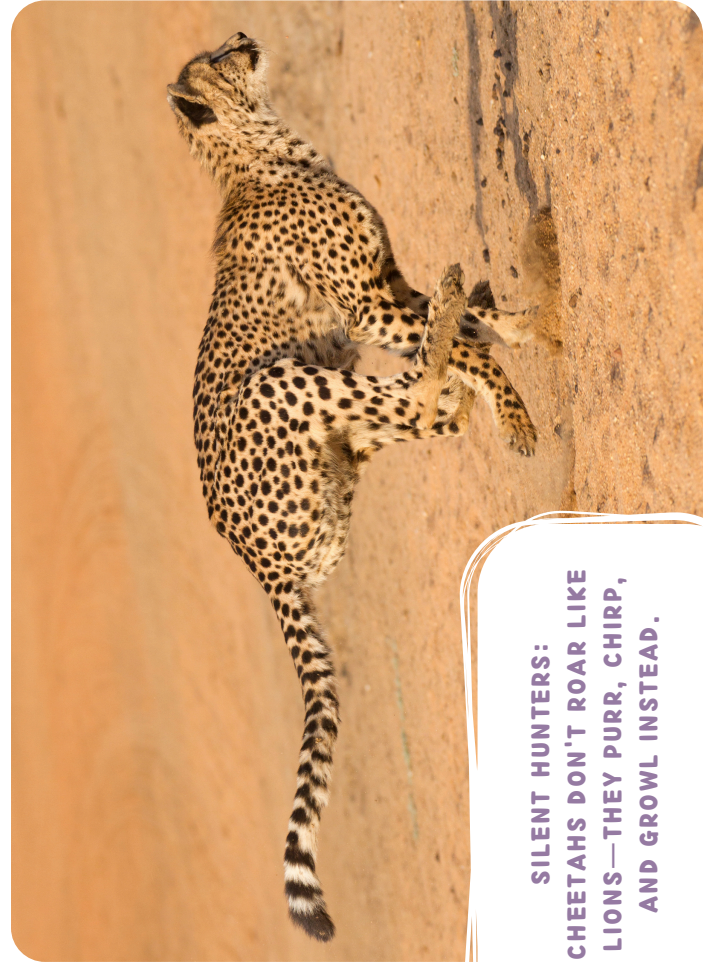


WHY DID THE  
CHETAH GET  
DISQUALIFIED FROM  
THE RACE?

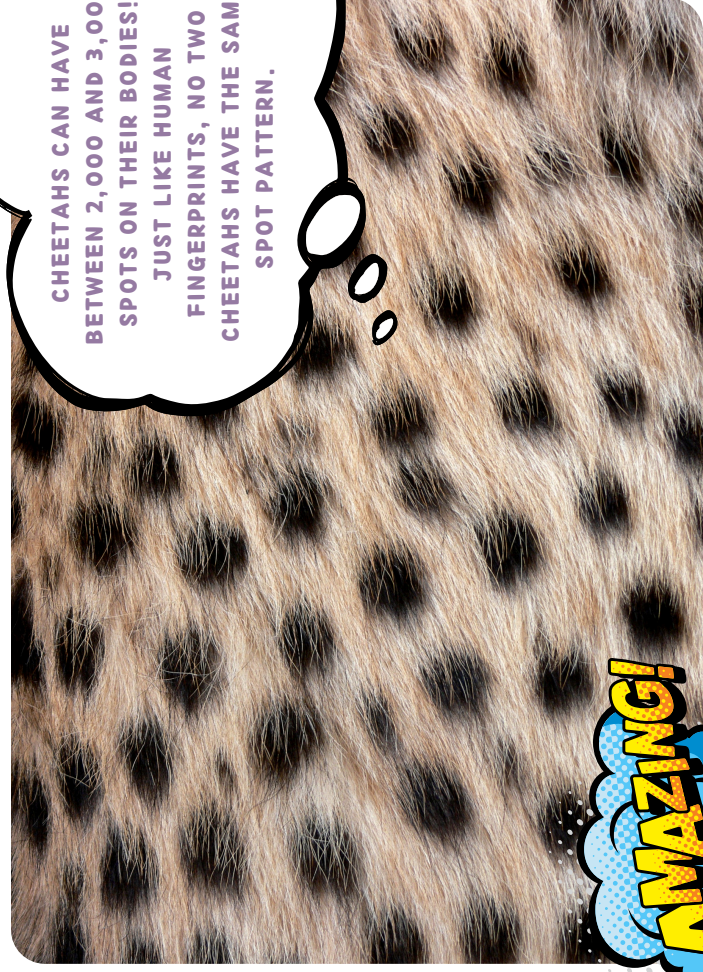
- They said he was a cheat-ah!



TEAR MARKS: THE BLACK LINES  
DOWN THEIR FACES HELP REDUCE  
GLARE FROM THE SUN, ALLOWING  
THEM TO SPOT PREY MORE  
EFFECTIVELY DURING THE DAY.



SILENT HUNTERS:  
CHEETAHS DON'T ROAR LIKE  
LIONS—THEY PURR, CHIRP,  
AND GROWL INSTEAD.



CHEETAHS CAN HAVE  
BETWEEN 2,000 AND 3,000  
SPOTS ON THEIR BODIES!  
JUST LIKE HUMAN  
FINGERPRINTS, NO TWO  
CHEETAHS HAVE THE SAME  
SPOT PATTERN.

AMAZING!

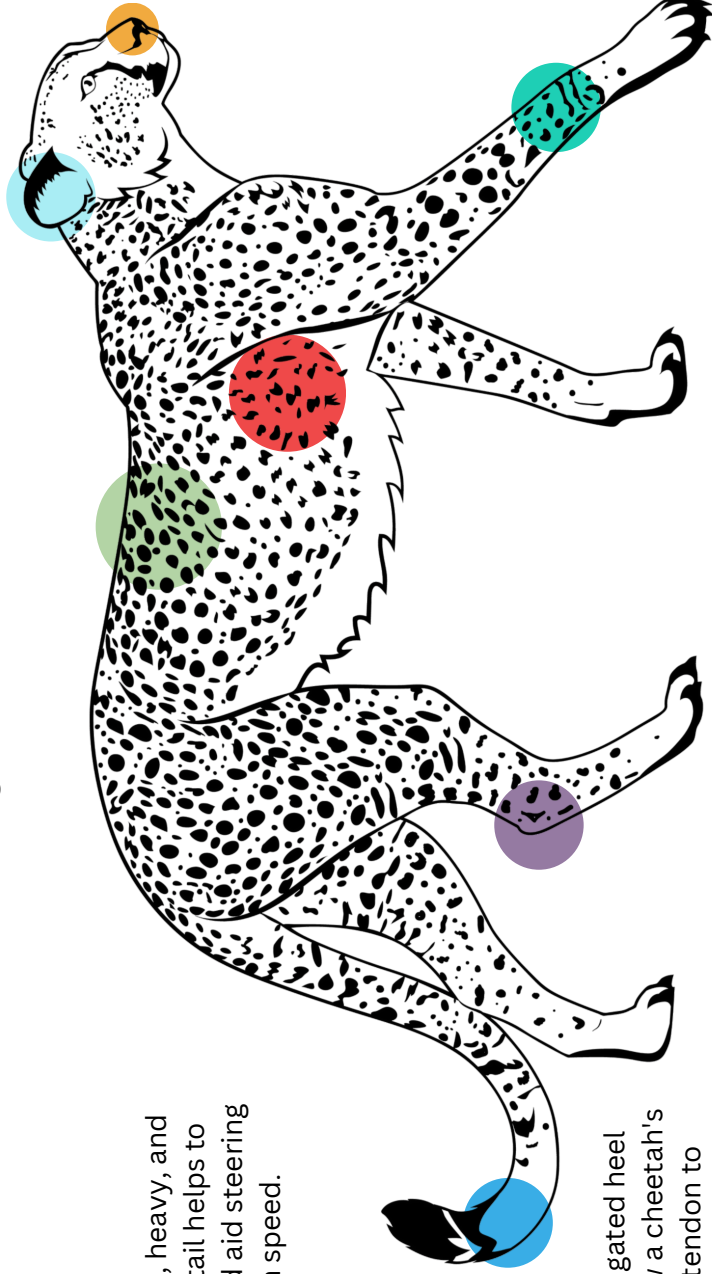
# CHEETAH ADAPTATIONS FOR SPEED

● **Spine:** A more flexible spine allows for stretching and bunching to achieve longer strides when running.

● **Ears:** Small, rounded ears fold back against the head to improve their aerodynamics.

● **Nose:** Enlarged nostrils and nasal cavities allow a larger intake of oxygen when they are running fast.

● **Tail:** A long, heavy, and flattened tail helps to balance and aid steering at high speed.



● **Feet:** Elongated heel bones allow a cheetah's Achilles tendon to achieve a spring-like effect, helping them jump and run better.

● **Lungs and Heart:** Larger lungs and hearts allow them to use more oxygen and produce more energy for running.

● **Low Weight:** Cheetahs are very lightweight for their size, which helps them be faster and more agile.



Cheetahs use a combination of specialized adaptations to achieve extraordinary acceleration. The concept of force—how mass and velocity interact—explains how they can reach speeds of up to 70 miles per hour. Their lightweight bones and powerful, fast-twitch muscles generate the bursts of power needed for rapid movement. A flexible spine works like a spring, extending and contracting with each stride to cover ground efficiently. Semi-retractable claws provide grip, like cleats, maximizing traction during sprints. However, this speed comes at a cost—cheetahs can only maintain it for short bursts due to the high energy demand. These adaptations make cheetahs expert hunters, perfectly suited for fast chases in open habitats.

## CHEETAH SPEED the science behind it

## CHEETAH SPEED lets talk about it

How did your speed compare to how fast a cheetah can run?

What factors do you think helped or slowed you down during your sprint?

Can you think of another fast animal? How is its body similar to or different from a cheetah's?

If you could change one thing about how you ran to improve your speed, what would it be and why?

Why do you think cheetahs need to rest after a sprint, and how might this affect their hunting strategy throughout the day?

# Getting into Position

## Cheetah vs. Sprinter: Masters of Speed

Both the cheetah and a sprinter rely on strength, balance, and body position to run fast. Let's take a look at how their movements are similar and what makes each unique.

## The Launch: Energy Ready to Burst

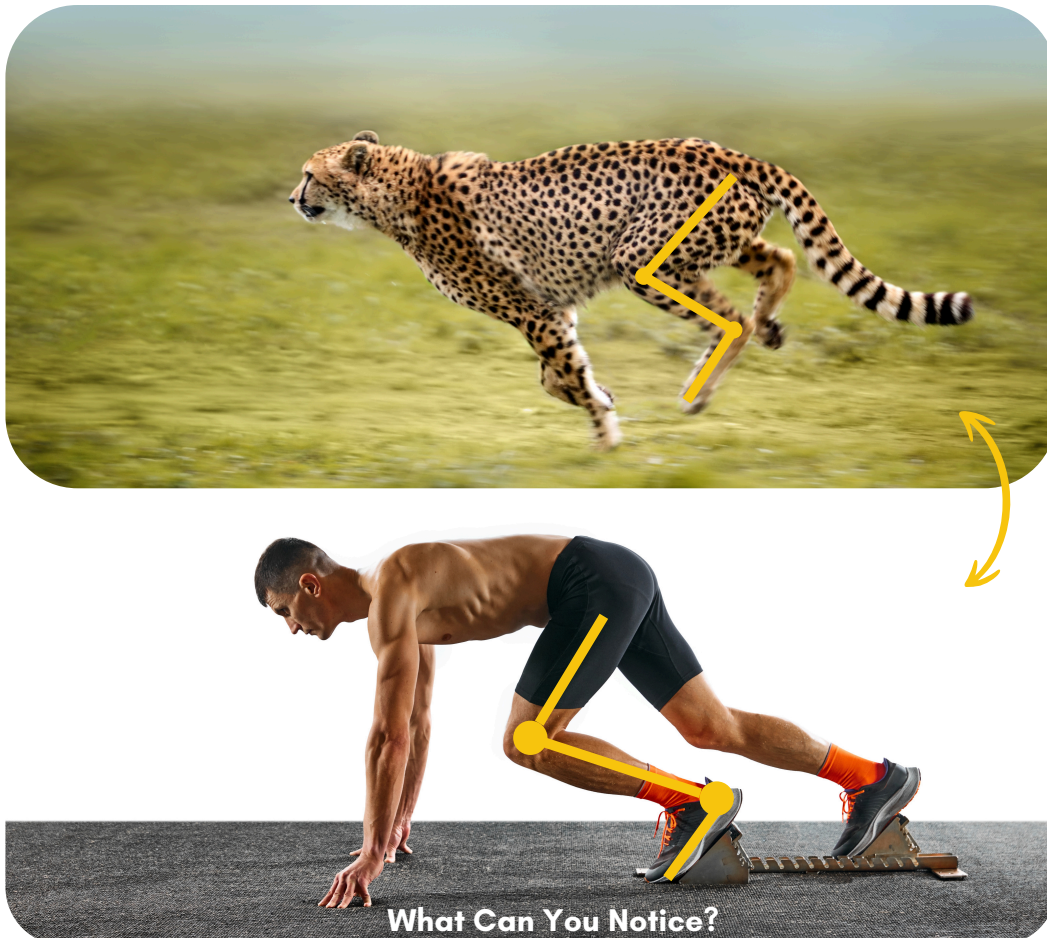
Cheetahs coil their bodies like springs before they sprint, storing energy. Similarly, sprinters use blocks to push off with power and accelerate as fast as possible.

## Stride and Movement

A cheetah's flexible spine helps it stretch further with each stride, covering more ground quickly. Sprinters, on the other hand, rely on muscle power and precise timing to maintain speed.

## Balance on the Run

Cheetahs use their tails to steer during sharp turns, while sprinters use spikes in their shoes for traction and stability on the track.

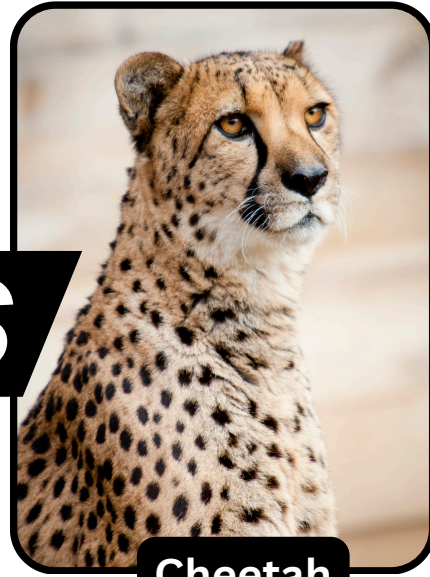


How does the starting position help both the sprinter and the cheetah run faster?  
Why might a cheetah need more balance during a chase than a sprinter during a race?

# What's The Difference?



**Leopard**



**Cheetah**

**VS**

## **SPOTS VS. ROSETTES:**

Cheetahs have solid black spots all over their bodies, while leopards have rosette-shaped spots (black rings with a lighter center).

## **BODY SHAPE:**

Cheetahs have a slim, lightweight build with long legs, built for speed. Leopards are stockier and more muscular, designed for climbing and strength.

## **SPEED VS. POWER:**

Cheetahs are the fastest land animals, reaching 70 mph in short bursts. Leopards are not as fast but are excellent climbers and can drag heavy prey into trees to keep it safe from scavengers.

## **FACE MARKINGS:**

Cheetahs have distinctive black "tear marks" running from their eyes to their mouths, which help reduce sun glare while hunting. Leopards don't have these marks.

## **SOCIAL LIFE:**

Cheetahs are more solitary, especially females, though males sometimes form small groups called coalitions. Leopards are also solitary, spending most of their time alone.

## **DIET:**

Cheetahs are carnivores that mainly hunt smaller prey, such as gazelles, impalas, and hares. They rely on speed to chase down prey. Leopards are also carnivores, but they hunt a wider range of prey, including antelope, monkeys, and even birds. Leopards rely on stealth and strength, ambushing prey and dragging it up into trees to avoid scavengers.