

# COWBOY SCIENCE



# RODEO S.T.E.A.M.



**NATIONAL  
COWBOY  
& WESTERN HERITAGE  
MUSEUM.**



## ALL ABOUT RODEO

### How did rodeo begin?

A long time ago, and still today, cowboys and cowgirls worked on ranches. They had to be good at riding horses and roping cattle. Sometimes, after a hard day's work, they would have fun contests to see who had the best cowboy skills. This friendly game of "showing off" was the start of what we call rodeo.

The word "rodeo" comes from the Spanish word "rodear." It means "round up." Spanish vaqueros (cowboys) in the Southwest and Mexico also had these kinds of contests. In the late 1800s, rodeos grew bigger and more organized. People started paying money to watch the cowboys and prizes were given to the winners. Soon, rodeo became an exciting sport with its own special events.



### Why rodeo is so important?

Rodeo is more than just a sport. It helps us understand about the brave spirit of the American West. It reminds us of people who lived off the land by courage and hard work. Many Americans, especially in the West, feel a special connection to the cowboy and to rodeo.

### Reasons why rodeo is so important:

**Rodeo Celebrates our History.** Rodeo shows us the important skills cowboys used every day on the ranch. It helps keep the story of the American West alive.

**Rodeos Bring Communities Together.** Rodeos are big gatherings where people of all ages can get together and have fun. There are parades, food, music, and of course, the contests.

**Rodeos Teach Good Values.** For the cowboys and cowgirls who compete, rodeo teaches a special code of honor. It's about being fair and respectful to others. They also learn how to take good care of their animals. Many children grow up in the rodeo world, starting with events like "mutton busting" (sheep-riding). As they get older, they develop a strong character.

### How important is rodeo in Oklahoma?

Because it was a frontier with lots of cattle ranches, Oklahoma was the perfect place for rodeo to grow. Many of the greatest cowboys and cowgirls in history have come from Oklahoma. Honoring the past, you can visit [the National Cowboy & Western Heritage Museum](#). It includes the [National Rodeo Hall of Fame](#) that honors the history and champions of the sport.



## SADDLE BRONC RIDING

### What is saddle bronc riding?

Saddle bronc riding is a rodeo event where a cowboy or cowgirl tries to stay on a wild, kicking horse for at least eight seconds.

### How do bronc riders use science?

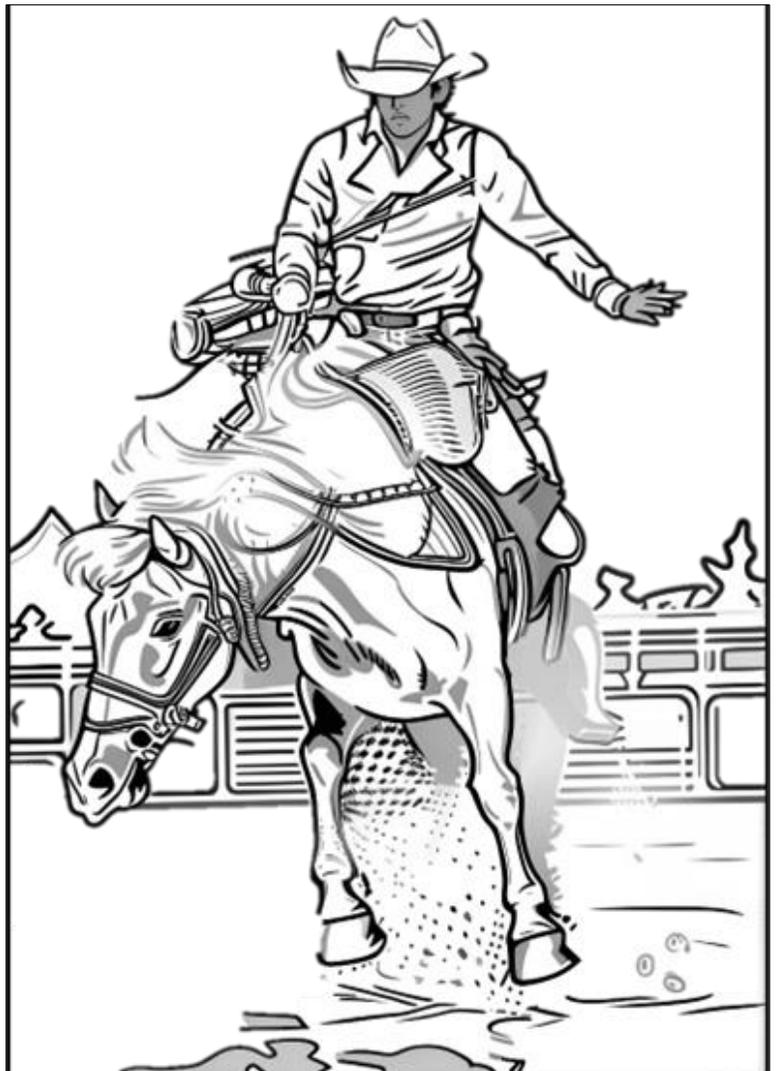
**Center of Gravity** is your body's balance point. A cowboy's main job is to keep his own balance point stacked right over the horse's back for the whole eight seconds. When a horse bucks high or twists, cowboys quickly adjust their hips, back and head. They are experts at moving their center of gravity to stay perfectly balanced, while keeping one hand in the air! Imagine this: If you stand on one foot, you lean a little to keep your balance point over that foot. The cowboy is doing this over and over, super fast, on a horse!

**Timing** is about when things happen and for how long. It's the rhythm of everything in the world. Bronc-riding cowboys have to move their bodies in perfect time with the horse's bucking. The horse is like a big spring that keeps going up and down. But cowboys use their legs to spur (scoring points) back and forth in a rhythm that matches the horse. And by moving their bodies with the horse, they become part of the motion, making it harder for the horse to throw them.

### DID YOU KNOW?

Rodeo animals are star athletes too. Midnight was a legendary bucking horse who became famous. Cowboys found him nearly impossible to ride. The strong black horse bucked off many top cowboys during his long career. Midnight's fame drew large crowds to rodeos across the country until his retirement.

### WATCH AND LEARN



## TIE-DOWN ROPING

### What is tie-down roping?

It is a rodeo event known as tie-down roping. A cowboy or cowgirl on horseback chases a calf, ropes it, jumps from the horse and tie three of calf's legs together as quickly as possible.

### How do ropers use science?

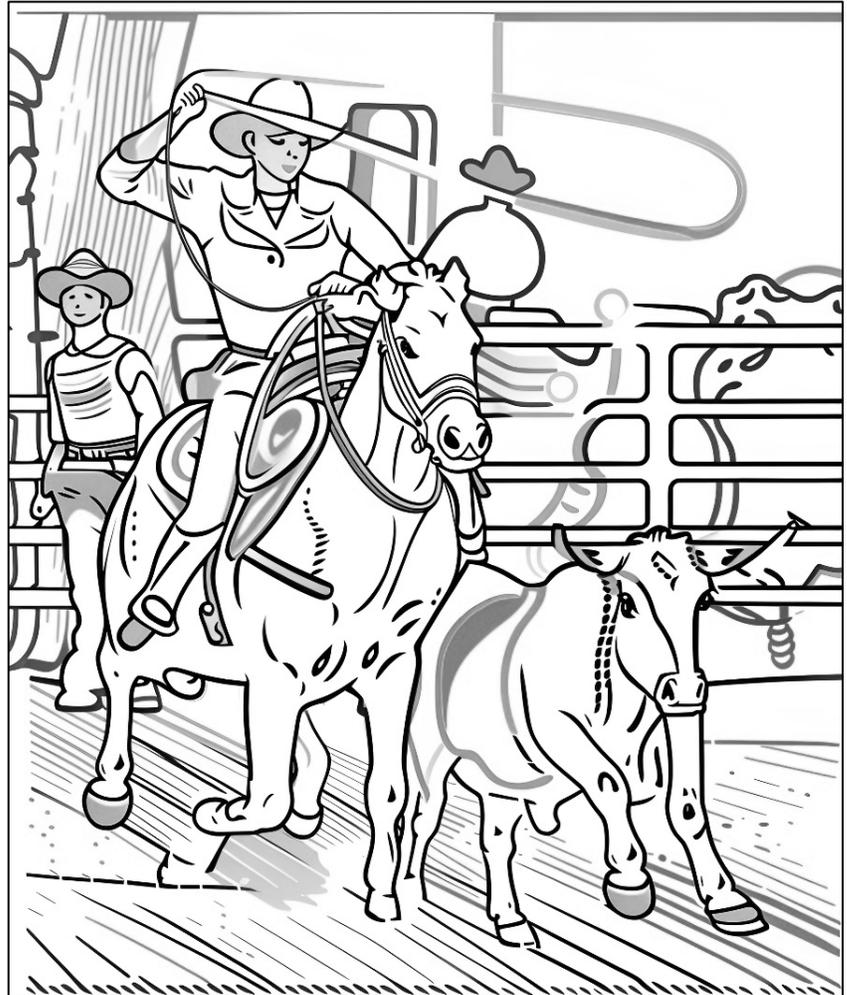
When cowboys rope cows, they use several principles of **physics**, including Newton's laws of **motion**, **centrifugal force**, and **trajectory**. A cowboy learns to use these scientific concepts through timing, skill and a well-trained horse.

Before a rope is thrown, the cowboy spins it to form an open loop.

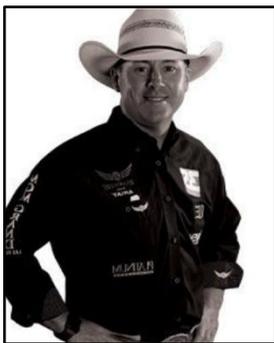
**Centrifugal force** (outward) helps the rope spin. The cowboy uses centripetal force to keep the loop open.

**Inertia** (keeping things in place) keeps the rope moving in a circle. The cowboy must spin the rope fast enough to overcome gravity. This is part of Newton's First Law.

**Trajectory** (the path an object takes as it moves) helps catch a moving calf. If a cowboy aims his rope well, it will travel in a predictable way. A cowboy must mentally plan the path, thinking about the animal's speed and direction.



### DID YOU KNOW?



Ever since he was a young boy in Amarillo, Texas, Trevor Brazile wanted to become a champion rodeo cowboy. Through hard work and practicing his natural skills, he eventually earned the nickname, "World's Greatest Cowboy." The facts back up that title. Brazile holds the world record for most PBRC championship titles (26) as well as the record for most All-Around cowboy World Championships (14)!



**WATCH AND LEARN**

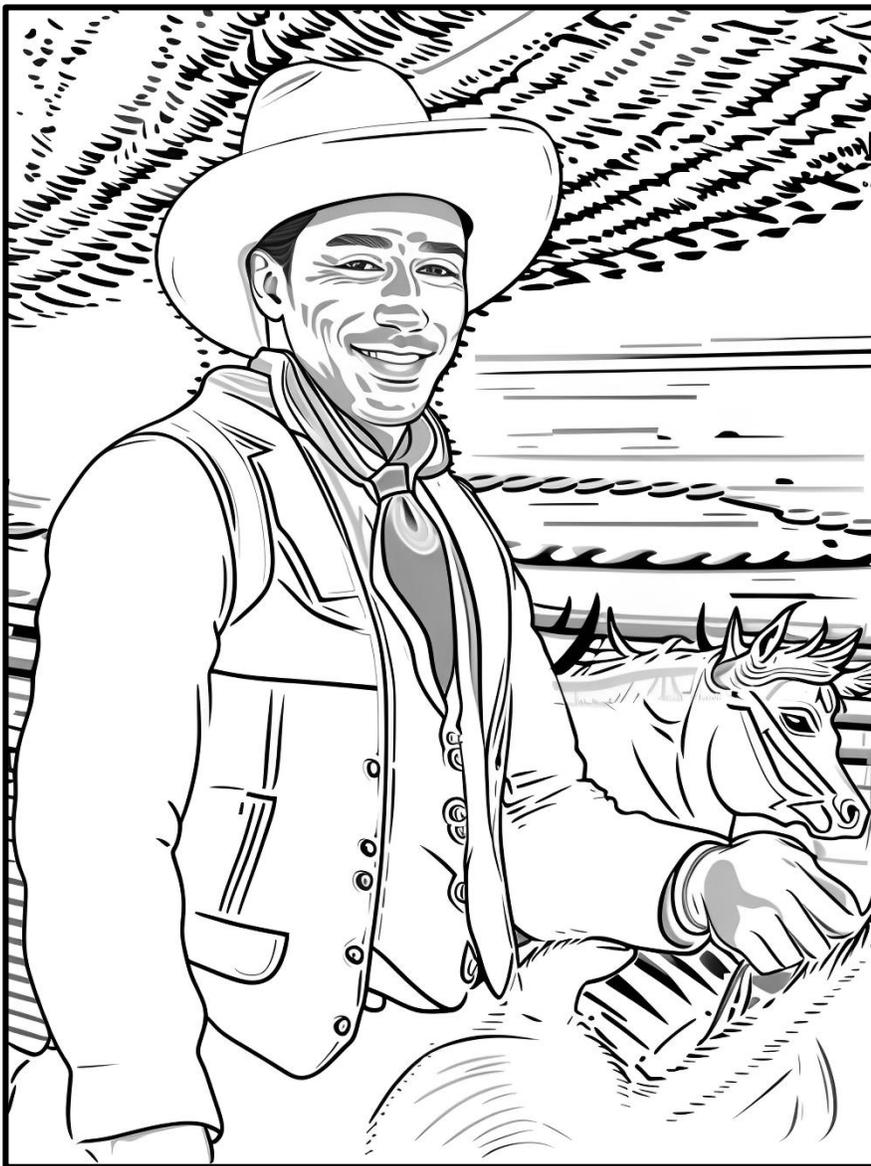
## STEER WRESTLING

### What is steer wrestling?

It is a rodeo event where a cowboy (“bulldogger”) chases a steer, jumps from his horse, and wrestles the steer to the ground. Steer wrestlers use science, such as **physics**. They use **leverage** to change the steer’s movement. All while using their own strength, speed, and coordination.

### How do steer wrestlers use science?

**Leverage** is based on a principle of science. A lever is a kind of simple machine that is used to move heavy objects or to pry things loose. Cowboys use their own body weight to create leverage against the steer’s head and neck. They unbalance the animal and pull the steer’s body around to help it fall.



### DID YOU KNOW?

Bill Pickett was a famous steer wrestler who invented “bulldogging.”

It helped him become a rodeo champion and entertain millions of people in Wild West Shows. Pickett was inducted into the National Rodeo Hall of Fame!

You can learn more about Pickett and see his saddle at The Cowboy Museum!

### WATCH AND LEARN:



## BARREL RACING

### What is barrel racing?

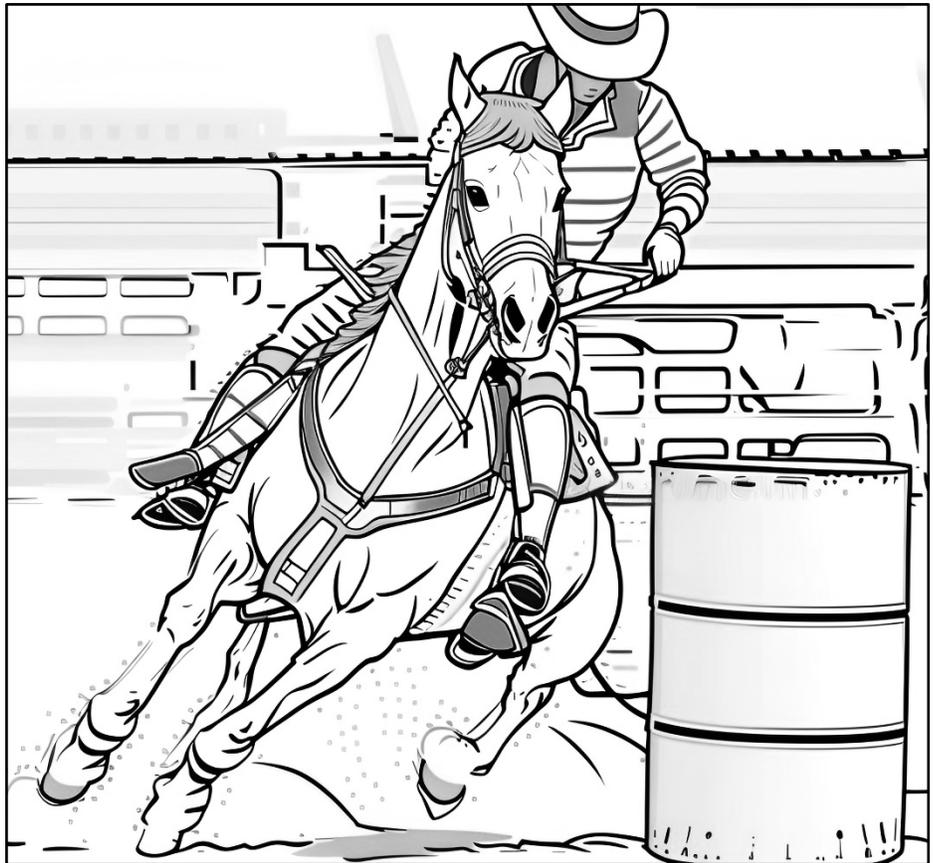
Barrel racing is a fast and fun rodeo event. But knowing science helps zoom around those barrels!

### How do cowgirls use science?

**Friction and Traction:** Friction is what happens when two things rub together, like your shoes on an icy street. Traction is the good kind of friction—it helps you grip. When cowgirls and their horse are running fast, they need the horse's hooves to grip the dirt so they don't slip when turning. The horse's shoes create the perfect traction.

**Speed** is how fast you are going. A big horse can run fast. Cowgirls want to keep the horse's speed up between the barrels. But they have to slow down before the turn. If not, their momentum will carry them past the barrel.

**Centripetal Force** is the inward-pulling force that makes things move in a circle. It stops the horse from flying off in a straight line when they turn. When the cowgirl pulls the reins to turn around a barrel, she and the horse have to lean in toward the barrel. Without centripetal force, they'd just run straight. By using science, cowgirls and their horses become super-speedy scientists of the arena.



### DID YOU KNOW?

Charmayne James and her horse, Scamper, were one of the most teams in rodeo history. Some thought Scamper would never turn out to be a good rodeo horse. But Charmayne did. She and Scamper won an amazing ten consecutive World Championships!

### WATCH AND LEARN:



## BULL RIDING

### What is bull riding?

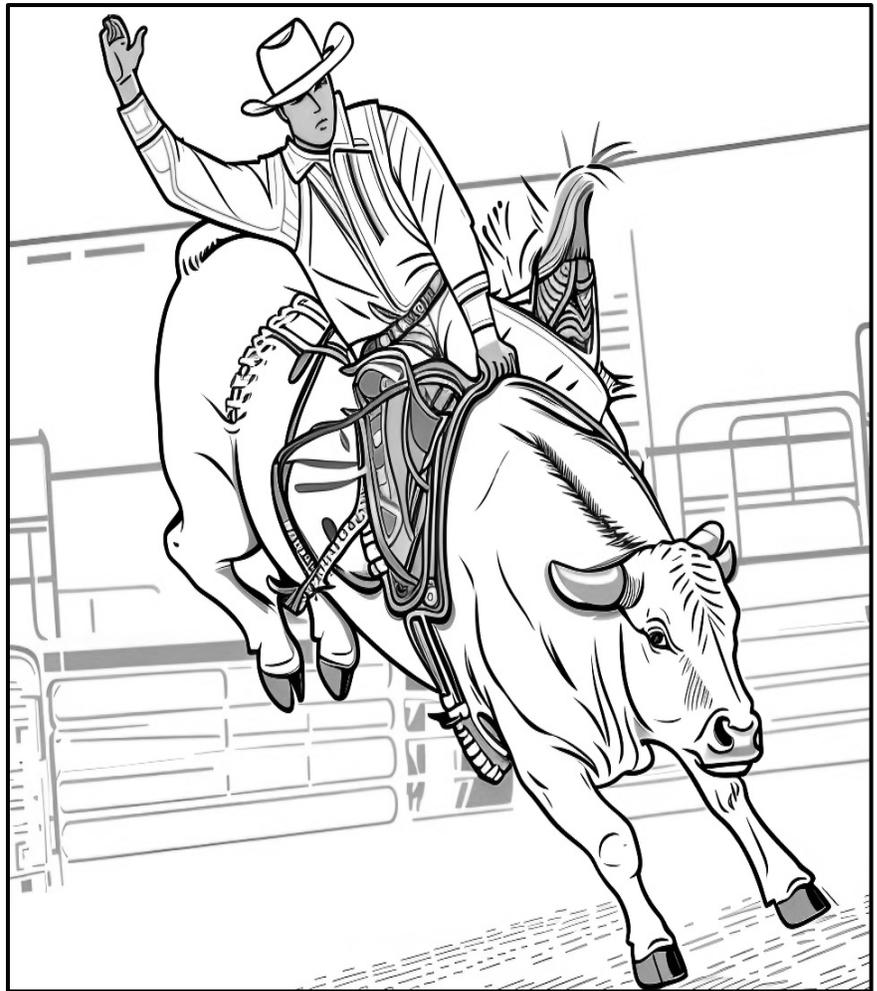
Some say it is the toughest rodeo event! Bull riding is also a science contest where the cowboy uses his brain and his body to be stronger than a giant, spinning bull- for a full eight seconds!

### How do bull riders use science?

**Centrifugal Force** is the force that pushes you out when spinning in a circle. You feel it when you ride a spinning ride at the park. Bulls are famous for their spins! When a bull spins fast, it creates a huge centrifugal force that tries to fling the cowboy into the air. To fight this, cowboys must lean into the spin! If the bull spins to the left, the cowboy leans left, keeping his body straight up and down over the middle of the bull. This helps the bull's center of gravity stay under him, fighting that "spinning-out" force.

**Inertia** is a science rule that says things usually just want to keep doing whatever they were just doing. When the bull jumps high and then suddenly drops low, the cowboy's body wants to keep going up (inertia!). That's when the bull tries to flip him over the front! But cowboys use their core (tummy muscles) and legs to act like a rubber bands, snapping them back down onto the bull.

Cowboys use their strength to stay super close to the bull and fight that inertia!



### DID YOU KNOW?

Ty Murray is one of the greatest all-around cowboys, with nine world championships. His bull riding titles and work as co-founder of the Professional Bull Rides (PBR) is legend. When he retired, he was simply known as the "King of the Cowboys." The PBR Heroes and Legends is housed in the National Rodeo Hall of Fame.

### WATCH AND LEARN:



## BULLFIGHTERS

### Who are bullfighters?

Once they were called the "rodeo clown." But now we now called them Bullfighters because their job is all about courage and safety. They use their bravery, along with science, to save the cowboy!

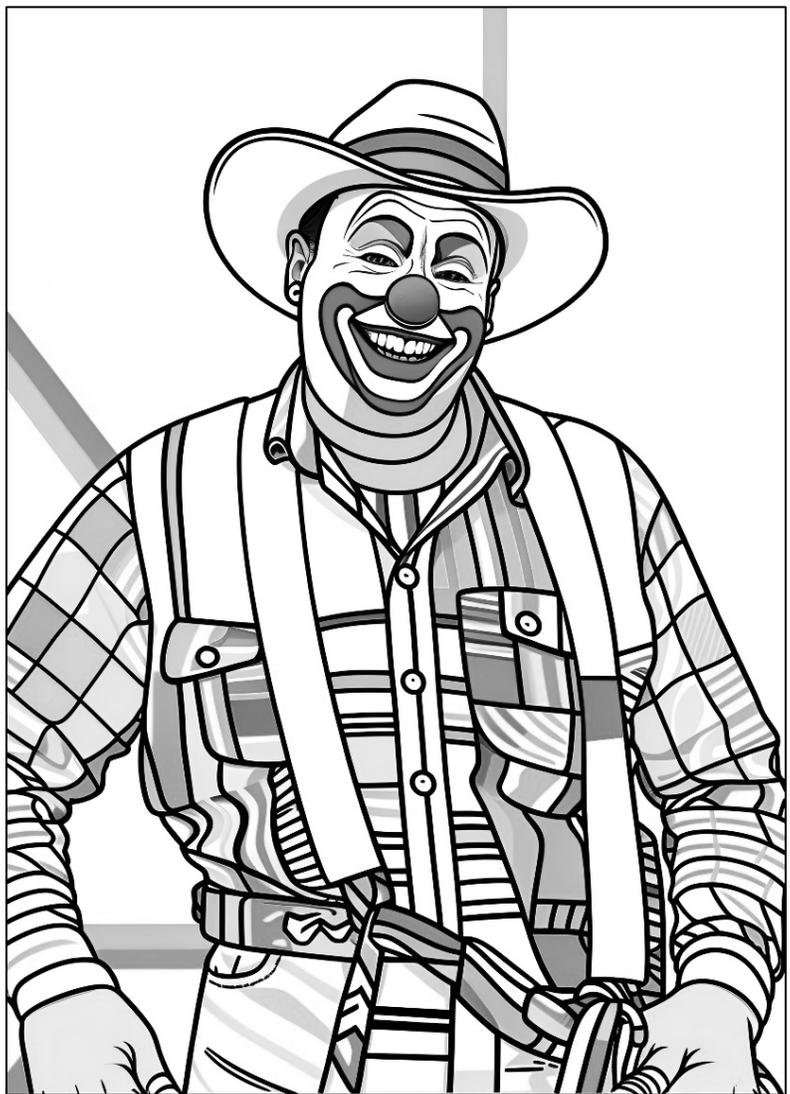
### How do bullfighters use science?

**Psychology** is the science that studies how living things think and act. A bullfighter knows exactly how a big, angry bull is thinking! When a bull throws a cowboy off, the bull is usually mad. The bullfighter tries to become a bigger and more interesting target. By running, yelling, and waving their arms, they get the bull's attention away to the cowboy won't be hurt.

**Momentum** is the power of motion. Heavy things, like a big bull, move fast and have a lot of momentum. Bulls are hard to stop or turn. Bullfighters know that they can't stop the bull, but they can trick them! When the bull charges, bullfighters run at an angle (not straight). Just before the bull gets to them, they make a super-quick hop to the side. The bull's momentum makes it hard for it to turn quickly. Cowboys now have time to get up and run away!

### DID YOU KNOW?

Leon Coffee is a legend! As a rodeo clown and barrel man, people loved him for his humor and his bravery. He used his understanding of science to protect cowboys for over fifty years. People called him "Disco Bullfighter" for the way he got bulls' attention with dancing. Coffee was inducted into the National Rodeo Hall of Fame for his amazing career.



**WATCH  
AND LEARN:**

