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Abstract: The article offers information on several amusement rides. Such rides include the Kingda Ka roller coaster at Six Flags Great Adventure in New Jersey, the giant Ferris wheel in Beijing, China and the Master Blaster, a water slide at Schlitterbahn Waterpark in Texas. It highlights the forces that drive the motion of the said rides such as the kinetic energy, the gravitational potential energy and the hydraulic power.

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Scream Machines

Discover the forces behind some heart-pounding rides

If you're headed to an amusement park this summer, get ready to be blown away. Today's rides are more hair-raising than ever.

Whether the ride is a slippery water slide or a towering roller coaster, the secret to its stomach-flipping fun is physics. So before you get in line, check out how four of the world's wildest rides deliver their thrills.

[Blast off](#)

The first minutes on a roller coaster used to be a sluggish ride, as a chain pulled the cars up the initial hill. That's far from the case on the Kingda Ka coaster at New Jersey's Six Flags Great Adventure.

At takeoff, daring riders on the world's fastest roller coaster rocket from 0 to 205 kilometers (128 miles) per hour in just 3.5 seconds. This thrilling start is driven by hydraulic motors, which are driven by fluid at a very high pressure. This pressurized fluid stores energy. To launch Kingda Ka, ride operators release the pressure on the fluid. That turns the stored energy into kinetic energy that shoots the cars up the first hill in 10 seconds flat.

[Water Power](#)

On most water slides, you zip down slippery slopes. On the Master Blaster, a water slide at Schlitterbahn Waterpark in Texas, riders slide uphill too.

Like other water slides, the Master Blaster starts at the top of a tall hill on the slide. At a height of 18 meters (60 feet), riders have a lot of gravitational potential energy. When they push off, gravity pulls the riders down the steep hill. The gravitational potential energy converts to kinetic energy.

To boost riders back upward, the slide is fitted with powerful water jets at the bottom of each hill. On the base of the slide, water that had been flowing through a large pipe is squeezed through a smaller opening. Pushing the water through the small hole increases its pressure. Like a super squirt gun, the pressurized water shoots riders uphill.

Ultimate View

You may not think of a Ferris wheel as the most exciting ride in the park. But a new wheel in Beijing, China, is sure to get hearts pounding. When completed in 2009, the Beijing Great Wheel will be the world's tallest observation wheel. It will carry riders 208 m (682 ft) in the sky.

The giant wheel has special features that keep riders safe at that towering height. Since the wind can blow harder higher up, riders will not be sitting in open, swinging seats like the ones on smaller Ferris wheels. Instead, they will enjoy the extreme view from closed cabins that hold up to 40 passengers each.

To cut down on wind resistance on the wheel itself, the designers made the rim with open rungs like a ladder. This construction allows wind to blow harmlessly through the rim, instead of slamming against it.

Free Fall

For people who want to feel what it's like to jump out of an airplane, Drop Zone at Ohio's Kings Island is the ultimate ride. It is the tallest drop tower in the world. Seated in a ring around a tower, riders are lifted 26 stories. Then, the car suddenly drops and riders plunge toward the ground.

Drop Zone has a magnetic braking system. About halfway down, the force of high-strength magnets starts to slow the ride. Since the magnets don't rely on electricity, they would work even in a power outage. Besides being reliable, magnetic brakes are smooth and quiet. All the screeching is left to the riders.

Words to Know

Hydraulic — operated by the pressure of fluid

Kinetic energy — energy of motion

Gravitational potential energy — stored energy an object has because of its vertical position

Resistance — a force that prevents motion or slows it down

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By Judith Jango-Cohen

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