
Smithsonian
HIGH-SPEED
CARS
Heather E. Schwartz
TCM
Teacher
Created
Materials

Table of Contents

Speed Is Spectacular

All kinds of cars zip through the streets. They are also parked in parking lots, on driveways, and on side streets. They're such a common part of our everyday world that we hardly notice them. But when they go superfast, we can't look away!

High-speed cars attract attention whether they are on the road or on a racetrack. The bodies of these cars draw our eyes because they're different from ordinary cars. Their shapes aren't quite the same as the standard cars most people use. Plus, when these cars are on regular roads, driving the **speed limit**, they have the potential for more.

When high-speed cars take off on a racetrack, their speed is astonishing. Race cars seem to fly by as they battle full force for the lead position. It's easy to tell from the sounds they make that their engines are built differently under the **hood**. Ordinary cars can't be driven in the same way as high-speed cars. And until recently, even cars built for racing couldn't hit the astounding speeds they reach today.

The history of high-speed cars starts with the invention of the first modern **vehicle**. With continuing technological advances and record-shattering races, there is no finish line in sight!

ARTS

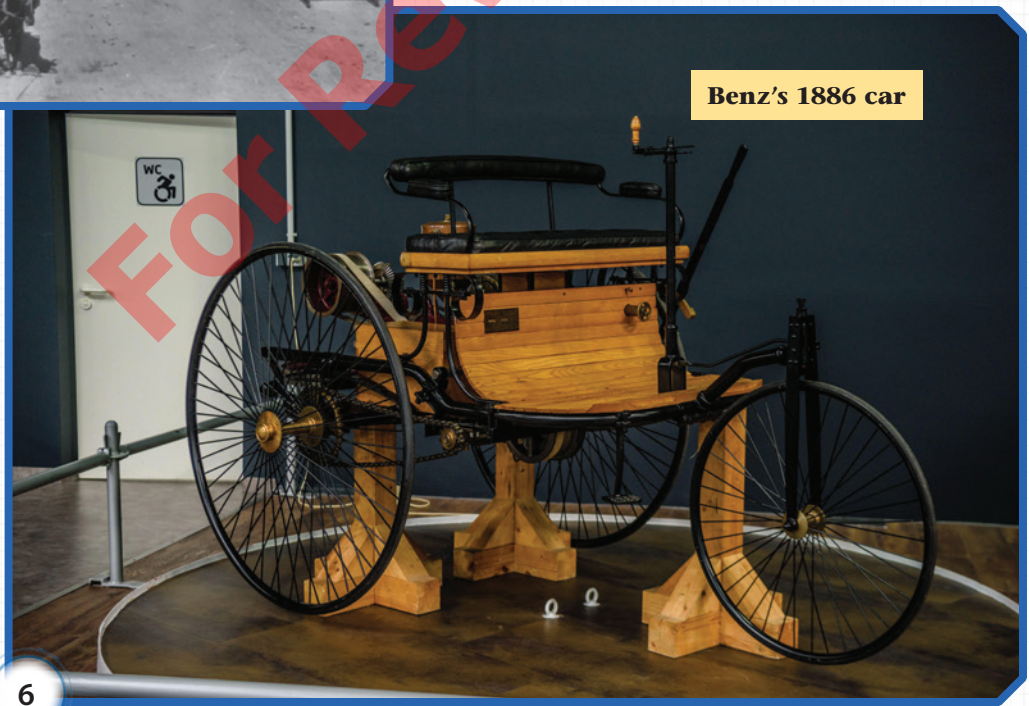
Wrapping Race Cars

Some race cars do not use paint for their exterior colors. Instead, **vinyl** wraps give race cars unique appearances. Putting a vinyl wrap on a car involves applying a large sheet of vinyl like a big sticker to the body of a car. These wraps can have special designs and unique, **iridescent** colors.

High-Speed History

Before cars were invented, people used horse-drawn carriages to get around their cities and towns. But this type of transportation was slow and inefficient. People wanted to invent new vehicles that would help them travel to and from places more quickly.

In 1886, an engineer named Karl Benz created a new kind of vehicle. He hit the streets of Germany with the first modern car. His car was powered by an **internal combustion engine** that ran on gasoline. Benz had built on other inventors' ideas, but he was the first person to put the engine to work in a car. This allowed the car to reach a top speed of 16 kilometers (10 miles) per hour.



Benz's 1886 car

Other inventors saw the potential in Benz's car and began to work on improving the design. They wanted to make cars that would go faster. By 1894, drivers had begun to race their cars and hit new top speeds. In 1895, the first real car race took place in France. The winner reached an **average** speed of 24 km (15 mi.) per hour. At the time, this vehicle was considered a high-speed car.

By 1900, race cars could go nearly 48 km (30 mi.) per hour. These cars were raced on roads that were designed for horse and wagon traffic and not for cars. This made car racing especially dangerous.

The Paris–Bordeaux–Paris Trail race of June 1895 was the first car race.

Further Developments

In 1911, the first Indianapolis 500 took place. This U.S. car race happened at the Indianapolis Motor Speedway, which had a track for testing cars. In this race, high-speed cars reached nearly 120 km (75 mi.) per hour. Over the next 60 years, these high speeds more than doubled. By the late 1970s, cars that raced in the Indianapolis 500 were hitting close to 260 km (161 mi.) per hour. That is much too fast for regular roads and highways.

Indianapolis 500 in 1911

Indianapolis 500 in 1978

Driving at high speeds and winning races have always required a lot of skill. But drivers weren't the only ones in charge when it came to how fast their cars could go. Companies started building race cars with speed in mind every step of the way. They thought about **velocity** when they built the engines. They designed car bodies to move forward with ease.

Race cars weren't the only high-speed cars in development. Hypercars, the highest performance and most expensive high-speed cars, were also in the works. **Luxury carmakers** began building these cars to be legal to drive on racetracks—*and* on regular roads! In 1987, the Ferrari F40 had a top speed of 323 km (201 mi.) per hour. In 1993, the McLaren F1 hit 386 km (240 mi.) per hour. That record was broken in the early 2000s. And every year since, carmakers have continued to build new cars, testing the limits of speed.

FUN FACT

Carmakers around the world build high-speed cars. For example, Ferrari is based in Italy. McLaren Automotive is based in England. These luxury brands—and many others—are well-known throughout the car industry.

Ferrari factory in Italy

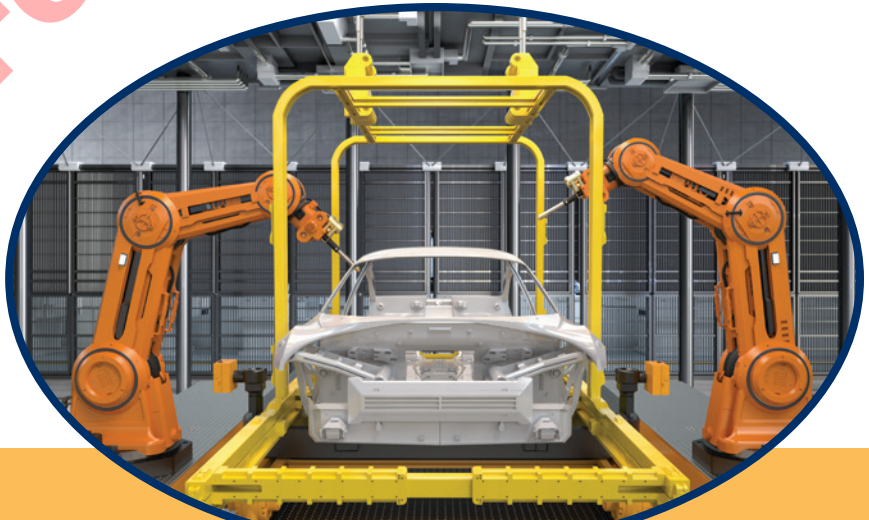
STEAM CHALLENGE

Define the Problem

Autonomous, or self-driving, vehicles are becoming more common. Carmakers are trying to reduce the amount of gas and electric energy these cars use. Engineers are seeking to build lightweight vehicles that minimize friction from the air and ground to conserve energy. They have asked for your help to design two autonomous car models. Then, you will choose one to build and test.

Constraints: You can only use the materials that are provided. You may only test your car on the approved ramp.

Criteria: Your car should roll down the ramp as quickly as possible and weigh the least amount.



CAREER ADVICE
from Smithsonian

Do you want to work with cars?

Here are some tips to keep in mind for the future.

"Take what you are learning about engineering and technology in school, experiment with those ideas, and apply your experience to building your own fast-moving vehicles, whether they be models, remote-control cars, or, when you get older, full-size automobiles."

*– **Jeremy Kinney**, Associate Director of Research, Collections, and Curatorial Affairs, National Air and Space Museum*

"There's always room for improvement in cars and users are often the best inventors. Keep your ideas in a notebook and send ideas to manufacturers or explore patenting them yourself."

*– **Kathleen Franz**, Chair and Curator, Division of Work & Industry, National Museum of American History*

Read and Respond

1. How was the first modern car invented?
2. How are high-speed cars designed to go faster than ordinary cars?
3. What chemical reaction takes place in car engines, and how does it work?
4. What might happen to a race car racing in the rain?
5. What features help race cars beat air resistance?
6. Is it a good idea for carmakers to keep trying to make cars that will go even faster? Explain your reasoning.