The History of Cars

Background Information for Teachers

Our World is a Car World

Try to imagine our world without cars. Of course not every person in the world owns or even needs a car to live their lives. However, in North America our quality of life is often defined by the power and style of our vehicles. It is important to us that our cars take us to where we need to be and to where we want to go. They get us to work and take us out to the movies. Today, we'd be hard pressed to get our groceries, let alone go on vacation without the vehicles that we drive or even the public transportation that we use. Some of us even drive our cars for pure enjoyment.

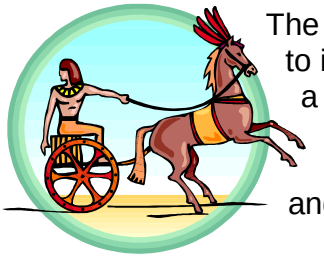
The Wheel

The invention of the wheel paved the way for transportation as we know it today. Historians don't know exactly who invented the wheel, but the oldest wheel discovered so far is believed to be over 5,500 years old.

The development of the wheel began when humans sought easier methods for moving large objects. It was recognized that round objects, such as a log, could be placed under something heavy to push it along with less force.

Next humans began using a sledge. A sledge is essentially what today we would call a sled. A sledge worked well over smooth ground or with logs placed under it as it was pulled along. Eventually the sledge wore grooves in the log rollers. The grooved rollers worked better since there was less friction between the sledge and the rollers, so less energy was needed to drag the sledge.

It wasn't long before humans cut away the wood between the two inner grooves created by the sledge. The wood left between the grooves became the axle. These were the first carts. Next, axles were designed to fit through holes in the center of each wheel. Finally, axles were designed not to move themselves, but rather to have the wheel rotate on the axle.

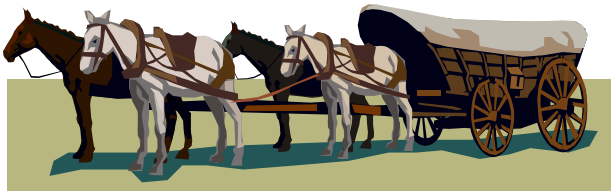


The ancient Egyptians, Indians, Greeks and Romans continued to improve the design of the wheel, adding spokes and creating a variety of wheels for different sorts of vehicles including chariots for war, hunting, and racing, two-wheeled farm carts, covered carriages, heavy four-wheeled freight wagons and passenger coaches.

Horse Power

For centuries wheeled vehicles were pulled by oxen, horses or even people. Until the invention of the internal combustion engine, the horse was Europe's most important source of energy. The term 'horsepower' is still used today to measure the power limits of machine engines.

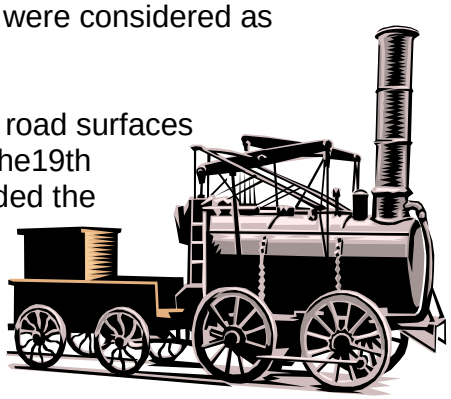
Horses allowed civilizations to extend their power and expand their territories. When paired with wheeled vehicles such as carts, chariots and carriages, this harnessed power allowed people more freedom to travel, explore and settle new land.



However, even horse drawn transportation came with its own source of pollution. Waste from horses was a serious concern in cities and it became more and more difficult to maintain sanitary conditions as the number of people and, therefore, horses grew. Concerns over these conditions led some innovators to look towards alternative forms of transportation.

Steam Powered Vehicles

In the 1700s, steam-powered vehicles, dubbed “horseless carriages,” came on to the scene. However, it was not until the early 1800s and the invention of the high pressure steam engine that these steam-powered vehicles were considered as potentially practical.

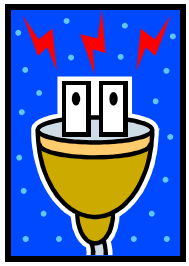


Limitations in building technology and the poor condition of road surfaces limited these “steam cars” as personal transportation until the19th century. At first, their sheer heaviness meant that they needed the support of iron rails to move effectively. This of course led to the use of steam engines in trains, thus powering the railroad industry. By 1902, 485 out of 909 new car registrations were for steamers. In 1906, the land speed record was broken by a Stanley steam car. The car and driver reached 127 miles per hour!

The steam engine powered the vehicle by burning wood, coal or oil to heat water in a boiler. The steam that was generated drove pistons up and down within hollow cylinders. The movement of the pistons drove the crankshaft, which ultimately turned the wheels.

In addition to their considerable weight, steam powered vehicles had several other disadvantages. They required long start-up times and required frequent stops to get water.

Electric Vehicles



In the 1830s, inventors also began to use electric motors to power vehicles. Like electric cars today, they ran on energy stored in rechargeable batteries. Unfortunately, the energy storage capacity of the early batteries was very limited, and these vehicles could travel relatively short distances before the batteries needed to be recharged. Although the range of early electric vehicles was limited, they could travel further on a single charge than steam-powered vehicles could go without stopping to renew their water supply.

Initially, the electric car's limited range was not a liability because the only good roads at the time were in towns. The electric car also had several advantages over other types of vehicles until the early 1900's. Driving electric cars, like steam-powered vehicles, did not require changing gears, which was a difficult maneuver in driving early gasoline-powered cars. In comparison to cars with gas engines, electric vehicles were also quieter, offered a smoother ride, and were relatively odor-free. They also did not require a long start-up time like the steam car or the considerable manual effort that was required to start a gas-powered car with a hand crank.

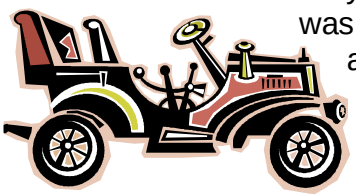
In 1899 and 1900, the sale of electric cars surpassed those of all other types of vehicles in the U.S. However, the prominence of the electric car was destined to be short-lived as several developments shifted the advantage to gasoline-powered vehicles.

Internal Combustion Engines

As more and more good roads were built to connect cities, the electric car's limited range eventually became a liability, and vehicles with gasoline engines, which had a much longer range, became more popular. Other developments also helped the gas-powered car gain prominence. The price of gasoline became more affordable with the discovery of vast oil reserves in Texas in 1901, and the introduction of the conveyor belt assembly line system by Henry Ford in 1913 reduced production costs of gas-powered vehicles, making them more affordable as well.

However, the development which had the biggest impact was probably the invention of the electric starter in 1911. Before this invention, gasoline-powered internal combustion engines had to be started by a hand crank. The hand crank was difficult to use and sometimes even quite dangerous. Improper cranking could cause a backfire strong enough to break the arm of the cranker! With the invention of the electric starter, cars with gas engines became safer to start and what had been the electric car's major advantage was eliminated.

Car Culture



Owning a car in the 1890s was like owning a private plane today. Thanks to the success of assembly line production, Ford's Model T became the first car that was affordable to the masses. The Model T was produced on an assembly line by workers who were paid a wage proportionate to the cost of the car. This method of production "put America on wheels," and the Model T was declared the most influential car of the 20th century.

Lives changed in the United States as people took advantage of the freedom cars afforded them. Americans embraced automobiles as they became an integral part of farming, industry and family transportation. Our communities have expanded; we can travel further on vacation and see more of our world. We now receive goods from all over the world to supply our needs.

Cars of the Future

The invention of the car has certainly shaped cultures around the world. But will cars always be our primary source of transportation? Serious concerns about air pollution from exhaust emissions and its contribution to global climate change are forcing us to consider alternatives to the internal combustion engine and to look for alternative energy sources. Today, more and more people are driving electric cars and hybrid vehicles, which use a combination of electrical and gas powered energy. The benefits of electric and hybrid vehicles are that they run quieter and cleaner and can reduce our current dependency on petroleum while limiting our contribution to accumulating greenhouse gases.

In the early 1900's, some predicted that road travel would be a thing of the past before the end of the century. They believed that it would not be long before we'd be getting around in our own little aircraft. Many of us do dream of a day when our vehicles will get us where we want to go faster, easier, cheaper and cleaner!

The young scientists that sit and learn before our very eyes have ideas of their own. Let's give them the knowledge, tools and time to dream.