

# Keeping Healthy

Being sick is no fun. Just a cold can make you feel rotten, and there are some serious diseases that can kill people. Many years ago doctors could only guess what was wrong; they could do little to make things better. Today we know much more about how our bodies work so we are much healthier.

## The Enemy Detected

For thousands of years people blamed sickness on lots of things: bad air, too much blood, even demons. It wasn't until 1864 that Louis Pasteur discovered **bacteria**, tiny living things that can get into your body and make you sick. English doctor Joseph Lister then developed the first **antiseptic** to kill these germs during surgery. Years later, penicillin, a type of mould that stops bacteria growing, was discovered by Alexander Fleming. Today humans consume about 235 million doses of **antibiotics** like penicillin year.

*Bacteria that cause disease are so tiny that millions could fit on the head of a pin.*

## Helping Your Body Fight

Your body has an **immune** system that protects you against many diseases. However, sometimes the body needs a helping hand. In the eighteenth century, Edward Jenner found that by giving people cowpox, a mild disease, they became immune to the deadly smallpox. A **vaccine** gives you a weak dose of a disease so your body is better able to fight it next time. You will have been vaccinated against lots of diseases so you are much less likely to catch them.

*Doctors laughed at his ideas, but Jenner was so sure it would work that he vaccinated his own son against smallpox.*



## Sleeping Through Surgery

Imagine being awake while doctors operated on you! That's what it was like 200 years ago. Sometimes patients were knocked unconscious with a bang on the head—but the surgeon had to work fast and people often died from the shock. Relief came with the invention of anaesthetics, chemicals that make you numb or put you to sleep. William Morton was the first to use anaesthetic during surgery in 1846. With the patient comfortably unconscious, the doctor could take his time.

*Modern surgeons do many wonderful things, but none of it would be possible without anaesthetics.*

*This person is wearing a hearing aid.*



## The Deaf Can Hear

The chatter of friends; a great song; the crash of the ocean. Most of us take these sounds for granted, but some people never hear them. People can be born deaf or go deaf later, because of sickness or injury. Hearing aids just make sounds louder; they don't work for everyone. In 1978 an Australian scientist, Graeme Clark, invented the cochlear implant or 'bionic ear'. This machine turns sound into signals that are sent through wires to the brain. Suddenly many deaf people could hear again. Graeme Clark had to pay for his own research, so he spent lunchtimes standing on street corners shaking a tin to collect donations.

## What's Going on Inside?

For centuries, doctors had no way of knowing exactly what was happening inside a sick person's body. They could only treat the symptoms. The stethoscope, invented in France in 1816 by René Laennec, let doctors hear the sound of the heart clearly for the first time. Eighty years later, the first **X-rays** were used to look at diseased organs and broken bones. Today we have machines that can scan every part of our bodies, inside and out, and in 3-D. Doctors are no longer in the dark.

*Wilhelm Rontgen realised the importance of X-rays for the medical world, and won the first ever Nobel Prize for Physics for his work.*

## Making Babies

A baby is created inside its mother's body, when the father's sperm enters and fertilises the mother's egg. Sometimes this can't happen naturally. During the 1970s scientists worked out how to bring the egg and sperm together outside the mother's body. The fertilised egg is then put back into the mother to grow normally. This process is called in-vitro fertilisation (IVF) and although known as 'test-tube babies', the embryos are actually fertilised in a shallow dish, not a test tube at all!



# On the Move

For thousands of years humans had only two ways to move across the land—either on foot or carried by an animal. Over water we could go faster, thanks to the wind in our sails. But to cover any sort of distance at a decent speed, we had to wait for the invention of engines running on steam and then petrol.



## Pedal Power

The bicycle was the first real innovation for saving leg work! The earliest bicycle—or ‘running machine’—was made entirely of wood and had no pedals. Riders sat and pushed the ‘hobby horse’ along with their feet on either side. In 1861 Ernest Michaux added pedals and iron-rimmed wheels, and the bicycle was born. But it was James Stanley, in the 1890s, who fine-tuned the design that became the model for your bike today.

*The ‘penny-farthing’ was prone to accidents, as the slightest bump in the road could send the rider flying over the handlebars!*

## Steam Across the Water

From the earliest days of the steam engine, inventors dreamed of boats powered by steam replacing oars and sails. In 1802, after several failed attempts around the world, Scotsman Lord Dundas successfully launched the *Charlotte Dundee*, a paddle-wheeler with a steam engine. At the same time, American Robert Fulton built his own paddle-steamer and began a passenger service on the Hudson River, New York. Within a century, big steam ships could safely cross the Atlantic Ocean in a week or less.

*Although paddle-steamers looked attractive, they were slow and uneconomical.*



## Sailing Under the Water

Submarines seem fairly high-tech and modern, but one fought in the American War of Independence in 1776. Designed by a college student, David Bushnell, and christened the ‘Turtle’, it was made of wood, carried only one man and had no engine. Today’s submarines can be as long as two football fields. They are made of steel and are as heavy as 12 000 cars. They can carry a large crew and be fitted with powerful weapons. Some have engines driven by nuclear power and can stay submerged for weeks.

*Nuclear power doesn’t require air, so it is an excellent power source for submarines. Nuclear-powered submarines only have to refuel once every nine years.*



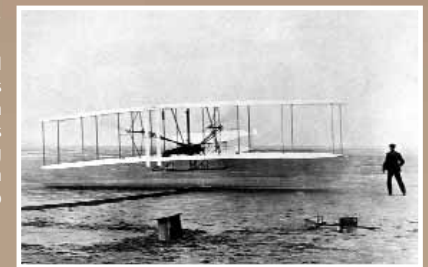
*Cars may have been too successful—with over five billion now driving all over the world, it can be difficult to get anywhere fast!*

## The World On Wheels

Some say the motor car or ‘automobile’ is the most important invention ever, and it certainly is hard to imagine our world today without cars. Yet we haven’t had them for long. In 1886, Gottlieb Daimler fitted the newly invented four-stroke petrol engine to a stagecoach, and the automobile was born. His rival, Karl Benz, became the first to mass-produce cars. With the popularity of cars have come problems—pollution, traffic jams, road accidents—but most of us wouldn’t be without one.

## We Take to the Air

For centuries humans tried to fly like birds. People flapped wings made of feathers or wood...often with disastrous results. We first took to the sky in 1783, in a hot-air balloon invented by the Montgolfier brothers. The Wright brothers then succeeded in building an engine-powered ‘flying machine’, and took the first flight at Kitty Hawk, USA, in 1903. Today, hundreds of people can travel in a jumbo jet to the other side of the world in a matter of hours.



*Wilbur and Orville (at controls) Wright with their 1903 airplane at Kitty Hawk. Its first flight lasted twelve seconds.*

## Triumph of the Train

George Stephenson, a young British engineer, built the first steam locomotive engine for railways, in 1814, and travel changed forever. Trains were safe, reliable, punctual, comfortable, cheap and fast. A trip that took a week on a horse or by stagecoach could now be done in half a day. Almost 70 years later, electric and diesel trains appeared, followed by high-speed engines such as Japan’s Bullet Train and the French TGV, which travel at speeds of up to 300 kilometres per hour or more.

*Every part of the steam engine had to be made by hand, and hammered into shape. George Stephenson built 16 engines in all.*

