

HISTORY COURSE

The History of the Bicycle

8 Chapters

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THE HISTORY OF THE BICYCLE

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The History of the Bicycle

Course 1 · Chapter 1 · Scope and Sources

The bicycle is one of the most successful machines ever made: simple, cheap, efficient and, in its basic form, almost unchanged for well over a century. Its story is also unusually tangled, with rival inventors, national pride and a few famous legends. This first chapter sets out why the bicycle matters, the main kinds of machine the course will meet, how to tell record from legend, and where the evidence can be seen. Dates and names are from general knowledge and flagged for checking.

Why the Bicycle Matters

- **Efficiency.** A person on a bicycle uses less energy to travel a given distance than almost any other means of travel, walking included (check the often-quoted comparisons).
- **Reach.** It gave ordinary people, for the first time, personal transport that needed no horse, no fuel and no licence.
- **Engineering.** Ball bearings, tension-spoked wheels, chain drive, the pneumatic tyre and lightweight tubular frames were developed or popularised for the bicycle, and several passed on to the motor car and the aeroplane (check how direct each link was).
- **Society.** It changed courtship, women's mobility, clothing, road-building and leisure (Chapter 6).

The Main Kinds of Machine

The course follows a rough sequence of designs. Each chapter takes one in turn (dates are approximate, check each):

Hobby horse

1810s. Two wheels in line, steered by a handle, pushed along with the feet. No pedals (Chapter 2).

Boneshaker

1860s. Cranks and pedals fixed to the front wheel, with an iron-rimmed wheel and a rough ride (Chapter 3).

High wheeler

Safety bicycle

1870s to 1880s. A very large front wheel for speed, often called the penny-farthing (Chapter 4).

1880s onward. Two wheels of similar size and a chain to the rear wheel, the layout still used today (Chapter 5).

Record Versus Legend

Few inventions have as many disputed origins. Some of the claims made in books and guides are well documented, and some are repeated without evidence. A careful reader keeps three categories apart:

- **Documented.** Patents, dated newspaper reports, surviving machines and makers' catalogues. Karl von Drais's 1817 machine and its 1818 patent are of this kind (check the dates).
- **Attributed.** Claims made long after the event, often by a family or a town. A well-known example is the story that a Scottish blacksmith built a pedal-driven machine in the 1830s; it is widely told, but the evidence is debated (check, and see Chapter 3).
- **Legendary.** Sketches or stories with no firm provenance. A drawing sometimes said to show a bicycle designed in the 1490s is generally treated by historians as not authentic (check).

> **A working rule**
>
> When a claim of "first" appears, ask what evidence exists, who made the claim, and how long after the event. The word "first" nearly always needs a qualifier: first with pedals, first practical, first mass-produced, first in a given country.

Where to See the Evidence

- **Museums.** The Science Museum in London and national transport museums hold early machines; the Riverside Museum in Glasgow has a transport collection that includes cycles (check what is on display).
- **Patents and catalogues.** Digitised patent records and makers' price lists show how designs and prices changed.
- **Period press.** Nineteenth-century newspapers and cycling journals, many now searchable online, record races, accidents and fashions.

- **Surviving machines.** Private collectors and clubs keep and ride original high wheelers and boneshakers.

A British comparison

Britain is central to this story without being its birthplace: the hobby horse came from Germany, the pedal cycle from France, but the high wheeler and the safety bicycle were largely developed in English towns, above all Coventry, and the pneumatic tyre was worked out in Belfast and Dublin (check). For a reader in Edinburgh, the Scottish claim in Chapter 3 gives the course a local thread.

Check the details

Dates, names and "first" claims in this course are from general knowledge. Verify against a museum, a patent record or a reputable cycling history before quoting any of them.

Exercises

EXERCISE 1

List three reasons the bicycle matters to history beyond being a means of transport.

→ Solution

EXERCISE 2

Explain the difference between a documented, an attributed and a legendary claim, using one example of each from this chapter.

→ Solution

EXERCISE 3

Choose one "first" claim about the bicycle (any you know) and write the questions you would ask before accepting it.

→ Solution

Quick Reference

- **Sequence:** hobby horse, boneshaker, high wheeler, safety bicycle (check dates)
- **Evidence kinds:** documented, attributed, legendary
- **Rule:** qualify every "first"
- **Where to look:** museums, patents, catalogues, period press

The History of the Bicycle

Course 1 · Chapter 2 · Hobby Horses: Running on Two Wheels

The first machine we would recognise as a two-wheeler had no pedals at all. The rider sat astride a wooden beam between two wheels in line and pushed along the ground with both feet. This chapter covers its inventor, the machine, the short-lived craze it started and the reasons it faded. As promised in The History of the Bicycle 1, each claim is flagged for checking.

Karl von Drais

Karl von Drais was a German official and inventor from Baden. In 1817 he is recorded as riding a "running machine" (Laufmaschine) in Mannheim, and in 1818 he received a patent for it (check the dates and the patent's exact status). A famous early ride is said to have covered several miles in under an hour (check the distance and time). One background cause often suggested is the "year without a summer" of 1816, after which many horses died or were underfed, which made a horseless vehicle attractive (check how strong the evidence for this link is).

The Machine

- **Frame.** A wooden frame, with two wheels of roughly equal size set in line (check the wheel size).
- **Steering.** The front wheel pivoted, and the rider steered with a handle. This was the key idea: balance could be kept by steering into a lean.
- **Drive.** None. The rider pushed against the ground with the feet, as in a long, gliding stride.
- **Brake.** At most a simple lever acting on the rear wheel (check), so slopes were descended with the feet down.

> **The real invention**
>
> Earlier ideas for wheeled vehicles worked by being steady on four wheels. Drais's step was to show that a person could balance on two wheels in line, if the front wheel could steer. Everything later in the story builds on that.

The Craze

The machine spread quickly to France and Britain, where it was sold under several names: dandy horse, hobby horse, velocipede (check each name and its use). In Britain, a London coachmaker, Denis Johnson, made and sold an improved version from 1818, with a lowered frame, and the machines were popular with young men of fashion, hence "dandy horse" (check the details). Cartoons of the time mocked riders, and the machines were used in London parks and on smooth roads (check).

Germany

Drais's original, 1817 to 1818 (check).

France

Imitations, sold as draisiennes (check).

Britain

Johnson's pedestrian curricle and the dandy horse (check names).

North America

Some machines were also made and sold there (check).

Why It Faded

- **Roads.** Roads of the time were rutted, muddy or stony, and the hobby horse was most useful on a smooth surface. Riders began using the pavements, which led to complaints and local bans (check).
- **Effort.** Pushing a heavy wooden machine along the ground was tiring, and the machine's advantage over walking was small on anything but a smooth flat.
- **Novelty.** It was a fashion, and fashions pass. By the early 1820s the craze had largely died away (check).
- **Mockery and cost.** The machines were expensive for most people, and the satire did not help.

The idea survived with a few enthusiasts, and it returned in a new form in the 1860s (Chapter 3). A modern echo is the balance bike for small children, which is a hobby horse by another name.

> **A British comparison**

Johnson's machines were sold in London, where the craze was a fashionable one, while the pedal story in The History of the Bicycle 3 begins in France. The Scottish blacksmith story in that chapter is also set in roughly the same decades as the hobby horse craze, which is one reason it is so often told (check).

Check the details

The exact dates of Drais's first ride and patent, the distances of his early trips, the names of the machines and the extent of the "year without a summer" link are all commonly misstated. Verify against a museum or a specialist history.

Exercises

EXERCISE 1

Explain what Drais's machine lacked compared with a modern bicycle, and what it already had.

→ Solution

EXERCISE 2

Describe the "year without a summer" explanation for the invention, and say how cautiously it should be stated.

→ Solution

EXERCISE 3

Give three reasons the first craze faded, and say which you think mattered most.

→ Solution

Quick Reference

- **Inventor:** Karl von Drais, 1817 to 1818 (check)
- **Key idea:** balance on two wheels by steering
- **Drive:** feet on the ground, no pedals
- **British version:** Denis Johnson's dandy horse (check)
- **Decline:** bad roads, effort, fashion (check)

The History of the Bicycle

Course 1 · Chapter 3 · Pedals and Boneshakers

The next big step was to fit cranks and pedals so the rider's feet could leave the ground. Who did this first is one of the most argued questions in cycling history, and this chapter is a good test of the record-versus-legend method from The History of the Bicycle 1. It covers the pedal claims, the 1860s craze in France and Britain, and the harsh machine that earned the name "boneshaker". Names and dates are flagged for checking.

Who Added the Pedals?

Several claims compete (check all of them):

Kirkpatrick Macmillan

A blacksmith from Dumfriesshire, said to have built a rear-driven pedal machine in the 1830s. The evidence is debated (check).

Pierre Michaux

A Paris carriage maker, whose workshop sold pedal-driven machines in the early 1860s (check the date and his own role).

Pierre Lallement

A French mechanic who later emigrated to the United States, and took out a US patent for a pedal velocipede in 1866 (check).

Others

Various claims for earlier or independent pedal machines in several countries (check).

The Scottish Story

The Macmillan story is told widely in Scotland. In it, a blacksmith at Keir in Dumfriesshire made a machine with swinging pedal rods driving the rear wheel, and rode it long distances, once reportedly causing an accident in Glasgow for which he was fined (check all of these details). The difficulty is that the main written accounts date from decades after the 1830s, and no surviving machine is certainly his (check; a replica and a later copy exist). It is therefore best described as an attributed claim, and not as settled fact.

Applying the method

The Michaux claim is better documented, because there are 1860s sales and press reports, but even there the credit has been disputed between Michaux, Lallement and others. A careful sentence says "pedal machines were being sold in Paris by the early 1860s" and leaves the individual credit open.

The Velocipede Craze

By the mid-1860s the Michaux firm was making many machines, and the 1867 Paris exhibition brought them wider attention (check). The craze that followed in France in 1867 to 1869 was far larger than the hobby horse fashion of Hobby Horses (The History of the Bicycle 2). Riding schools opened, races were held, and machines were exported to Britain and America (check). In Britain the word "velocipede" was used, and the first British road races date from about 1868 (check).

The Boneshaker

- **Drive.** Cranks and pedals fixed directly to the front wheel's axle, so one turn of the pedals was one turn of the wheel.
- **Frame.** A heavy iron or wooden backbone, with a saddle on a spring (check).
- **Wheels.** Wooden wheels with iron tyres, which on rough roads gave the nickname "boneshaker" (check the origin of the name).
- **Limits.** Because the pedals turned the wheel directly, the only way to go faster was to enlarge the front wheel, which led straight to the high wheeler (The History of the Bicycle 4).

Why the Craze Faded, Again

The craze cooled by about 1870, for reasons that echo the earlier one: the machines were heavy, tiring and uncomfortable, roads were bad, and the Franco-Prussian War of 1870 to 1871 disrupted French makers (check). But this time the pedal idea was not forgotten, and the next decade improved the design (check).

A British comparison

Coventry, which had a tradition of watch and ribbon making, turned to cycle making after a firm there began copying imported French machines in the late 1860s (check the firm and the date). The city was to become the centre of the British cycle industry, which Chapter 4 follows. In Scotland, Macmillan's story is told in the Dumfries area and in museums, so a visit gives a chance to see the debate at first hand (check what is displayed).

Check the details

Pedal-invention credit is among the most disputed in cycling history. Treat every name and date in this chapter as a claim to verify, and prefer wording that leaves the credit open.

Exercises

EXERCISE 1

Classify the Macmillan and Michaux claims as documented, attributed or legendary, and justify each choice.

→ Solution

EXERCISE 2

Explain why a front-wheel drive led to larger front wheels.

→ Solution

EXERCISE 3

Compare the 1860s craze with the hobby horse craze, listing two similarities and two differences.

→ Solution

Quick Reference

- **Pedal claims:** Macmillan, Michaux, Lallement (check)
- **Craze:** France, about 1867 to 1869 (check)
- **Boneshaker:** pedals on the front wheel, iron tyres
- **Consequence:** bigger front wheels for more speed
- **British hub:** Coventry (check)

The History of the Bicycle

Course 1 · Chapter 4 · The High Wheeler

The logical end of the front-wheel-drive line described in The History of the Bicycle 3 was a machine with a huge front wheel and a tiny rear one. Later called the penny-farthing, it was the first machine to be called a "bicycle" in everyday speech, and the first to support a real industry, a racing scene and organised clubs. This chapter covers the design, the Coventry makers, the sport and the dangers. Names, dates and figures are flagged for checking.

The Design

- **The wheel.** The front wheel was made as large as the rider's leg length allowed, often around 48 to 60 inches across (check the range), so that each turn of the pedals covered a long distance.
- **The frame.** A curved backbone of hollow steel tube, which was light for its strength (check the date this became standard).
- **The wheels.** Solid rubber tyres, and wire spokes under tension, an idea that made large wheels light enough to be practical and which is still used on bicycles today (check who developed the tension-spoke wheel).
- **Bearings.** Ball bearings in the hubs and pedals made the machines run more freely (check).
- **The name.** "Penny-farthing" comes from the contrast between the large penny and the small farthing coins, and seems to have become common only after the machine had passed from use (check). At the time it was an "ordinary" or a "bicycle".

Coventry and the Makers

Coventry became the centre of the British cycle industry, and James Starley (1830 to 1881) is often called the father of it (check). He is credited with developing the tension-spoke wheel and a lever-tension spoke system, and with several early designs, including the Ariel high wheeler of about 1870 (check the details). Other makers followed in Coventry, Birmingham and London (check), and the trade grew into a significant export business. For Scotland, Glasgow and Edinburgh had makers and clubs too (check).

Speed

A skilled rider on a high wheeler could go much faster than on a boneshaker and hold the pace on good roads (check).

Cost

A new machine cost a large part of a skilled worker's yearly pay, so the early riders were mostly middle-class men (check the price).

Skill

Mounting from a step, balancing and dismounting took practice, and a fall was from a great height.

Craze

Riders formed clubs, rode in groups and took up racing (check).

Clubs and Racing

The 1870s and 1880s saw the creation of cycling clubs in Britain, with uniforms, captains and bugle calls, and national bodies to speak for riders. The Bicycle Touring Club (later the Cyclists' Touring Club) was founded in 1878 (check), and long-distance rides, such as Land's End to John o'Groats, became a challenge (check). Track and road racing began, with races of many miles on tracks, and the first national records (check). Cyclists also campaigned for better road surfaces and against restrictions on the road (check).

The dangers

The most common accident was the "header", in which a stopped front wheel or a pothole threw the rider forward over the handlebars from a great height, with serious injury a real risk. The danger was one of the reasons for the next design (The History of the Bicycle 5), though it was a gradual process and some riders kept to the high wheel for racing long after (check).

A British comparison

The high wheeler was almost a British machine, designed, built and ridden in England on a scale not matched elsewhere in the 1870s (check). Today the "Tweed Run" style of event and veteran-cycle rallies keep the image alive, and rallies in Britain regularly bring old machines out on the road (check the events).

Check the details

Starley's inventions, the wheel sizes, prices and the dates of clubs are commonly misstated, and credit in this story is shared between several makers. Verify against a museum or a specialist cycle history.

Exercises

EXERCISE 1

Explain why high wheelers had such a large front wheel and what the design cost in safety.

→ Solution

EXERCISE 2

Name two technical ideas of the high-wheeler era that are still used on bicycles today, and say why they mattered.

→ Solution

EXERCISE 3

Describe who rode high wheelers and why the machines helped create cycling clubs.

→ Solution

Quick Reference

- **Design:** huge front wheel, small rear wheel, tubular frame
- **Key ideas:** tension-spoke wheels, ball bearings (check)
- **Maker:** James Starley, Coventry (check)
- **Riders:** mostly well-off men, in clubs

- **Danger:** the header

The History of the Bicycle

Course 1 · Chapter 5 · The Safety Bicycle

The machine we ride today arrived in the 1880s and was finished off in the early 1890s. It combined three ideas: a chain to the rear wheel, two wheels of similar size, and air-filled tyres. This chapter covers each, the makers behind them and the boom that followed the high wheeler described in The History of the Bicycle 4. Names, dates and details are flagged for checking.

Chain to the Rear Wheel

The key move was to separate the pedals from the wheel. If the pedals drive a chain, and the chain drives the rear wheel through a smaller sprocket, the rider can go as fast as on a huge wheel while sitting low on a small one. Several makers tried this in the 1870s and early 1880s, including H. J. Lawson with his "Bicyclette" (check). The model that settled the design is usually said to be the Rover Safety Bicycle, made in Coventry by John Kemp Starley (nephew of James Starley, Chapter 4) and shown in 1885 (check the date and the name Rover). It had two wheels of nearly equal size, a chain drive to the rear wheel, and a steering head in front of the rider, and it is often called the first commercially successful modern bicycle (check how it is credited).

Gearing

A larger chainring and a smaller rear sprocket gave a high gear without a large wheel.

Position

The rider sat low, between the wheels, with feet able to reach the ground.

Frame

A diamond frame of steel tubes, strong and light, became standard (check the date).

Name

"Safety" because it avoided the header of the high wheeler.

The Pneumatic Tyre

Early safety bicycles still had solid rubber tyres and rode hard. John Boyd Dunlop, a Scottish-born veterinary surgeon living in Belfast, made an air-filled rubber tyre for his son's tricycle and

patented it in 1888 (check the dates and details). Others, including R. W. Thomson earlier, had patented similar ideas, and Dunlop's patent was later challenged (check). Racing success in Ireland in 1889 showed how much faster the tyre was (check), and a company to make them was formed in Dublin (check). Within a few years almost all bicycles used pneumatic tyres, and the idea was soon taken up for the motor car.

Credit and priority

The pneumatic tyre is a good case for the record-versus-legend method of The History of the Bicycle 1. Thomson held a patent in the 1840s, and Dunlop's own patent was in time found to be weak, but Dunlop was the one who made the idea practical and commercial. "First" and "practical" are different things.

The 1890s Boom

- **Price.** Mass production, with standard parts and cheaper steel, brought prices down, and a second-hand market grew (check).
- **Numbers.** The 1890s are often called the golden age or "bicycle craze", with large numbers of makers and riders in Britain, France and the United States (check any figure given).
- **Gears and brakes.** The freewheel, which let the rider stop pedalling while moving, and the coaster brake, together with early hub gears, came in about this time (check).
- **Bubble.** The boom ended in a slump in the late 1890s, when too many firms had been created, and some investors lost money (check).

A British comparison

Dunlop was Scottish by birth, from Ayrshire, and moved to Ireland, so the pneumatic tyre ties Scotland, Ireland and England together in one story (check his birthplace). A Dunlop name still appears on tyres today, though the company has changed hands several times (check).

Check the details

Dates and credit for the chain drive, the Rover, the pneumatic tyre and the gear systems are disputed in places. Verify against a specialist cycle history before quoting.

Exercises

EXERCISE 1

Explain how a chain drive let a small-wheeled bicycle match the speed of a high wheeler.

→ Solution

EXERCISE 2

Describe what the pneumatic tyre changed, and why Dunlop is credited though he was not the first to patent the idea.

→ Solution

EXERCISE 3

Give two reasons the safety bicycle appealed to more people than the high wheeler.

→ Solution

Quick Reference

- **Layout:** equal wheels, chain to rear wheel, diamond frame
- **Model:** Rover safety, Coventry, about 1885 (check)
- **Tyre:** Dunlop, Belfast, 1888 (check)
- **Boom:** 1890s, then a slump (check)

The History of the Bicycle

Course 1 · Chapter 6 · Freedom on Two Wheels

Once the safety bicycle of The History of the Bicycle 5 was cheap and easy to ride, the machine became a social force as well as a technical one. This chapter covers women and cycling, the debate over clothing, the effects on work, leisure and roads, and the way historians weigh large claims about "liberation". Claims are flagged for checking.

Women and the Bicycle

High wheelers were almost entirely a male affair, but the safety bicycle, with its low frame and equal wheels, could be ridden by women, and in the 1890s many did (check the scale). Tricycles had already given some women a way to ride earlier (check). Riding gave women a degree of independence: they could travel without a carriage or a chaperone, visit friends, go to work and go out into the countryside. A frequently quoted remark, attributed to the American suffragist Susan B. Anthony in 1896, says the bicycle had done more to emancipate women than anything else in the world (check the wording and the date). It is a vivid line, but a historian treats it as one voice and not as proof (see the finding below).

Rational Dress

- **The problem.** Long skirts, corsets and petticoats were awkward, and sometimes dangerous, on a bicycle: skirts could catch in the chain or the wheel.
- **Solutions.** Women tried divided skirts, looser clothes, skirts with weights or guards, and bloomers or knickerbockers, which caused debate and sometimes abuse in the street (check).
- **Organisations.** The Rational Dress Society was founded in Britain in 1881 to campaign for sensible clothing (check the date and the group's reach).
- **Reaction.** Newspapers, cartoons and preachers attacked and defended "the new woman" on a bicycle (check).

Weighing a big claim

"The bicycle liberated women" is partly true and partly an overstatement. Cycling widened the lives of many middle-class women, but working-class women often had little money or

leisure to ride, and the vote and wider rights came through political campaigns. A fair sentence says the bicycle helped, among other forces (check how historians put it).

Wider Effects

Work

Workers could live further from the workplace, and messengers, postmen and doctors used bicycles (check).

Leisure

Clubs, Sunday runs and holidays in the country, and cycling as an outing for couples and families (check).

Roads

Cyclists' organisations pressed for better surfaces, and in some countries the "good roads" movement began with them (check).

Population

A wider choice of marriage partners is sometimes said to follow from greater mobility, though this is hard to prove (check).

A British comparison

In Britain, cycling clubs and touring organisations were among the first groups to press for better roads, years before the motor car (check). Edinburgh and the Lothians, with their many quiet roads and railway paths, are still popular with cyclists, and some of those old railway routes are now cycle paths (check which).

Check the details

Quotations, dates of societies and claims of social change are easy to misstate. Verify any quotation at its source before reusing it.

Exercises

EXERCISE 1

Explain two ways the safety bicycle gave women more independence in the 1890s.

→ Solution

EXERCISE 2

Describe the clothing problem and two attempted solutions, and the reaction to them.

→ Solution

EXERCISE 3

Rewrite the claim "the bicycle liberated women" in a way a careful historian would accept.

→ Solution

Quick Reference

- **Women riders:** mainly from the 1890s on the safety bicycle
- **Dress:** divided skirts, bloomers, the Rational Dress Society (check)
- **Quotation:** attributed to Susan B. Anthony, 1896 (check)
- **Wider effects:** work, leisure, roads
- **Method:** weigh big claims

The History of the Bicycle

Course 1 · Chapter 7 · Racing and Engineering

After the basic layout settled in the 1890s (The History of the Bicycle 5), the twentieth century added little to the frame but a great deal to racing, gearing, materials and new types of bike. This chapter covers the great races, the gear systems, the new materials and the new kinds of bicycle that grew out of leisure and youth culture. Names, dates and figures are flagged for checking.

Racing

- **Early road races.** Organised road races date from the 1860s and 1870s, with the long Paris to Rouen race often cited as an early example in 1869 (check).
- **Track racing.** Velodromes (banked tracks) were built in many cities, and track cycling was among the sports of the first modern Olympic Games in 1896 (check).
- **The Tour de France.** First held in 1903, promoted by a sports newspaper to boost its sales (check the paper and the year). It is now a three-week race for professional teams, held each July, and its winner wears the yellow jersey, a colour usually said to come from the paper's yellow pages (check).
- **Other races.** The Giro d'Italia (from 1909) and the Vuelta a España (from 1935) form with the Tour the three "Grand Tours" (check the dates).
- **Britain.** British racing included time trials, which started partly because mass-start road racing was discouraged by the police and by public opinion in the 1890s (check), and later track and road success at the Olympics (check).

Gears, Frames and Materials

Hub gears

Gears enclosed in the rear hub, such as the Sturmey-Archer three-speed, developed in Nottingham in the early 1900s (check).

Derailleurs

Mechanisms that move the chain across sprockets of different sizes, which became standard on racing and sports bikes from the mid-twentieth century (check dates).

Materials

Steel tubes first, then aluminium and titanium, and carbon fibre from the late twentieth century (check).

Brakes and wheels

Rim brakes, then disc brakes; wheels and tyres changed with new rims and tubeless tyres (check).

New Kinds of Bicycle

- **BMX.** Small, tough bikes for dirt-track racing and stunts, which grew from American children's riding in the 1970s and became an Olympic event in 2008 (check).
- **Mountain bikes.** Heavy balloon-tyred bikes were modified in California in the 1970s for riding down fire roads, and developed into purpose-built machines with suspension and wide gears (check who and when, as several people claim a part).
- **Folding bikes.** Designed to be carried on trains and stored indoors, with the Brompton, made in London from the 1970s, a well-known example (check).
- **Cargo and recumbent bikes.** Specialist designs for loads or for a laid-back riding position (check).

Rules shape machines

A recurring theme in racing is that governing bodies set rules on what is allowed, for example on the shape of a bike or on the riding position, so a record can depend on the rules of the time (check the examples). Comparing records across eras needs care.

A British comparison

Scottish riders have a strong record in track cycling, including Olympic medals from Edinburgh and Glasgow, and the Chris Hoy Velodrome in Glasgow and the Meadowbank track in Edinburgh are local landmarks (check the details and the current state of each).

Check the details

Race founding dates, gear inventors and the origin of mountain bikes and BMX are often claimed by more than one person or place. Verify before quoting.

Exercises

EXERCISE 1

Describe how the Tour de France began and why it was started.

→ Solution

EXERCISE 2

Compare hub gears and derailleur gears, and say when each is a better choice.

→ Solution

EXERCISE 3

Explain why the origin of the mountain bike is hard to attribute to one person.

→ Solution

Quick Reference

- **Tour de France:** from 1903, started by a newspaper (check)
- **Grand Tours:** France, Italy, Spain (check)
- **Gears:** hub gears and derailleurs
- **Materials:** steel, aluminium, titanium, carbon fibre
- **New types:** BMX, mountain bikes, folding bikes

The History of the Bicycle

Course 1 · Chapter 8 · Capstone: The Bicycle Today

This last chapter brings the story up to the present: how bicycles are used in cities, what e-bikes have changed, how cycling looks in Scotland and Edinburgh, and what the whole sequence from The History of the Bicycle 1 to The History of the Bicycle 7 teaches about how inventions develop. Figures and policy details are flagged for checking.

Cities and Cycling

- **After the car.** In the middle of the twentieth century, many countries gave priority to motor traffic, and everyday cycling fell sharply in Britain and elsewhere (check the dates and figures).
- **Different paths.** The Netherlands and Denmark kept or rebuilt cycling through separated cycle tracks and traffic rules, while others did not (check the history of the Dutch campaigns of the 1970s).
- **Hire schemes.** Public bike-share schemes, which spread through many cities from the 2000s, make a bike available for short trips (check, as several schemes have changed or closed).
- **Reasons given.** Health, cost, congestion and air quality are the arguments most often made for cycling, and safety and weather the most often given against it (check any statistic).

The Electric Bicycle

A small motor and battery that help the rider when pedalling are the biggest change to the everyday bicycle since the safety bicycle. Electric assist makes hills and long distances easier, widens cycling to older and less fit riders, and has made cargo bikes practical for families and delivery (check). Legal rules differ: in the UK, an electrically assisted pedal cycle that meets set limits on power and assisted speed is treated as an ordinary bicycle (check the current limits). The change raises new questions: about battery safety and recycling, speeds on shared paths, and cost (check).

Commuting

Cargo

Longer trips and arriving less hot and tired.

Children, shopping and deliveries by cargo bike.

Access

Riders with limited fitness or mobility.

Issues

Batteries, theft, speed and cost.

A British comparison

In Edinburgh, cycling is helped by cycle paths on former railway lines and the Union Canal towpath, but is hampered by cobbles, tram lines and hills (check the details). The city council has built segregated lanes and set targets for the share of trips made by bike (check the current targets and results). A good exercise is to compare these with the Dutch approach.

Reading the Whole Story

Lessons from the sequence

- **Inventions are assembled, not struck.** Steering, pedals, the chain, tension wheels and the pneumatic tyre came from different people in different places over about eighty years.
- **"First" needs a qualifier.** Each stage had rival claimants, and the method of The History of the Bicycle 1 (documented, attributed, legendary) applied at every one.
- **Roads and society matter.** Crazes faded when roads were bad, and the bicycle thrived when roads, prices and attitudes allowed it.
- **The layout lasted.** The diamond-frame safety bicycle of the 1880s is still recognisable in the machine on the street, which is unusual for a product of the nineteenth century.

Check the details

Statistics on cycling shares, e-bike rules and local targets change often. Verify against current official sources before quoting them.

Exercises

EXERCISE 1

Explain what e-bikes change about who can cycle and what a bicycle can be used for.

→ Solution

EXERCISE 2

Summarise the sequence of machines in four sentences, naming the key idea added at each stage.

→ Solution

EXERCISE 3

Choose one theme from the course (credit, roads, women, racing or materials) and write a short paragraph on what it shows about how technology and society interact.

→ Solution

Course complete

You have followed the bicycle from the running machine to the electric bike. Keep the habit of qualifying every "first" and checking dates against a reliable source.

Quick Reference

- **Sequence:** steering, pedals, high wheel, chain and air tyre, gears, electric assist

- **E-bikes:** motor assists pedalling, legal limits apply (check)
- **Method:** documented, attributed, legendary
- **Pattern:** inventions are assembled over time