

### Year 3

### History Knowledge Organiser for Inventors and Discoveries

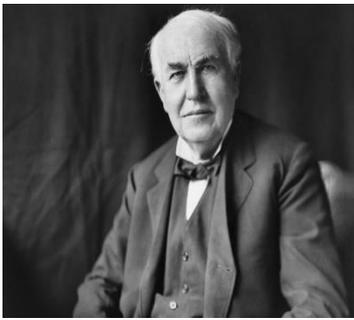
Key Enquiry Questions:	
What are the main inventions and discoveries that have shaped the world we live in?	<ul style="list-style-type: none"> <li>• the wheel, ship building, steam engine, locomotives, petrol motor car, flying machine, jet engine, space travel</li> <li>• cat's eyes, windscreen wipers, pneumatic tyre</li> <li>• printing press, television, telephone</li> <li>• reflecting telescope</li> <li>• electric light bulb, vacuum cleaners</li> <li>• penicillin, x-ray machines</li> <li>• computers and coding</li> <li>• world wide web</li> </ul>
How did new ideas and technological developments contribute to change?	<ul style="list-style-type: none"> <li>• The wheel, ship building, steam engine, locomotives, petrol motor car, flying machine, jet engine, space travel all changing transport and travel making it quicker and easier.</li> <li>• Cat's eyes, windscreen wipers, pneumatic tyre developments in increasing safety when travelling.</li> <li>• Printing press enabling mass publication of the printed word to be communicated through documents, books and newspapers.</li> <li>• Reflecting telescope allowing a greater understanding of the universe and gravity.</li> <li>• Electric light bulb, vacuum cleaners – developments to improve the way of life.</li> <li>• Telephone - contact between people.</li> <li>• Television – pictures and images could be communicated to everyone.</li> <li>• Penicillin, X-ray machines creating new ways to cure diseases and diagnose treatments.</li> <li>• Computers and coding – increasing the efficiency of information storage and communication.</li> <li>• World wide web – interactivity and communication across the world.</li> </ul>
Who were the main inventors and what was their significance?	<ul style="list-style-type: none"> <li>• Johannes Gutenberg, Thomas Edison, Karl Benz, The Wright Brothers, Marie Curie, Mary Anderson, Robert Goddard, Grace Hopper</li> <li>• Sir Isaac Newton, James Watt, George Stephenson. Charles Babbage, Isambard Kingdom Brunel, Alexander Graham Bell, John Boyd Dunlop, Hubert Cecil Booth, John Logie Baird, Alexander Fleming, Percy Shaw, Frank Whittle, Sir Tim Berners-Lee ( All British )</li> <li>• Advancements in technology and medicine making communication, travel, daily life more accessible to everyone and increasing life expectancy through cures and diagnosis.</li> </ul>
How have these inventions developed overtime?	<ul style="list-style-type: none"> <li>• Travel and transport have become more sophisticated reaching further destinations in quicker times.</li> <li>• Communication has developed significantly becoming more mobile and easily accessible to everyone enabling audio and visual interaction across continents bringing people closer together.</li> <li>• Healthcare around the world has invested in new medicines, techniques and research providing better treatments and cures prolonging life.</li> </ul>

Key Vocabulary	
<b>analytical engine</b>	Mechanical general-purpose computer.
<b>antibiotic</b>	A medicine (such as penicillin) that can prevent the growth of bacteria that can cause diseases.
<b>blueprint</b>	A design plan or drawing.
<b>cat's eye</b>	A reflective glass in the middle of the road showing you where to drive.
<b>colliery</b>	A coal mine and the buildings connected with it.
<b>combustion</b>	The process of burning something.
<b>computer coding</b>	A method of intercommunication between humans and machines.
<b>computer scientist</b>	Someone who designs software (programs or instructions) for computers to make them do lots of interesting things.
<b>discovery</b>	Finding something that is new or unknown.
<b>engineer</b>	A person who designs and builds engines, machines and structures.
<b>force</b>	The power or strength something has.
<b>fuel</b>	A material such as gas, coal or oil that is burned to produce heat or power.
<b>gravity</b>	The force that attracts an object towards the centre of the earth.
<b>iron hulled</b>	The main body of the ship made from the metal iron.
<b>industrial revolution</b>	The rapid development of industry that occurred in Britain in the late 18th and 19th centuries, brought about by the introduction of machinery. It was characterised by the use of steam power, the growth of factories, and the mass production of manufactured goods.
<b>innovation</b>	A new or original method, idea or product.
<b>innovative</b>	An original idea that shows creative thinking.
<b>internet</b>	A global computer network that provides a variety of information and communication.
<b>inventor</b>	A person who creates something that is new.
<b>invention</b>	A new creation.

<b>locomotive</b>	The powered carriage of a railway engine.
<b>miner</b>	A person who works underground digging for minerals such as coal.
<b>mould</b>	A soft, green or grey growth that develops on food or objects that have been left too long.
<b>newtons</b>	The unit used to measure forces.
<b>orbit</b>	The circular path around an object.
<b>patent</b>	A patent gives an inventor the right to stop other people making or using their invention.
<b>penicillin</b>	Belongs to a group of medical drugs called antibiotics. These medicines fight infections caused by small living things called bacteria.
<b>pneumatic</b>	Contains or operates by air or gas under pressure.
<b>power plant</b>	A factory/building with machinery for supplying power for a particular mechanical process or operation.
<b>printing press</b>	A machine that uses ink to transfer words and images to paper.
<b>propellor</b>	A device that causes a ship or aircraft to move, consisting of two or more blades that spin at high speed.
<b>radical</b>	Revolutionary, supporting change.
<b>radiation</b>	The transfer of energy through waves or fast travelling particles. It can be in the form of heat, sound and light.
<b>radium</b>	A chemical element.
<b>radioactive</b>	When atoms in objects lose particles and emit high-energy <b>radiation</b> .
<b>reflecting telescope</b>	Causes an image to reflect at a focus point by using mirrors giving a clearer picture.
<b>steam engine</b>	An engine which uses steam from boiling water to make it move.
<b>telescope</b>	An instrument that allows people to see distant objects.
<b>telephone</b>	An electrical system of communication that you use to talk directly to someone else in a different place.
<b>television</b>	A machine with a screen. Televisions receive broadcast signals and turn them into pictures and sound. The word " <b>television</b> " comes from the words tele (Greek for far away) and vision.
<b>transatlantic</b>	Crossing the Atlantic Ocean, or relating to countries on both sides of the Atlantic Ocean.
<b>transmission</b>	A programme or signal that is sent out.
<b>turbojet</b>	A jet engine in which a fan driven by a <b>turbine</b> provides extra air to the burner and gives extra <b>thrust</b> .
<b>vacuum cleaner</b>	A piece of electrical equipment that sucks dirt from floors and other surfaces.
<b>x-ray</b>	Waves of electromagnetic radiation that can pass through many opaque materials.
<b>x-ray machine</b>	They can be used to take photographs of the inside of the body. An x-ray machine sends invisible x-ray particles through the body. The images produced are recorded on a computer or on film.

<b>Key Facts:</b>	
<b>3500 BC the wheel</b>	Mesopotamia (modern day Iraq) discovered it made moving trees and rocks much easier when building their settlements. Some would argue this is mankind's most important invention ever. It has been used to discover other great inventions from clocks to vehicles.
<b>1450 printing press</b>	<b>Johannes Gutenberg</b> invented the printing press. In the 19th century iron materials replaced wooden materials. The industrial revolution would not have been possible if it wasn't for the speed with which the printing press allowed documents, books and newspapers to be sent all over Europe. The bible was one of these documents allowing people to start questioning and reasoning by reading for themselves.
<b>1668 reflecting telescope</b>	<b>Isaac Newton</b> The 'Newtonian' telescope - used mirrors to reflect light, simpler and was less expensive than previous models. <b>Newton</b> discovered that Earth must have a force which pulls things down instead of letting things float upwards. We call this force <b>gravity</b> . Newton discovered that gravity attracts all objects towards each other. The bigger an object, the more gravity it would have. He developed this theory to work out that gravity kept the moon in orbit around Earth.
<b>1814 steam engine</b>	<b>James Watt</b> designed the blueprint to create the mechanism where combustion of fuel releases a high-temperature gas to put pressure on the piston to move it. This invention played a pivotal role in invention of other machinery such as automobiles and aeroplanes.
<b>1825 passenger railway</b>	While working as a miner, <b>George Stephenson</b> established an aptitude as a mechanic and was allowed to build machines at his colliery. At the time, carts pulled by horses were used to take coal to the ship yards. Stephenson used steam engines to replace horse power and this led to a series of world firsts – including the passenger railway.
<b>1837 computer analytical engine</b>	Invented by <b>Charles Babbage</b> with the principal of the modern computer being mentioned by Alan Turing. This invention has helped military aircrafts to fly, put a spaceship into orbit, control medical equipment, create visual imagery, store vast amounts of information and allowed the functioning of cars, phones and power plants.
<b>1843 SS Great Britain first iron hulled</b>	<b>Isambard Kingdom Brunel</b> was a famous engineer and inventor who transformed the way that Victorian people travelled. Isambard built the Great Western Railway connecting London to the rest of the country. He created steamships that travelled faster than sailing ships – The 'Great Western',

<b>ship</b>	launched in 1837, was the first steamship to engage in transatlantic service. The 'Great Britain', launched in 1843, was the world's first iron-hulled, screw propeller-driven, steam-powered passenger liner and he built the world's largest ship called the SS Great Eastern but this was not commercially successful. He also built many tunnels and bridges that are still used today.
<b>1876 electric light bulb</b>	<b>Thomas Edison</b> is attributed as the primary inventor of a bulb that lasted for 1500 hours without burning out. This idea was taken forward by many others to create a workable and bright light bulb.
<b>1876 telephone</b>	<b>Alexander Graham Bell</b> was a Scottish scientist, engineer and inventor. He spent years trying to invent a way of sending the human voice over electrical wires. In 1847, he began working with the electrician <b>Thomas Watson</b> . On 10th March 1876, Alexander made the first ever telephone call to Thomas. The Bell Telephone Company was set up in 1877 and by 1886 over 150,000 people had a telephone in their home!
<b>1885 petrol motor car</b>	<b>Karl Benz</b> developed a three-wheeled vehicle with two seats designed in Germany. The company became known as Mercedes Benz.
<b>1887 pneumatic tyre</b>	<b>John Boyd Dunlop</b> – In 1845, railway engineer <b>Robert William Thomson</b> patented the world's first pneumatic tyres but there was no real market for them. Forty years later, <b>Dunlop</b> came up with pneumatic tyres to stop his son getting headaches from riding his bumpy tricycle. This time around, the invention handily coincided with the new bicycle craze
<b>1901 vacuum cleaner</b>	<b>Hubert Cecil Booth</b> was watching a railway carriage being cleaned by a machine that blew the dust away when he had the idea for a machine that sucked the dust up instead. To test his theory, he placed a handkerchief on a chair and sucked through it, finding that dust collected on either side. He set up a cleaning service using hoses from vans on the street going through the windows of buildings.
<b>1902 discovery of radium and radioactivity</b>	<b>Marie Curie</b> named the term RADIOACTIVE to describe the strange nature of the new element radium, which when exposed to cancerous cells, it destroyed them quicker than healthy cells. She continued to investigate all forms of radiation and radioactivity, including X-rays which had been discovered in 1895 by <b>Wilhelm Roentgen</b> . She developed the use of X-rays for medical purposes and created X-ray machines which were used in WW1 for injured soldiers.
<b>1903 aeroplane</b>	<b>Orville and Wilbur Wright</b> invented the aeroplane; this was a huge milestone in the world of international transportation. They learned how to make efficient propellers and studied how birds flew to aid their wing designs. They also learned how to make lightweight engines.
<b>1905 windscreen wipers</b>	<b>Mary Anderson</b> invented windscreen wipers. On a rainy journey to New York, she noticed other drivers having to open their windows and look out in order to see where they were going. She invented a swinging arm with a rubber blade that could be operated by the driver from inside the vehicle to solve the problem. Amazingly, car manufacturers initially didn't see the value in her invention, and it wasn't until 1922 that Cadillac became the first car manufacturer to include windscreen wipers on all its vehicles.
<b>1925 television</b>	<b>John Logie Baird</b> was highly credited for being the first to make a moving image on television in grayscale. In 1928, he showed the world's first colour television transmission.
<b>1926 rocket liquid fuel</b>	<b>Robert H Goddard</b> was the first to develop a rocket motor using liquid fuels (liquid oxygen and Gasoline). The world's first flight of a liquid-propelled rocket engine took place on his Aunt Effie's farm in Auburn, Massachusetts, achieving a brief lift-off.
<b>1928 penicillin</b>	<b>Alexander Fleming</b> accidentally discovered penicillin when mould grew on another experiment he was carrying out. Penicillin is one of the famous discoveries made in the field of medicine.
<b>1933 cat's eye</b>	<b>Percy Shaw</b> was a Yorkshire road contractor who devised the cat's eye in 1933. He claimed that his inspiration came when he was driving home from the pub on a foggy night and saw the reflection of his headlights in the eyes of a cat, sitting by the road. Shaw's cat's eye was voted the greatest invention of the 20 <sup>th</sup> century.
<b>1937 jet engine</b>	<b>Frank Whittle</b> first patented a new kind of aircraft – the turbojet – in 1930, but his new design was so radical that the military wouldn't fund it, nor would any manufacturers. Then in 1937 he found a few private backers and in 1941 a 17-minute test flight took place at RAF Cranwell in Lincolnshire.
<b>1944 computer coding language</b>	<b>Grace Murray Hopper</b> invented a language that computers could use. It is called COBOL and was one of the earliest computer programming languages.
<b>1989 World Wide Web (WWW)</b>	<b>Sir Tim Berners-Lee</b> was a British engineer who invented web sites found through the internet. Tim wanted to find a way that the scientists could share their experiments with each other. He used the Internet and a special computer language called hypertext to make a way for people at the lab to be able to put information on the Internet. He called it 'ENQUIRE'. This was a first version of the world wide web. A few years later, Sir Tim worked on a form of ENQUIRE that anyone around the world could use. Tim called this the World Wide Web.



**Thomas Edison** also invented the microphone, phonograph and kinoscope. The phonograph was an early record player, Edison recorded himself saying the nursery rhyme 'Mary Had a Little Lamb' and was amazed when his invention played it back to him. The kinoscope was an early movie camera. The purpose of Edison's invention was to create an absolute audiovisual system that would allow you to see and hear a work as if you were on the spot. This interesting machine has been considered the first cinema projection machine.

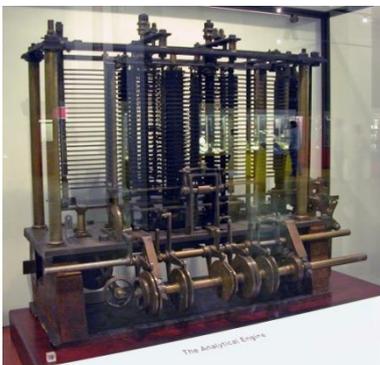


**Alexander Graham Bell** invented the telephone. Some people think he invented the word "hello" in order to answer the phone!

Bell had to continue defending his idea from other scientists who claimed they had thought of it first. Over eighteen years, the Bell Telephone Company faced over 550 patent challenges. None were successful and Alexander Graham Bell is still regarded as the inventor of the first successful telephone.



**Marie Curie** Between 1898 and 1902, The Curies worked on X-rays and uranium when they discovered a new element that seemed to give off a light naturally, they called it RADIUM. They discovered that when it was exposed to cancerous cells, it destroyed them quicker than healthy cells. Marie named the term RADIOACTIVE to describe the strange nature of RADIUM. They also discovered another new element and named it POLONIUM. She won the Nobel Prize in 1903 for physics and again in 1911 for chemistry. Today the Charity Marie Curie Cancer Care is proud to be named in honour of her.



Analytical Engine - **Charles Babbage**.



**Sir Isaac Newton** also discovered something known as the three laws of motion: The **first law** - something that is still will remain still, unless a force is applied to it. The **second law** - acceleration (speeding up) happens when a force is applied to an object. The heavier the object, the more force will be needed to accelerate the object. The **third law** - For every action, there is an equal and opposite reaction.

Newton also carried out experiments about light. Using a dark room and a prism, he was the first to discover that light is made up of different colours.