Knowledge Organiser: Knowledge Organiser: Modern Medicine (c1900-Present)

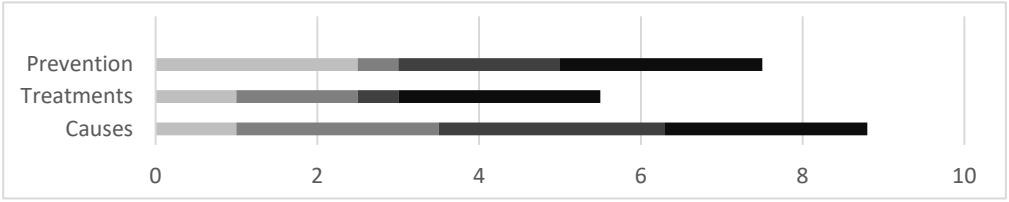
Scientists began to investigate causes of disease that were not related to microbes. Genetics and lifestyle factors were investigated as other potential factors. Chemical treatments were developed to target specific diseases, while antibiotics were discovered that could treat a range of illnesses. Advances in surgical techniques made available life-saving treatments. The government also developed a new attitude towards its role in the nation's health. Free medical care was provided for all through the NHS. However, diseases such as cancer continue to puzzle scientists, who struggle to understand their cause or develop treatments for them. Lifestyle factors have also created new challenges for medicine to tackle.

Summarise your learning	
Causes	• Pasteur's Germ Theory • Genetics (DNA)
Diagnosis	• Electron Microscopes – to view tiny details inside the body, e.g. early infections • Radioactive elements – injected into the bloodstream to track changes in the body • Endoscopes – tiny cameras inserted into the body • Scans: - X-rays for broken bones - CT scans for soft tissue problems like head injuries
Prevention	• NHS – GP, hospitals, health visitors • Vaccinations • Lifestyle campaigns • Laws – e.g. no smoking in public places
Treatments	• Magic bullets • Penicillin • Keyhole and Micro-surgery – surgeons can operate without cutting open a patient which improves recovery time

Chronology: what happened on these dates?	
1909	Paul Ehrlich discovered the first magic bullet, Salvarsan 606.
1928	Alexander Fleming discovered penicillin.
1942	First immunisation campaign against Diphtheria started.
1948	The creation of the National Health Service (NHS).
1954	Watson and Crick discovered the double helix structure of DNA.
1990	The Human Genome Project was launched to decode and map the human genome. This made it possible for scientists to look for mistakes or mismatches in the DNA of people suffering with hereditary diseases.

Who were these people?	
Paul Ehrlich	Ehrlich led the way in finding magic bullets to attack the microbes in the body causing disease, whilst at the same time leaving the body unharmed. In 1909 he discovered the first magic bullet, Salvarsan 606, which cured syphilis. This was followed by Domagk's discovery of Prontosil in 1932.
Alexander Fleming	In 1928, Fleming noticed that mould growing in his petri dishes killed off the harmful staphylococcus bacteria that had been growing in the dish. He tested the mould and identified it as penicillin. However, Fleming did not believe that penicillin could work to kill bacteria in living people.
Howard Florey & Ernst Chain	In 1940, Florey and Chain tested penicillin on infected mice (4/8 were given penicillin and survived). However, it was difficult to produce penicillin in large quantities. In 1941, Florey and Chain tested penicillin on a policeman who had developed septicaemia. The policeman showed signs of recovery but they ran out of penicillin and the patient died. Florey convinced the USA to mass produce penicillin.
James Watson & Francis Crick	Crick and Watson identified the structure of DNA. They discovered that it was shaped as a double helix, which could 'unzip' itself to make copies. Understanding the shape of DNA meant that they could now begin to look at its structure and identify the parts that caused hereditary diseases, such as cystic fibrosis and Down's syndrome.

Change and Continuity	
Change	**Continuity**
• Infections – this is now radically reduced, but many are becoming resistant to antibiotics (MRSA) • Link between genetics and disease • CT scans, radiotherapy and chemotherapy (lung cancer) • Government intervention • Creation of the NHS	• Pasteur and Koch's work with germs led the way for the work on magic bullets and antibiotics • X-rays were discovered by Rontgen in 1895 (not used until C20th) • Jenner's initial work on vaccines led to the understanding that a vaccine could eradicate a disease



Vocabulary: define these words	
Hereditary	Diseases caused by genetic factors. This means that they can be passed on from parents to their children.
DNA	Carries the genetic information from one living thing to another. DNA information determines characteristics like hair and eye colour.
Biopsy	An examination of tissue removed from a living body to discover the presence, cause, or extent of a disease.
MRI Scan	Uses powerful magnets, radio waves, and a computer to make detailed pictures inside your body.
Genome	The complete set of DNA containing all the information needed to build a particular organism.
Haemophilia	A hereditary genetic disease that stops blood clotting.
Mastectomy	Surgery during which a person has one or both breasts removed.
Antibodies	Particles inside the body that identify and help to remove germs.
Antibiotic	A medicine that inhibits the growth of or destroys microorganisms
Compound	A mixture of two or more different elements.
MRSA	A strain of drug-resistant bacteria that is particularly resistant to antibiotics.
Laparoscopic	Keyhole surgery using tiny cameras and narrow surgical instruments, allowing for more precise surgery with smaller cuts.
Radiotherapy	The treatment of disease, especially cancer, using X-rays or similar forms of radiation.
Chemotherapy	The treatment of disease by the use of chemical substances, especially the treatment of cancer.
Legislation	A law or set of laws that have been passed by Parliament.