

## Robert Koch

Please complete all tasks in this worksheet which goes alongside the slides that you will be working from today. As you work through the slides you will need to complete the tasks.

**Task 1:** Complete this quick quiz to recap your knowledge of previous time periods we have covered in the medicine topic.

<u>Question</u>	<u>Answer</u>
<b>1) Who was Louis Pasteur?</b>	Louis Pasteur was a French chemist that discovered germ theory and published his findings 1861.
<b>2) Which new theory about the causes of disease came about in the early 1700s?</b>	Spontaneous generation - The theory that decaying materials would produce microbes that caused disease. It was closely linked to the popular, but outdated theory of miasma.
<b>3) What did Pasteur theorise following the process that is now known as pasteurisation?</b>	Pasteur theorised that there were microbes in the air that caused substances to decay and go off. He proved this after he conducted the swan neck flask experiment. Germ theory disproved the theory of spontaneous generation.
<b>4) Where did Pasteur face opposition?</b>	Pasteur faced opposition as he was criticised heavily for: <ul style="list-style-type: none"><li>- Not being a doctor</li><li>- Not having proof that microbes were the cause of disease</li><li>- Not supporting the theory of spontaneous generation.</li><li>- Even the British government refused to believe his theories.</li></ul>
<b>5) Which powerful influence on medicine in Britain criticised Pasteur?</b>	Dr Henry Bastian - he criticised Pasteur's theories up until his death. Bastian was a firm supporter of spontaneous generation, closely linked to the popular theory of miasma.

**Task 2:** You will need to have the set of google slides open titled 'Robert Koch'. Please read through slide 3 and answer the following questions. You must answer these in full sentences.

- 1) Who was Robert Koch?

**Robert Koch was a German physician and microbiologist considered to be the founder of modern bacteriology.**

- 2) What did Robert Koch do?

**Koch was interested in Pasteur's theory, so he investigated anthrax, he discovered that bacterium was what caused it. His experiments lent support to the concept of infectious disease.**

**Task 3:** You should now read through slide 4 and answer the following questions. You must answer these in full sentences.

- 3) What did the work Koch did achieve for Louis Pasteur?

**The work that Koch did confirmed Pasteur's germ theory, in turn disproving spontaneous generation**

- 4) For what diseases did Robert Koch identify the microorganisms that caused them?

**Robert Koch identified the microorganisms that were responsible for septicaemia, TB and cholera.**

- 5) What animals did Robert Koch use for his experiments?

**Koch experimented on mice and developed a method for proving which particular bacteria was causing particular diseases.**

**Task 4:** You should now read through slide 5. Now in full sentences, write down how Koch conducted his experiment step by step and what it proved.

**Koch set up a series of experiments to prove that a particular microorganism caused the disease. Firstly, Koch extracted bacterium from a sheep that had died of anthrax. Then, he cultured the bacterium. After doing this, he injected the culture into the mice, which then developed the disease. This process was repeated over 20 generations of mice before he announced his findings in 1876. Koch's findings proved that specific bacterium were responsible for causing specific diseases and illness.**

**Task 5:** You should now read through slide 6 and 7 and answer the following questions. You must answer these in full sentences.

- 6) What did Koch's assistant, Julius Petri develop which made observation easier?

**Koch's assistant, Julius Petri, developed the Petri dish which made observations of bacteria easier.**

- 7) Why was staining bacteria important for Koch's experiments?

**Staining bacteria was important for Koch's experiment because it improved the bacteria's visibility under a microscope. This was important for when new high-quality photographic lenses were developed, as photographing bacteria helped identify the culprits of tuberculosis in 1882 and cholera in 1883.**

8) Why was Robert Koch's breakthrough so important? Why was it influential in Britain?

**Koch's breakthrough in the diagnosis of diseases was important because he proved to the profession that the microbe created symptoms of disease, therefore proving Pasteur's theory correct and the theory of spontaneous generation wrong. This was influential in Britain as Pasteur's Germ Theory only really took off in Britain following the years of work by Koch, Lister and Pasteur himself. The proof of successful vaccinations using these men's ideas was enough.**

**Task 6: Using all of the information you have learned over the past lessons, who do you think was more influential in the fight against disease, Louis Pasteur or Robert Koch? Give reasons to back up your answer.**

**I think that Robert Koch was more influential in the fight against disease, because it was his enormous breakthroughs in the diagnosis of disease that proved Pasteur's germ theory correct. Koch's breakthrough in the diagnosis of diseases was important because he proved to the profession that the microbe created symptoms of disease, therefore proving Pasteur's theory right and proving the theory of spontaneous generation, which had come out in the early 1700s, wrong. This was influential, as Pasteur's Germ Theory only really took off in Britain following the years of work and experiments by Koch. Using mice, he identified the microorganisms that were responsible for septicaemia, TB and cholera. His experiments lent support to the concept of infectious disease. Koch's methods of staining bacterium was important because it improved the bacteria's visibility under a microscope. This meant that when new high-quality photographic lenses were developed these bacteria could be easily photographed. These methods of photographing bacteria helped identify the culprits of tuberculosis in 1882 and cholera in 1883. Robert Koch did more for the fight against disease and made it easier for other scientists to develop his ways. Without Koch's results, there would have been no change in Britain because Pasteur's theory had not explained how microbes made people ill or which microbes caused specific illnesses. This made it more difficult for people to accept Pasteur's ideas, especially when the British Government refused to believe it. Therefore, I believe that Robert Koch was more influential in the fight against disease because without his evidence of bacteria, no change would have come about.**

**This is a fantastic extended answer Evie! You have demonstrated clearly why you think that Robert Koch was more influential**