# DUE on your day of enrollment

Please bring your completed project with you and hand it to your teacher.

Antibiotic resistance is emerging as a major issue in human and animal healthcare. The development of antibiotics made an enormous difference to our ability to treat and control infectious disease caused by bacteria. Quite apart from the ability to cure people of infections like tuberculosis and diphtheria, they also make it possible for people to benefit from cancer treatments and surgery such as hip transplants when they are particularly susceptible to infection by bacteria which would not cause a problem in other circumstances.

Resistance to antibiotics was anticipated by the scientists who discovered the first antibiotics. Alexander Fleming noted in his Nobel Prize acceptance speech, “Then there is the danger that the ignorant man may easily under-dose himself and by exposing his microbes to non-lethal quantities of the drug make them resistant.”

We now know that the development of resistance is an inexorable process, as inevitable as the process of evolution itself.

Here, we will look at how antibiotics were developed, how resistance emerges, and what we can do about it.

YOUR TASK:

Take your time to work through the following three activities. You must then use your newly acquired knowledge to answer the three questions for each activity.

[Activity 1](Activity%201.pdf)

[Activity 2](Activity%202.pdf)

[Activity 3](Activity%203.pdf)

[Activity 4](Activity%204.pdf)

Activity 1

1. How did the treatment of infection develop throughout the First World War?
2. How were the majority of antibiotics discovered? Why were they discovered rather than invented?
3. Give a brief overview of three antibiotics that were not first discovered in nature.

Activity 2

1. What is binary fission?
2. Give a brief explanation of how antibiotic resistance genes may be transferred into bacterial cells.
3. How does antibiotic resistance spread within populations of bacteria?

Activity 3

1. How have the actions of humans led to antibiotic resistance?
2. Outline the advantages and disadvantages of using antibiotics in farming.
3. How can we reduce the spread or impact of antibiotic resistance?

Activity 4

1. Why has the development of new antibiotics slowed?
2. Outline some potential alternative methods of treating bacterial infections.
3. Have your say! Do you think we should change the way that we deal with bacterial infections or should we just keep developing antibiotics?