

## Microbe sex/Antibiotic action

### Introduction

In this activity students, working in small groups, will make a movie showing microbe reproduction or antibiotic action. Although many students will have been taught about this topic, being able to make their own models helps understanding and recall of the information.

### Resources

They will need access to digital cameras and computers, possibly with microphones.

Modelling materials required: this will vary depending on what you have available but could include: Modelling clay, pipe cleaners, straws, and string.

### The activity

You may want to give them the information so that they don't have to do any research, or you may ask them to use sources, such as textbooks, to find out the information required for the activity.

You may want to split the students so that initially half study bacteria and half study viruses, and then extend this so that they all research and produce a movie on antibiotics. (You will need to alter the scenario for the students in that case).

Once students have the information they need they will then make models to show the process and take regular photographs of it. By uploading these photos into a package such as Photostory (available from Microsoft as a free download), moviemaker or even PowerPoint, they will be able to produce a movie explaining the process they have researched.

Timing for this activity is fairly flexible, but would probably fit well into two 1 hour slots. If you want students to research their own information you will need to allow extra time for this. The storyboarding, making of models and photography will take about 1 hour. Further time may be needed to complete the movie, which could take place in the second hour. Also in the second session, students could show their movies to each other. You can introduce peer-assessment at this point, asking students to provide brief feedback to each other on the clarity, scientific accuracy and artistic quality of their movies.

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### References

Specification 3.1.2

### Science Explanations

**Aa** Many diseases (of humans, other animals and plants) are caused by small organisms (microbes) such as bacteria, fungi and viruses which are present in the environment and can be passed on from already infected individuals.

**Ab** Bacteria or fungi may enter the body and reproduce in certain organs or tissues. Viruses are not independent organisms but are packets of genetic information which cannot survive on their own but can invade healthy cells and make them produce copies of the virus, usually killing the cell in the process. The symptoms of a disease are caused by damage to the tissues, by the toxins produced by the microbes or sometimes by the immune system itself.

**Af** Antibiotics are chemicals which kill or inhibit the growth of certain bacteria or fungi. They can be used to treat infections by these organisms. They have no effect on viruses. However, over a period of time the bacteria or fungi become resistant to an antibiotic. Random mutations in the genes sometimes lead to individuals which are less affected by the antibiotics. These have a better chance of surviving a course of antibiotic treatment. These resistant individuals then reproduce, resulting in resistant strains of microbes.



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### Introduction

The purpose of this activity is to help you understand and remember microbe reproduction, by explaining it to others in an attractive and interesting way.

### The activity

Imagine you are a film director. You have been asked to make a short film, suitable for GCSE students, explaining one of the following:

- How bacteria reproduce.
- How viruses reproduce.
- How antibiotics work, and how bacteria become antibiotic resistance.

The film must be scientifically accurate – no smiley faces on the microbes! It should also have either a voiceover or subtitles explaining what is happening.

Where to start?

1. Before you even begin to make your models you need to research your topic. For example:
  1. What science do you need to know?
  2. What do the microbes look like?
  3. What is an antibiotic and how does it work?
  4. What is antibiotic resistance?
2. Now you need to 'storyboard' your film. What do you want your film to look like? How will you get the information you know across to your viewers?
  - Perhaps the easiest way to storyboard your movie is to split a piece of A4 paper into 4 or 8 boxes, and draw/write in each box what will be seen in the movie. The storyboard is a graphic organiser which will help you visualise your movie before you make it.
  - At this stage you might also want to write the script for the voiceover which will accompany the movie.
3. Now you can begin building your models. Ensure that they are scientifically accurate.
  - They can be flat or 3D, it's up to you. Flat models have the advantage that it's easier to 'see inside' to show what is going on inside e.g. a body cell.
  - You can either make one model, and alter that as you go along, or make a series of models.
4. Once you are happy with your models start photographing them. You will probably need a lot of photographs if you want to show changes clearly.
5. To make the movie itself you can use PhotoStory (or moviemaker) from Microsoft. This will allow you to order the photos, apply titles/subtitles with animation, record a voice-over and a soundtrack for your movie.