**Information for Leader**

The workshop is based on the book ‘Fight Against Resistance’. The book is a ‘pathfinder’; the reader needs to make decisions at key points in the plot. The activities described here are based on these decision points. This book is targeted at Key Stage 2 pupils (aged 7-11), to help them learn about the correct use of antibiotics.

The book and these activities have been developed with the following in mind:

National Curriculum links for KS 2

English: Reading and comprehension, Writing.

Science: Living things and their habitats, Animals, including humans.

PHSE: Health education

Art & Design: creativity

DfE Statutory Guidance Categories: Physical Health and Mental Wellbeing (Primary)

By the end of primary school, pupils should know about personal hygiene and germs including bacteria, viruses, how they are spread and treated, and the importance of hand washing.

NICE guideline:

Antimicrobial stewardship: changing risk-related behaviours in the general population

NICE guideline [NG63] Published: 25 January 2017

1.4.6 Teach all children, in an appropriate way for their age and ability, about the need to reduce inappropriate antimicrobial demand and use.

Learning Outcomes.

By the end of this workshop, participants should:

1. Be aware of the basic differences between viruses and bacteria.
2. Know that viral infections cannot be treated with antibiotics.
3. Understand the importance of not sharing antibiotics.
4. Understand the importance of finishing the course of antibiotics.

Resources

* Virus worksheet (1 per participant)
* Bacteria worksheet (1 per participant)
* Video cards – there are three different cards, each participant receives one card, distributed at random. There are three videos to be screened.
* Casefile #1 - *Streptococcus* (pronounced strep-toe-coc-us) (1 per group)
* Casefile #2 – Rhinovirus (pronounced rhino-virus) (1 per group)
* Patient Casefile (1 per group)
* Antibiotic fact-file (1 per group)
* Character pictures, DOC’s speech on antibiotics

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| Decision Point | Resource |
| Decision Point 1 | Virus worksheet, parts 1 and 2 of bacteria worksheet  Case file #1 and #2, Patient casefile |
| Decision Point 2 | Part 3 of bacterial worksheet, antibiotic fact-file |
| Decision Point 3 | Video cards and videos |

**Introduction** *Resources needed: images of Max, Georgie, DOC, DOC’s speech.*

All the activity is seen through the eyes of the reader, who is referred to as ‘Newbie’.

Newbie has been selected to join the Anti-Bio Squad; a team of young people who help to fight infectious diseases with antibiotics. When the squad are given a new case, their first task is decide what is causing the infection as not all infections need antibiotics. The second task is to decide which antibiotics to use.

The squad are based on an island that floats in the sky known as The Lab. Newbie joins a group of squad members who are returning to base and meets Max and Georgie, who are team leaders.

Max and Georgie take Newbie into The Lab to meet DOC, the boss. DOC has a new mission for them; a young boy with a throat infection. DOC has decided that Newbie can go with Max and Georgie to investigate. Before they go, DOC explains the rules to Newbie

1. Some infections are caused by viruses – these must not be treated with antibiotics as they won’t have any effect. Antibiotics are only to be used on bacterial infections.
2. The squad is divided into teams and each one uses a different antibiotic. It is one team (one antibiotic) per mission. Antibiotics should not be shared between teams. Max is the Penicillin team leader, while Georgie is in charge of a different antibiotic called Ciprofloxacin.
3. If antibiotics are needed, the dosage is calculated, and it must all be delivered. If the whole course of treatment is not completed, then the bacteria may become resistant to the antibiotic, and it stops being effective.

**Decision point 1**: Has the sore throat been caused by a bacteria or a virus? (30min)

*Resources needed: virus and bacteria construction sheets, Casefile #1, and #2, Patient casefile.*

To help us decide, let’s start by finding out some of the differences between viruses and bacteria.

The virus: cut out the virus net and assemble into the diamond shape. Cut out the RNA spiral and ‘stuff’ it into the virus net.

The bacteria: cut out the bacteria and the 3 organelle cards (parts 1 and 2 on the sheet). Put the antibiotic to one side for now.

Encourage discussion on the differences between the two:

* Virus: very simple – just the 1 long string of nucleic acid, that tucks inside the capsule.
* Bacteria: bacteria are more complicated, and have several items (organelles) to tuck inside.

These differences are why antibiotics work on bacteria but not on viruses. The antibiotics can stop the organelles working properly, and kill the bacteria. Viruses don’t have organelles, so there is nothing for the antibiotics to act on.

(As this is a long activity, DOC’s speech from the book could be read here while the children are cutting out the shapes)

The most likely culprits for the sore throat are either the Rhinoviruses, or the *Streptococcus* bacteria. Use the fact files to help you decide.

Take a vote on whether the sore throat is viral or bacterial (use list of symptoms to encourage vote for *Streptococcus*!)

Which treatment option will you use? (This should be penicillin to treat *Streptococcus*).

(Back to the book). It has been decided that the sore throat has been caused by *Streptococcus* bacteria which can be treated with penicillin. Back at base, Max and Newbie are getting ready for the fight. Georgie has been called away to another case that needs treatment with ciprofloxacin. She calls Newbie; it’s a really bad case, the patient is only 5 and Georgie needs supplies. Will Newbie send her some of the penicillin?

**Decision point 2**: Should we share antibiotics? (15 min)

*Resources: Part 3 (the antibiotic part) of the bacteria sheet*, Antibiotics fact-file.

* Create an antibiotic – follow the instructions on the sheet about patterns and colours, and how to stick the antibiotic to the bacteria.
* Try swapping your antibiotic with the person sitting next to you – will it match? If not, why not?

Encourage discussion about different targets on different bacteria, and the lack of targets on the viruses.

Take a vote on whether Newbie should share their antibiotics with Georgie (hopefully they will vote no!) Stress the importance of not sharing antibiotics.

(Back to the book) Max and Newbie go to fight the bacteria with the penicillin. There is a fierce battle with the Anti-Bio squad firing their antibiotics into the bacteria, and the bacteria throwing mucus back at the squad. After the fight appears to be over, Newbie discovers that not all the tablets have been used – there are ‘spare’ antibiotics. Should these antibiotics be used up or taken back to base?

**Decision point 3**: Are these leftover antibiotics? What should we do with them? (10 – 15 min)

*Resources: cards and videos*

* Cards are distributed at random, outlining one of three scenarios.

1. All the antibiotics are taken
2. Only some of the antibiotics are taken
3. None of the antibiotics are taken.

Watch the videos to see what happens in each scenario.

Take a vote: should the antibiotics be taken back to base (no) or used up? (yes).

Hooray! Everybody voted to use up the antibiotics, and the infection has been defeated!

Additional activities that can be worked on after the workshops

* Using the music from the videos, write a song to help us to remember what to do.
* Write a poem to help you remember the rules of using antibiotics.
* Write and perform a short play based around the decisions points
* Create a storyboard or drawings of the events covered in the workshop.