KEY STAGE 4 - LESSON 7

Infection Prevention and Control (IPC):

Vaccinations

This lesson includes a detailed presentation and animations showing how the body fights harmful microbes daily. Students will take part in an in-depth discussion about vaccinations, including busting some common vaccine misconceptions.

Curriculum Links

Science

- Scientific thinking
- Experimental skills and strategies
- Analysis and evaluation

Biology

- Cells
- Health and disease

PSHE/RSHE

- Health and prevention

English

- Reading
- Writing

Art & design

- Graphic communication

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e-bug.eu/eng/KS4/lesson/Vaccinations

Learning Outcomes

All students will:

- Understand that vaccinations help individuals to develop immunity against an infection(s) and help to fight off the infection(s).
- Understand why vaccines are important to students now and throughout their life.
- Understand the important diseases prevented by vaccines, and why these are important to young people, including students.

Most students will:

- Understand how the media, and epidemics, can affect vaccine uptake positively and negatively.

Resources Required

Main Activity: Immunity and Vaccinations Worksheet

Per class

- [ ] Animation e-bug.eu/eng/KS4/lesson/vaccinations
- [ ] Copy of TS1 and TS2

Per student

- [ ] Copy of SW1

Extension Activity 1: Student Debate kit

Per class

- [ ] Vaccinations Debate Kit Resources – I'm a Scientist Debate Kits freely available from: debate.imascientist.org.uk/the-kits/#vaccinations

Extension Activity 2: Vaccine Misconceptions

Per class

- [ ] Copy of PP1
- [ ] Copy of HPV Fact Sheet freely available from| www.gov.uk/government/publications/hpv-vaccine-vaccination-guide-leaflet
- [ ] Copy of TS3

Per Student

- [ ] Copy of SW2

Advance Preparation

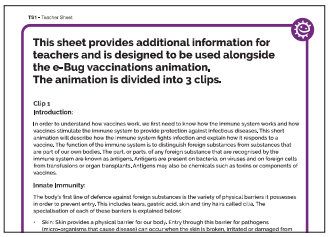
1. Copy SW1 and SW2 for each student.
2. Download the interactive vaccination misconceptions slides and prepare animations by accessing the e-Bug website e-bug.eu/eng/KS4/ lesson/ vaccinations.
3. In advance for the lesson, you can ask students to complete their own personalised vaccination timeline, available on the e-Bug website. This timeline will detail all the vaccinations students should have had; they can discuss this at home with their parents. Immunisations that students have (not) had are personal and should not be discussed as a class.

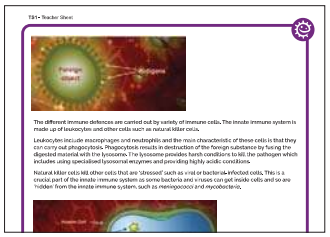
   Students may be very surprised at the number of immunisations that have been available to them in their lifetime.

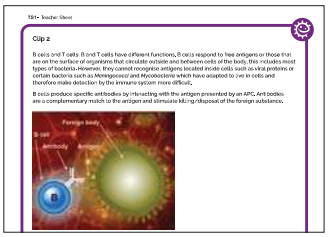
Key Words

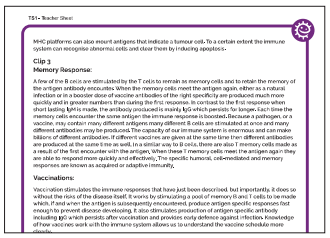
Antibody, Antigen, COVID-19, HPV, Immune system, Immunity, Vaccines

Supporting Materials

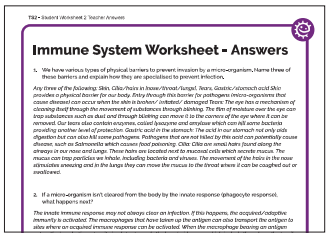


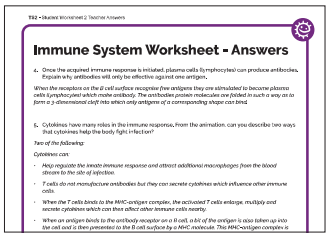


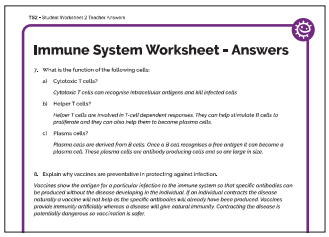




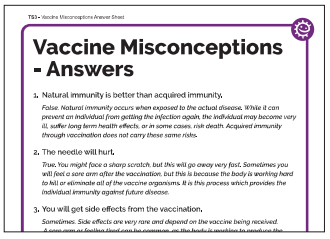
TS1 Teacher Sheets Animation Clip Answers



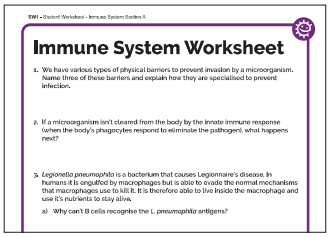


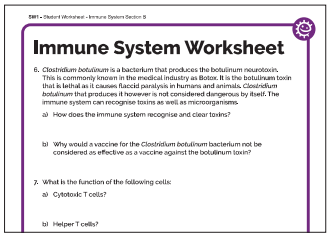


TS2 Immune System Worksheet Teacher Answers

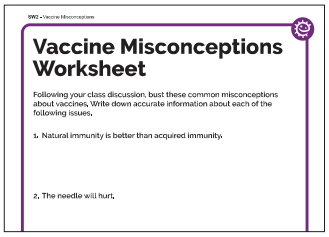


TS3 Vaccine Misconceptions Worksheet

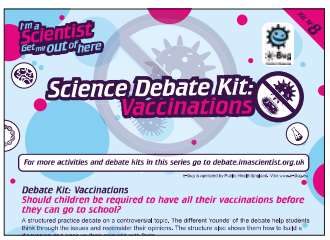




SW1 Immune System worksheet



SW2 Vaccine misconceptions



SH1 I'm a Scientist Debate Kit (available from debate.imascientist.org.uk/the-kits/#vaccinations)

Lesson Plan

Introduction

1. Provide an introduction for students, describing that they are going to learn about vaccinations, and why they are so important. Students will be learning facts, will discuss some common misconceptions, and the influence of others when making decisions about vaccinations. Students will learn if and how the media influence vaccine uptake, subsequent disease rates and herd immunity.

2. Ask students what they already know about vaccinations. Questions to be discussed could include:

   a. Do you know what a vaccination is?

   b. How does a vaccination work?

   c. What vaccinations do children usually have, and at what ages?

   d. What vaccinations have you had?

   e. Why do you think you need vaccinations against diseases such as the flu, measles, mumps and rubella (MMR) or COVID-19?

   f. Do students know what herd immunity is? Ask students to describe this in their own words. (The herd immunity animation on e-bug.eu/eng/KS4/lesson/Vaccinations website could be used if students are still confused about herd immunity).

3. Be prepared that some students may question the safety of vaccines. The teacher refresher section at the beginning of the pack may help you answer any questions that arise.

Extension Activity: Immunity and Vaccination Debate

1 Break into a maximum of 8 groups. Your teacher will assign each group a character card.

2 Choose one person from your group to read aloud the character's opinions to the rest of the class

3 As a class, discuss the opinions of each of the characters

4 Now, choose a person from your group to read aloud the fact on the character cards

5 Discuss as a class. Have your views changed?

Main Activity:
Immunity and Vaccinations Worksheet

1. Ask students to watch the immunisation animation clips available through the e-Bug website. The animations are divided into three clips and cover immunity and vaccinations. Guidance to complement the animation clips can be found in TS1.

2. **Provide each student with a copy of SW1. Students should answer the questions based on the information provided in the animation. Answers can be found in TS2.**

Extension Activity:
Vaccination Debate Kit

1. Developed in collaboration with 'I'm a Scientist', the vaccine debate kit facilitates a structured practice debate about a controversial topic. Download the vaccination debate kit, freely available from debate.imascientist.org.uk/the-kits/#vaccinations.

2. There are eight character cards. Divide the class into a maximum of eight groups, or as many characters as you wish to cover. Assign each group a character.

3. Work through each round of the debates as instructed and encourage students to consider their opinions. The structure demonstrates to students how to build a discussion and reinforce their opinions with facts. Teacher notes are included in the kit to help carry out the lesson effectively.

Discussion

Discuss the common vaccination questions with the class

Q: What is vaccination?

A: Vaccinations are another means of helping our immune system protect us against harmful diseases. They use your body's natural defences to build resistance to specific infections and help build our immune system stronger.

Q: Why should I get vaccinated?

A: Vaccines have saved millions of lives. Without vaccines, we are at serious risk of illness and disability from diseases like measles and meningitis. Vaccinations protect ourselves from illness and others from getting ill too. Not everyone can be vaccinated, sometimes very young babies, very old people and people with serious illness e.g. a weakened immune system caused by disease or treatment– these people depend on others getting vaccinated to prevent the spread of infection and protect them.

Q: Why is vaccination important?

A: Vaccines are a safe and effective way in preventing us from getting ill. Today there are vaccines to protect us from at least 20 diseases including tetanus, influenza, measles, mumps, polio and meningitis. When getting vaccinated, we aren't just protecting ourselves but also the people around us. Vaccines help prevent the spread of infection.

Q: How does a vaccine work?

When the vaccine is injected into the body the immune system attacks it as if harmful microbes were attacking the body. White blood cells, a part of our immune system, create lots of antibodies to attach to specific markers on the surface of the vaccine organisms. These markers are called antigens. It takes our immune system around two weeks to learn about the vaccine organisms and while this is happening, we might feel a little tired or develop a sore arm. This is because the immune system is working hard to kill or eliminate all of the vaccine organisms. Because the vaccine is either a killed or extremely weakened version of the microbes, our immune system can process the vaccine and it will not make you ill. By successfully eliminating all the vaccine, the immune system remembers how to combat those microbes. The next time microbes carrying the same markers/antigen enter the body the immune system is ready to fight it before it has a chance to make you ill. This means you develop immunity against diseases.

Extension Activity

Vaccine Misconceptions

Present the interactive vaccination slides from e-bug.eu/eng/KS4/lesson/vaccinations. The slides address five vaccine misconceptions that young people may experience, and provides answers based on student views.

Involve the students in answering yes or no to each point and then review the background information provided.

Students should then complete SW2. Answers to the worksheet are included in the MS PowerPoint PP1.

A fact sheet providing the facts and misconceptions of the HPV Vaccine can be found www.gov.uk/government/publications/hpv-vaccine-vaccinationguide-leaflet

Learning Consolidation

Ask students to consolidate their knowledge of all vaccines and produce a public information infographic. This can be used to help students to practice disseminating useful information whilst engaging with their local community.