**Viruses and Vaccinations – Lesson Plan**

**Approximate timing:** 60 minutes

**Required resources:** Presentation, Virus Fighter game link, computers (for students to try out the Virus Fighter game)

**Link to game:** <https://virusfighter.org>

**Curriculum Links:** Sections on infectious diseases, for example:

AQA GCSE Biology: 4.3.1 Communicable diseases

OCR GCSE Gateway Science Biology A: B6.3 Monitoring and maintaining health

**Learning Outcomes:**

All will be able to: Describe how a vaccine works.

Most will be able to: Define antigen, antibody and pathogen.

Some will be able to: Use named examples and describe what properties have the biggest impacts on controlling disease.

**Slide descriptions:**

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| 1 | Title slide |  |
| 2 | Structure of the lesson, introducing students to what will be covered |  |
| 3 | Learning objectives |  |
| 4 | Ask students for their participation in raising their hand if they’ve had a vaccine | Most if not all should raise their hand |
| 5 | Ask students to contribute writing on the whiteboard what vaccine they had | Hopefully should have lots of different examples |
| 6 | Some history about vaccines – video link | Opportunity to ask students if they know how vaccines were discovered before playing the video |
| 7 | Simulation on measles using Virus Fighter (select measles in free play mode, don’t change any properties except vaccination rate to 50% and run for 30 days) | Opportunity to ask the class how they think the simulation might look before running |
| 8 | Ask students what they noticed from the simulation |  |
| 9 | Point out all the different elements of the simulation including how many died, how many were sick and the spread on the graph. Can also highlight the costs at the bottom of the simulation |  |
| 10 | 3 Keywords with definition for students to read or for you to read aloud |  |
| 11 | Pathogens video | Can ask students after the video or at the end of the lesson ‘what are pathogens?’ ‘What do they do?’ |
| 12 | Antigen diagram and description to read |  |
| 13 | Antibody diagram and description to read |  |
| 14 | Three ways in which a vaccine is made |  |
| 15 | Vaccine video | Can ask students after the video or at the end of the lesson ‘What is a vaccine?’ ‘what does it do?’  Encourage the use of key words and terms from previous slide to reinforce definitions |
| 16 | Herd immunity diagram- highlighting its importance and the reasons why such as protecting those more vulnerable and to help towards eradicating the disease |  |
| 17 | Ask students for their predictions on what would happen in the simulator if 75% were vaccinated.  Run the simulation for measles, changing the property of vaccinated proportion of the population to 75% for 30 days. | You will probably find the infection dies out before the 30 days are up. |
| 18 | Ask students to comment on the result of the simulation and what they thought stood out most |  |
| 19 | Compare the two outcomes of the simulator looking at human cost and economic costs to both and the significant difference vaccines have made | Hopefully students will notice fewer deaths and fewer total infections with the high level of vaccination. This demonstrates herd immunity |
| 20 | Ask the students to play with the simulator making predictions before running and commenting on the results after | This will require students to have access to a PC |
| 21 | Homework task to further understanding and a way to test knowledge | (Optional) |