Vaccinations activity (15 mins)

Curriculum Links (KS3):

Science: Working scientifically; Experimental skills and investigations, Analysis and evaluation

PSHE: Core theme 1 - Health and wellbeing; Core theme 3: Living in the wider world

Geography: Human and physical geography, Geographical skills and fieldwork

Learning Objectives:

All students will:

- understand that vaccines help prevent a range of bacterial and viral infections.
- understand that there are not vaccines for all infections.

Most students will:

- understand that previously common infections are now rare due to vaccines.
- understand that the most common infections such as the common cold or sore throat are not prevented by vaccines.
- understand that vaccines are dead or weakened microbes.

Some students will:

- understand that declining vaccination rates mean that rare infections could become more common again in some places.

Risk Assessment:

In the event of an outbreak of infection you may need to modify this activity to ensure social distancing or other criteria according to your school's policy. Please email the e-Bug team at e-Bug@phe.gov.uk if you wish to discuss ideas or modifications to this activity that are needed to follow guidelines in your setting.

This activity is suitable for school and community groups and can be found in the "3.2 Prevention of Infections: Vaccinations" section of the KS3 senior pack. This activity will help participants to understand what vaccines are and how they can help prevent the spread of infection to others and contribute to immunity.

Use the introduction in the KS3 lesson plan to discuss:

- Which vaccines/ immunisations participants have had, e.g. polio, MMR, tuberculosis, or any holiday vaccinations, and if they know what the vaccines were for.
- Explain that immune means that you are protected from the serious effects of infection and that 'immunisation' is a way of increasing the body's protective immunity to both bacterial and viral diseases.
- Explain that vaccines are a small and harmless amount of the microbe/disease which teaches our body how to fight the bad microbe when or if we get attacked by the disease.
- Explain how vaccines work with the help of section "3.1 Prevention of Infection: The Body's Natural Defences". Explain that antibodies pass from mother to child through the placenta in the womb, and breast milk after birth, helping to protect newborn babies from disease.
- Remind students that each type of microbe has an outer coating which is unique to the microbe, but because some microbes change their outer coats so quickly it is difficult for scientists to make vaccines for these infections, or like the flu vaccine, a new one must be made each year.

Before you begin you will need:

- Background and lesson plans for "3.2 Prevention of Infections: Vaccinations" section of the KS3 senior pack.
- Student handouts 1 to 5
- Student worksheet 2
- Teacher answer sheets for scenarios 1 and 2 in the "3.2 Prevention of Infections: Vaccinations" section of the KS3 senior pack.

Click here to access the resources for KS3 school, and community groups

Use the following steps as a guide to implement this activity:

1. This activity is best completed with the entire group. Explain to the group that they are going to simulate how vaccinations stop people getting ill.
2. Provide everyone in the group with a red (infected), white (immune), blue (recovering but still infectious) and yellow (vaccinated) card (**SH 1** – **SH 5**).

Scenario 1 (Demonstration of the spread of infection and immunity)

1. Select a person in the middle of the group and ask them to hold up their red card. Explain that they are now infected by a disease. Ask them to touch one person in their vicinity. This person is now infected and they must hold up a red card. This marks the end of day one. *We say the end of day 1 because it takes that long for the infection to incubate and for the first symptoms of the infection to manifest themselves.*
2. After a few seconds tell the class it is now day 2. Participant 1 should now be holding a blue card i.e. s/he is recovering but still infectious. Participant 2 should now be holding a red card. Ask each of these students to touch someone different in their vicinity. These two people are now infected and they must hold up a red card. This marks the end of day two.
3. After a few seconds tell the class it is now day 3.
    a. Participant 1 should now be holding a white card i.e. s/he is now immune
    This person is a normal healthy individual with a healthy immune system therefore they were able to fight off the disease and develop immunity.
    b. Participant 2 should now be holding a blue card, i.e. s/he is recovering but still infectious
    c. Participants 3 and 4 should be holding red cards i.e. they are now infected
4. Continue steps 1 – 3 for up to 7 days and ask participants to complete the Scenario 1 section of their worksheets.

Scenario 2 (Demonstration of the spread of infection and immunity through vaccination)

1. Ensure that each participant has a set of cards (as for scenario 1). Explain to the group that in this scenario they are going to observe what happens during vaccination programmes. The process will be the same only this time some of the group will be vaccinated (immune).

2. Explain that you are going to give each of them a piece of paper that will either say 'vaccinated' or 'susceptible'. They must not show their paper to anyone else and must not hold up their vaccinated card unless touched by an infected person.

   a. 25% vaccinated: 75% susceptible
   Give **25%** of the participants the paper with the word vaccinated and the rest of the group the paper with the word susceptible. Repeat steps 1–4 in Scenario 1, however, when a vaccinated person is exposed to the infection they will hold up their yellow card (vaccinated) and will not transmit the infection onto anyone else.

   b. 50% vaccinated: 50% susceptible
   As above, however, give **50%** of the participants the paper with the word vaccinated and the rest of the group the paper with the word susceptible.

   c. 75% vaccinated: 25% susceptible
   As above, however, give **75%** of the participants the paper with the word vaccinated and the rest of the class the paper with the word susceptible.

   Students will observe a downward trend in infection as more people get vaccinated. It may be beneficial at this point to explain the term 'herd immunity'. Herd Immunity is a type of immunity which occurs when the vaccination of a portion of a population (or herd) provides protection to unvaccinated individuals.

Use the plenary or discussion questions to check participant's understanding after the activity is completed.

A lesson plan for KS4 / 5 on Vaccinations is also available here with alternative activities.