Assignment Discovery Online Curriculum

Lesson title:
Common Vaccinations

Grade level:
6

Subject area:
Science

Duration:
Two class periods

Objectives:
Students will do the following:

- Understand how vaccines work
- Create class posters describing different types of vaccines

Materials:
- Internet access
- Poster board (five pieces, one for each group), markers, colored pencils

Procedures:
1. Ask students what they know about vaccines. What is a vaccine? What are some common vaccines you know of or have received? Why are vaccines important? Write their answers on the board.

2. Review the basics of vaccines and how they work with the class:

    - Explain that the immune system is the body's method of protecting itself from foreign substances that invade the body. Vaccines work with our immune system to protect against measles, mumps, polio, and other diseases. A vaccine helps your body create antibodies, or cells that fight off antigens, and foreign substances like bacteria or viruses. Sometimes your body creates antibodies by itself, but not enough to fight a serious disease like polio.

    - A vaccine is made from the antigen—either a bacteria or a virus—that causes the disease. Some vaccines use live but weakened versions of the antigen. Some are made from “killed” antigens, and others are made from parts of the antigen or one that closely resembles the targeted bacteria or virus. In any form, a vaccine does not contain enough of antigens to cause the disease. It has just enough to trigger the body's immune system to produce antibodies against that disease. In most cases, these antibodies remain active and protective against

the disease for a person's lifetime. This protection is called immunity. In some cases, a vaccine requires booster shots, doses given at regular intervals.

3. Explain that usually, children receive several vaccinations during the first 10 years of their lives, most of them before the age of one. Write the following vaccines on the board:

- Polio
- MMR (measles, mumps, rubella)
- DTP (diphtheria, tetanus, pertussis)
- Hepatitis B
- Varicella (chicken pox)

4. Divide the class into five groups and assign each group one of the vaccinations above. Tell students that each group will create a poster to educate the public about a vaccine. Their poster should answer as many of the following questions as possible:

- What disease is this vaccine meant to prevent?
- Describe the disease this vaccine prevents: What are the symptoms? Who is most susceptible? Is the disease caused by a virus or bacteria?
- Who should be vaccinated? Who should not be vaccinated?
- How does the vaccine work? How often should a person be vaccinated?
- What are some possible side effects of the vaccine?
- What are some other interesting facts about this vaccine?

Provide the following Web sites to help students research different vaccines:

All About Vaccines
<http://www.fda.gov/oc/opacom/kids/html/vaccines.htm>

Guide to Childhood Immunization
<http://www.cdc.gov/nip/publications/Parents-Guide/default.htm>

Vaccines: What You Need to Know
<http://www.babycenter.com/vaccine>

Vaccines
<http://www.parentsplace.com/health/archive/0,10693,239302,00.html>

Disease Chart
<http://www.cdc.gov/nip/diseases/disease-chart-public.htm>

Vaccines Chart
<http://www.cdc.gov/nip/vaccine/vac-chart-public.htm>

Guide to Childhood Immunization
<http://www.cdc.gov/nip/publications/Parents-Guide/default.htm>

5. Ask students to consider the audience of their poster (for example, parents, pregnant women, teenagers). Once they decide whom they are addressing, encourage them to use appropriate language and images. In addition, ask students to think about the most effective locations for their posters, such as a pediatrician's office or a bus stop.

6. Have each group present its poster, while giving a brief explanation of the vaccination studied. Then ask students to hang posters around the room. As a class, discuss the importance of vaccinations.

7. If your class is interested in the potential risks of vaccinations, encourage them to do further research on this topic. What are some problems associated with vaccines? What are the recommendations for countering these risks? Hold a class debate about whether certain vaccinations should be mandatory. The following Web sites should be helpful:

Vaccine Safety
<http://www.vaccines.net/ >

CDC: Overview of Vaccine Safety
<http://www.cdc.gov/nip/vacsafe/>

Discussion Questions:

1. Why is it important to vaccinate against rare diseases?
2. Considering what you learned about vaccinations, why do you think most are given during the first year of life?
3. Do you think there will be new vaccinations required during your lifetime? Explain your answer.

Evaluation:

Use the following three-point rubric to evaluate how well students conducted their research, created their posters, presented their displays, and participated in class discussions.

Three points: strong research skills; developed creative and innovative ways to present information; gave a detailed, interesting report to the class; and participated actively in class discussions.

Two points: on-grade-level research skills; developed competent ways to present information; gave a satisfactory report to the class; and was somewhat engaged in class discussions.

One point: weak research skills; did not complete the display; gave a brief report with some errors to the class; and was not engaged in class discussions.

Extensions:

Ask students what they know about smallpox. Explain that smallpox was once the world's most feared disease. Caused by a virus that spread quickly from person to person, it killed millions. Widespread vaccination eventually wiped out the disease. Have students use the Web sites below to research the history of smallpox, including early epidemics, the first successful vaccination, and concerns today with smallpox.

Edward Jenner and the Discovery of Vaccination
<http://www.sc.edu/library/spcoll/nathist/jenner.html>

Squint's English Corner: Edward Jenner
<http://www.slam.katowice.pl/~zez/lis97/squint.html>

The First Recorded Smallpox Vaccination
<http://www.thedorsetpage.com/history/smallpox/smallpox.htm>

Suggested Reading:

Allergies
Alvin Silverstein, Virginia Silverstein, and Laura Silverstein Nunn. Franklin Watts (A Division of Grolier Publishing), 1999.
Do you sneeze around cats? Get a rash from eating strawberries? You may have an allergy. Learn all about allergies in this lively book: what causes them, what goes on in your body when you have an allergic reaction, and how allergies can be treated. Lots of photographs, cartoon drawings, and highlighted words and text help make this a fine introduction to the subject.

Your Body's Heroes and Villains: Microexplorers
Norbert Landa and Patrick Baeuerle. Barron's, 1997.
Imagine being small enough to travel through your body and watch how it handles the germs and viruses that make you sick! Lots of pictures show what happens when tiny germs called microbes invade your cells and how your cells fight them. A short quiz at the end of the book reviews the points covered—and there is a short glossary.

Vocabulary

antibody
Definition: A substance that fights a disease by protecting the body from a virus or bacteria.
Context: Vaccines cause the body to develop **antibodies** to fight a disease.

antigen
Definition: A substance such as bacteria or a virus that invades the body and stimulates the production of an antibody.

Context: Recognized as a threat by the immune system, an **antigen**, such as the streptococcus bacteria, triggers the production of an antibody.

bacteria
Definition: Simple one-celled organisms classified as prokaryotes.
Context: Although many **bacteria** live in the human body without causing harm, some cause tuberculosis, typhoid fever, whooping cough, and other diseases.

immunization
Definition: The process of protecting the body against disease using vaccines or serums.
Context: Most children complete their **immunization** schedule before they begin school.

vaccine
Definition: A substance that protects a body against a disease by causing the body's immune system to produce antibodies.
Context: Some **vaccines** provide lifelong protection against infection, while others require several doses given at regular intervals.

virus
Definition: A microscopic organism that lives in a cell of another living thing.
Context: **Viruses** are a major cause of disease and can infect human beings with measles, influenza, and the common cold.

Academic Standards:
This lesson adheres to the National Science Education Standards for students in grades 5-8:

- Life Science
- Science in Personal and Social Perspectives

Credit:
Joy Brewster, writer and editor of educational materials for K-12 teachers and students.