GERMS – THE SMALLEST ENEMY

Contagious diseases are illnesses you can catch from someone else. These diseases are caused by germs. Germs are tiny one celled living organisms that enter your body and cause many illnesses that can make you sick. Germs are so small, you can't even see them without a microscope!

THREE TYPES OF GERMS

VIRUSES are the tiniest of the three main types of germs. A virus is contagious. A virus lives by getting inside a cell in your body. A virus forces a cell to make hundreds of copies of the virus. Eventually, all the copies rush out of the cell and invade other cells. The measles, colds, and the flu, are a few diseases caused by viruses. Scientists believe that viruses may even cause certain kinds of cancers.

One problem with viruses is that they are not killed by antibiotics or other medicines. A doctor cannot give you an antibiotic to make a bad cold go away faster. You will just have to get through it. **Antibiotics DO NOT work against viruses.**

PROTOZOANS cause other diseases. Protozoans are single-celled organisms. Look at a drop of pond water through a microscope. You will most likely see protozoans swimming around in it. Most protozoans are harmless, but diseases such as, malaria, African sleeping sickness, and dysentery are caused by protozoans. One type of protozoan is the amoeba. Protozoans are larger than bacteria.

BACTERIA are another kind of germ. Bacteria are not contagious. Bacteria are germs picked up from unclean things. Bacteria cause diseases, such as strep throat, tetanus, and tuberculosis. Some bacteria can be killed by antibiotics. Fortunately, **antibiotics DO work against bacteria**, so many serious diseases that were once very serious, are now curable.

Believe it or not, not all bacteria are harmful. Not all bacteria cause diseases. Some bacteria are actually helpful! In nature, bacteria are necessary to break down dead plants and animals. Actually, one kind of bacteria lives in the intestines and helps the body create certain vitamins.

Viruses, bacteria, and protozoans are all around us. One reason we aren't sick all the time is that the body can build immunity to diseases it has caught before, and the body can create defenses against germs.

One way to build immunity to a disease is to catch it. A better way to build immunity to a disease is to get an **immunization** or a **vaccination**.

An immunization or a vaccination is when a doctor injects a small amount of dead or weakened germs into the body. The body then creates the exact same defenses it would create if you had gotten the actual disease. Usually, an immunization does not make you sick. However, some immunizations can sometimes cause bad side effects.

Most immunizations are given to people when they are babies. These immunizations protect babies and children from many serious diseases.

SMALLPOX is a deadly disease. It once killed thousands of people every year. Today, smallpox may be totally gone from the world. This is due mostly to the work of Dr. Edward Jenner, an English doctor.

An epidemic of smallpox broke out when Jenner was a young doctor. An epidemic is when many people catch a certain disease.

Even though Jenner worked hard to save his patients, many of them still died. He observed that the milkmaids who milked the cows on dairy farms, did not catch smallpox.

He talked to several milkmaids, and he discovered that the women sometimes caught cowpox, a disease caught from cows. Cowpox was similar to smallpox. It caused spots like smallpox, but the spots were only on the women's hands. Cowpox was not a deadly disease, and no one ever died of cowpox. Remarkably, the women who had gotten cowpox never seemed to catch smallpox!

Jenner guessed, or hypothesized, that people who had gotten cowpox were somehow protected against smallpox for the rest of their lives!

Jenner conducted an experiment. He tested his hypothesis by deliberately injecting cowpox germs into people. After these people recovered from cowpox, he saw that none of them got smallpox!

At first, many people were against Jenner's experiment. They were afraid to catch any disease. Some people believed that Jenner was going "against nature.". Some people accused him of practicing witchcraft!

Over time, it became clear that people's lives were being saved. As more people became vaccinated, Jenner became famous.

Jenner's idea of deliberately injecting people with a mild disease to protect them from a serious disease was the foundation of all our modern day vaccinations.

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1. Diseases can be caused by problems inside your body or by _____ invading from outside of your body.
   ① vaccinations
   ② germs
   ③ antibiotics
   ④ people
   ⑤ children

2. Three types of germs are _____, _____, and _____.
   ① disease, protozoans, and bacteria
   ② viruses, vaccinations, and bacteria
   ③ viruses, bacteria, and protozoans
   ④ viruses, disease, and protozoans
   ⑤ viruses, bacteria, and immunity

3. Your body builds up some protection, called _____, to diseases it has fought before.
   ① hypothesis
   ② germs
   ③ protect
   ④ immunity
   ⑤ bacteria

4. A shot that causes your body to build immunity is called an immunization or a _____.
   ① germ
   ② disease
   ③ hypothesis
   ④ disease
   ⑤ vaccination

5. Most of these shots should first be given to people when they are _____.
   ① immune
   ② protected
   ③ children
   ④ vaccinated
   ⑤ immunized

6. Children should get all their shots to _____ them against many serious diseases.
   ① protect
   ② cure
   ③ schedule
   ④ weaken
   ⑤ terminate

7. Which of these statements best summarizes **all** the functions of bacteria?
   ① Bacteria both help and harm us.
   ② Bacteria make us sick.
   ③ Bacteria are never useful.
   ④ Bacteria help us make vitamins.
   ⑤ Bacteria cannot be killed by antibiotics.

8. _____ _____ is a terrible disease that once killed thousands of people.
   ① cow pox
   ② lung cancer
   ③ blood poisoning
   ④ small pox
   ⑤ chicken pox

9. An educated guess is called _____ _____.
   ① an opinion
   ② a hypothesis
   ③ a prediction
   ④ a command
   ⑤ a virus

10. Jenner's hypothesis was that getting a small amount of a disease would make a person _____ _____ that disease.
    ① prohibited from
    ② entitled to
    ③ part of
    ④ immune to
    ⑤ appeal to

11. Jenner's idea of giving someone a mild disease deliberately, or _____ _____, to protect him from a serious disease was the beginning of our modern vaccinations.
    ① in schools
    ② later on
    ③ on purpose
    ④ on time
    ⑤ at work