How Vaccines Work

By Brandi Waters

[1] Imagine that one day you were captured by aliens and dropped off on a strange new planet. You looked around and saw many strange new creatures. What would you do? You would have to learn which creatures were dangerous and which were friendly. You would have to learn how to protect yourself from the dangerous creatures. That might take some time. While you were learning to fight them off, you would probably get hurt. If your enemy was very strong or if you were very weak, you might even be killed during battle. Defeating a dangerous creature would make you stronger. You would know how to fight it off the next time it came around. In time, you would learn how to stay strong and healthy on that strange new planet. Wouldn't it have been a lot easier if someone had given you a book with instructions on how to identify the dangerous creatures and how to protect yourself from them!

[2] This may sound like a silly story, but this is just what happens in your body when you are born. When you are born, your body enters a strange new land. It is filled with many new sights, sounds, smells, and dangers. Germs are everywhere in our world. Many of them don't bother us. Some of them are even good for us. The germs that we usually hear about, though, are the ones that make us sick. When we are babies, our bodies have never seen germs before. They do not know which ones are friendly and which ones are dangerous. Our bodies learn how to fight bad germs each time they meet a new one. Just as you might get hurt fighting an alien creature, our bodies get hurt when they are learning to fight off germs-we get sick. We are lucky, though. Doctors and scientists have learned how to give our bodies an instruction manual for fighting off the really bad germs. That instruction manual is a vaccine. Vaccines teach your body to recognize and defend itself against certain germs. It is sort of like a training camp inside your body! Your body learns how to fight the enemy, but no one gets hurt. You don't have to get sick!

[3] Most vaccines are given to babies and small children. They prevent dangerous illnesses that used to kill many people. Polio, measles, whooping cough, chicken pox, and many other illnesses are rarely seen now because of vaccines. While most vaccines are given to children, adults sometimes get vaccines, too. The flu shot is a vaccine that many people get every year. You have to get a new shot every year

because the flu germ is always changing. It is like a monster with many disguises. Your body might learn how to recognize it one year, but the next year it will have on a different disguise and your body will not recognize it.

[4] Most vaccines are given to you in the form of a shot. The shot contains a form of the germ that your body can easily defeat. Sometimes the shot contains a dead germ. Sometimes it only contains parts of the germ. These vaccines can never make you sick. A few vaccines are made using a weakened germ that is still alive. These can sometimes make you sick, but you will only have a very mild case of the illness.

[5] Your body has trillions of cells. Most cells have only one job. Some work to make your heart pump. Others work to send signals from your brain all over your body. Some cells have the job of protecting your body from invaders. These are the cells of your immune system.

[6] Every cell in your body wears a special uniform -- special markers that are the same on every cell. That makes it easy for the cells in your immune system to tell what cells are friendly. Your immune cells quickly recognize the uniform and move along. Each germ that enters your body has its own uniform. When you receive a vaccine, your immune cells see the strange new uniform and know that those cells don't belong. Your immune cells are on full alert. They work fast to learn how to defeat the germ, but it can take awhile. This is why you often feel bad for many days when you get sick. Your immune cells create the perfect soldier to defeat the germ. The soldier is a special type of immune cell that carries special weapons to prevent the germ from infecting any more healthy cells. Once the intruder has been eliminated, some of your immune cells take on the job of remembering this germ. Their job is to identify the same kind of germ if it ever returns and to build an army of soldiers to fight the germ quickly. Once your body has been exposed to a dangerous germ, it can defeat it quickly if it comes around again. Your body is so good at fighting the germ that you will probably never feel sick when your body sees the germ for a second or third time. Your body has become immune to the germ.

[7] Years ago, the only way to become immune to a germ was to get sick. Some of the germs were so bad that people would get very, very sick. Lots of people would die from the illness. Others were left disabled. Today we are very lucky to have vaccines to protect us from these terrible illnesses.

Name _____ Science Pd: _____

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1. _____ teach your body how to fight off dangerous germs without making you sick. (A) Doctors (B) Vaccines (C) Cells (D) Friendly germs	2. Which of the following illnesses can **not** be prevented with vaccines? (A) Measles (B) Lung cancer (C) The flu (D) Polio
3. Vaccines made from _____ can never make you sick.	4. After a germ has been defeated, your body has cells that _____ to quickly defeat the germ if it invades your body again. (A) Remember the germ (B) Create medicine (C) All of the above
5. How does your body's immune system identify dangerous germs?	6. Before vaccines,_____ was the only way to become immune to illnesses. (A) Leaving home (B) Donating blood (C) Getting sick (D) Getting a shot