



Math & Antibiotics

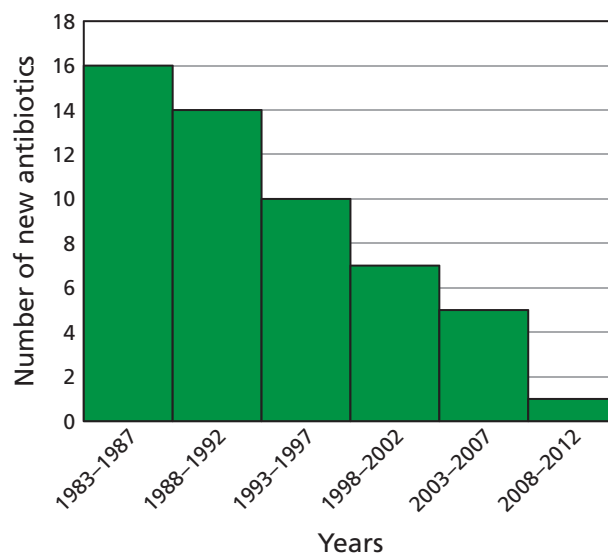
PROJECT: Are We Running Out of Antibiotics?

“In the future, historians of science may debate whether victory over bacteria was ever within our grasp. But it seems almost certain that the 60 or so years after penicillin came to market will eventually be viewed as just an interlude in the eternal war between us and them. We are multicelled animals of astonishing complexity and delicacy, moving through a world in which they vastly outnumber us. They are single-celled organisms so primitive they lack even a nucleus, marvelously adapted to multiply inside us—under the right circumstances, to consume our flesh and poison us with their waste. For a few decades we gained the upper hand through the use of antibiotics, natural substances that are as toxic to germs as germs are to us. But our ingenuity is in a desperate race against their ability to reproduce. More and more strains of bacteria are developing biological countermeasures to antibiotics—cell membranes that won’t let them in, tiny pumps that push them back out, biochemical tweaks that make them harmless. Evolution is a process that has been at work on earth for hundreds of millions of years; modern biological science has been around for less than a century and a half. Which would you bet on?”

Newsweek, Jeneen Interlandi



New Antibacterial Approvals (1983–2012)



1. The number of new antibiotics that have been approved by the U.S. Food and Drug Administration since 1983 are shown in the graph. What does this pattern show?
2. Use the Internet to find information about the number of “superbugs” that are becoming resistant to all our known forms of antibiotics. Present your findings graphically.
3. What can we do to help slow the number of new strains of bacteria that are resistant to all our known forms of antibiotics?
4. Do you agree with the *Newsweek* article that from the discovery of penicillin through the present is simply a “blip” in time during which we gained the upper hand against bacteria? Explain your reasoning.