Log Kill Rates Explained

A log kill rate tells you what percentage of bacteria or viruses are killed by a particular substance. To figure out the rate, scientists count the bacteria before and after a killing substance is applied. The rate is expressed as a whole number. To understand the rates, consider when a number is taken to a higher power. For example:10 x 10 x 10 = 1,000 and is denoted as 10^3

A log kill rate is the opposite of taking a number to a higher power. In thiscase, instead of multiplying an amount, we divide the number that many times according to the number of log kills or, in other words, move the decimal by one place for every logkill. For example, if we start with 100,000,000 bacteria and use a sanitizing substance with a log kill rate of 1, we divide by 10 once to kill 90% of the bacteria but we still have 10,000,000 bacteria when we're done. If we have a log rate of 2, we divide by ten then divide by ten again to only have 1,00,000 bacteria left. Thus, the higher the log rate, the more effective a solution will be. Using this methodology, the log kill rates are as follows:

Log Kill Rate	Number of Bacteria Left	Percentage Killed
0	100,000,000	0%
1	10,000,000	90%
2	1,000,000	99%
3	100,000	99.9%
4	10,000	99.99%
5	1,000	99.999%
6	100	99.9999%
7	10	99.99999%
8	1	99.999999%

Another way of looking at it. A log 3 kill rate leaves 1000 times [10x10x10] more bacteria behind than a log 6 kill rate.