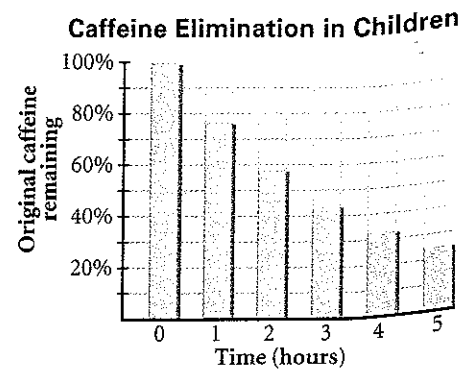


Modeling Biological Decay

APPLICATION HEALTH

Caffeine is eliminated from the bloodstream of a child at a rate of about 25% per hour. This exponential decrease in caffeine in a child's bloodstream is shown in the bar chart.



A *rate of decay* can be thought of as a negative growth rate. To obtain the multiplier for the decrease in caffeine in the bloodstream of a child, subtract the rate of decay from 100%. Thus, the multiplier is 0.75, as calculated below.

$$100\% - 25\% = 75\%, \text{ or } 0.75$$

Modeling Human Population Growth

APPLICATION DEMOGRAPHICS

Human populations grow much more slowly than bacterial populations. Bacterial populations that double each hour have a growth rate of 100% per hour. The population of the United States in 1990 was growing at a rate of about 8% per decade.

In Example 1, you will use this growth rate to make predictions.

