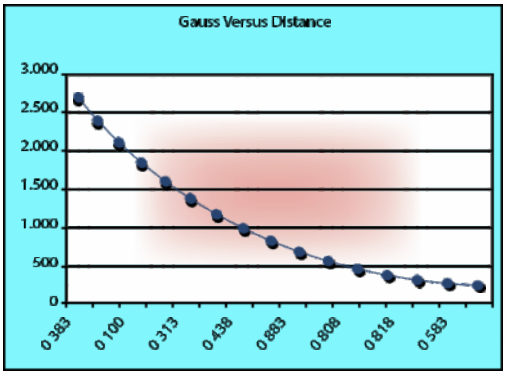
Magnetic Strength Over Time

Distance, x	Field at Distance x
0.063	2,690
0.125	2,320
0.188	1,970
0.250	1,660
0.313	1,390
0.375	1,160
0.438	970
0.500	810
0.563	680
0.625	580
0.688	490
0.750	420
0.813	360
0.875	310
0.938	270
1.000	240

How Does A Magnet's Strength Drop Off Over Distance?

The strength of a magnetic field drops off roughly exponentially over distance.
Here is an example of how the field (measured in Gauss) drops off with distance for a Samarium Cobalt Grade 18 disc magnet which is 1" in diameter and 1/2" long.



What Is The Equation For Field Strength Relative To Distance?

For a circular magnet with a radius of R and Length L, the field at the centerline of the magnet a distance X from the surface can be calculated by the following formula (where Br is the Residual Induction of the material):

$$Field_x = \frac{Br}{2}\left(\left(\frac{L+X}{\sqrt{R^2+(L+X)^2}}\right)-\frac{X}{\sqrt{R^2+X^2}}\right)$$

There are additional formulae that can be used to calculate the field from a rectangular magnet and magnets in other configurations, but the formulae get too long and complex looking to include here!