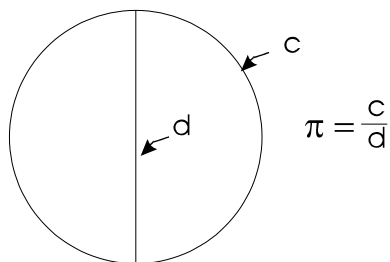## About π...

The number pi can be found by measuring the circumference, c, and the diameter, d, of a circle. Pi is the ratio of the circumference to the diameter.

$$\pi = \frac{c}{d}$$

About Count Buffon...

In 1777, Count George De Buffon proposed his needle problem. This problem defines a procedure for finding the value of pi experimentally using a statistical method.

His technique uses a grid of equally spaced lines on a flat surface. Let GridSpacing be the grid line spacing. He showed that if a needle with a length of NeedleLength < GridSpacing is dropped from random heights above the surface, the probability that the needle will meet a line is:

$$p = \frac{2 \times NeedleLength}{\pi \times GridSpacing}$$

The probability p can be found by:

$$p = \frac{\text{Number of Times Needle Crosses Line}}{\text{Number of Times Needle is Tossed}}$$

Count Buffon's efforts lead to the development of integral geometry.

The Solution...

The value of pi is:

$$p = 3.14159\ldots.$$

If your value of pi is quite different, use a different stick length or increase the number of tosses. The estimate of the probability of crossing a line will improve with more tosses.

Pi is an irrational number. An irrational number is a decimal number that continues forever. An irrational number can't be written as a ratio of two whole numbers – however—pi can be approximated by 22/7.

Nobody knows the real "true" value of pi. Computers have found the value of pi to millions of decimal places, however.

References

"The VNR Encyclopedia of Mathematics," by W. Gellert, H. Kustner, M. Hellwich, and H. Kastner, 1975.

Lunchbox Math Bytes

easy to digest mathematics for your lunchbox
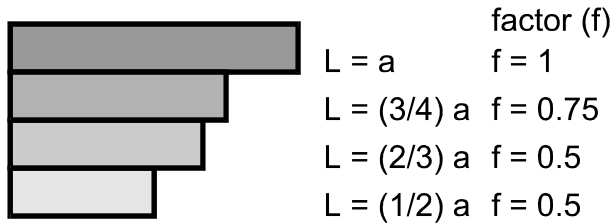
How About Some
π
For Dessert

You will need to pack:

Pretzel sticks or toothpicks.

Find π

Cut a toothpick or pretzel stick to one of these lengths. Only use one length.

	factor (f)
L = a	f = 1
L = (3/4) a	f = 0.75
L = (2/3) a	f = 0.5
L = (1/2) a	f = 0.5

Drop the stick from different height so that it falls on the board to the right. Keep a tally of the number of times the stick lands and crosses one of the lines. Only count the tosses in which the stick lands on the board for the total. The accuracy of your estimate of pi is better if you do more tosses.

Total Tosses	Landed on Line
Total Tosses=	Total Crosses =

$$\pi = \frac{2\,(\text{TotalTosses})\,f}{(\text{Total Crosses})}$$

where f is the factor f for the length of the stick you chose. The factor f is equal to the length of the stick divided by the spacing of the grid.