



MathsBites by Clifford the Dog

That's so ... random!

How many 'randoms' are there ...?

'Random' is a current buzzword among the young, with a sense of something distinctive but worthy of cool appreciation (like that *bone* is sooo... *random*). The notion has various meanings (see: <http://en.wikipedia.org/wiki/Randomness>) in different fields. In some way or other these are associated with non-predictability. What are some of the different definitions of random? Physical randomness in the natural world can be used to generate sets of random numbers.



Activity: The websites www.random.org/ and www.random.org/integers/ use atmospheric noise to generate random numbers. Use this to generate various sets and sequences of random numbers.

Pseudo-random numbers



These are generated using some kind of deterministic algorithm, typically implemented using technology (http://en.wikipedia.org/wiki/Random_number_generation). They can provide useful approximation to random behaviour and this is the type of 'random' number generator used by calculators. All of them have various limitations. The image on the left, created by Jeremy Smith from Oregon, USA shows a picture of elements in the plane from a pseudo-random number generator (for random access memory, or RAM). It can be found at <http://members.peak.org/~jeremy/randscape/>

Activity: find out about the 'middle square method' introduced by the mathematician John Von Neumann in 1949. Use it to generate several examples and discuss its limitations. Investigate the use of random number generators in art (see: www.ericjhellergallery.com) and random walks in various application contexts (http://en.wikipedia.org/wiki/Random_walk and www.stanford.edu/class/msande337/notes/walks.pdf).