



# The work of Alan Turing



Some of our SciBar participants prepared this glossary, independently of Jonathan Swinton. Your feedback on the level of information and usefulness of the SciBar glossaries is most welcome.

<p><b>Artificial intelligence</b>      The science and engineering of making intelligent machines, or intelligent computer programs. Alan Turing was interested in machines modelled on the neural networks of the human nervous system.</p> <p><b>Bombe</b>      A codebreaking machine designed by Alan Turing, which worked by testing large numbers of configurations of the German Enigma cipher machine.</p> <p><b>Fibonacci phyllotaxis</b>      The appearance of Fibonacci numbers in the structures of plants. Occurs in all sunflowers, for example, where the number of spirals of florets in the head are consecutive large Fibonacci numbers. Similar patterns can be found in pinecones and pineapples.</p> <p><b>Fibonacci sequence</b>      Each number is the sum of the previous two, i.e. 0,1,1,2,3,5,8,13,21,34, 55, ...</p> <p><b>Mark 1 computer</b>      Built at Manchester University from 1948–51, it used cathode ray tubes to ‘store’ digits on a screen, thus keeping track of numbers during a calculation. Turing worked on software for this early computer.</p>	<p><b>Morphogenesis</b>      The theory of how form and shape develop as an organism matures, such as the patterns on butterfly wings or the formation of leaf buds.</p> <p><b>Turing patterns</b>      Turing suggested in 1952 that chemicals called morphogens reacting together and diffusing through tissue could trigger formation of a stable pattern from an initially random or uniform arrangement of these diffusible substances. Such patterns of chemical concentration, for example of growth hormones within a cell, could make cells move within tissue as an organism grows and hence lead to morphogenesis.</p> <p><b>Turing machine</b>      A theoretical computing machine invented by Alan Turing in 1936, which was not intended to be built. It can write, read and erase symbols from an infinitely long tape and hence can modify its own instructions or ‘program’. A ‘universal Turing machine’ is capable of calculating any computable function.</p> <p><b>Turing test</b>      An ‘intelligence’ test for machines, to see if a human questioning the machine by text can detect whether they are communicating with another human or a computer program.</p>
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**Useful weblinks:**  
<http://www.turing.org.uk/turing/>      Andrew Hodges’s website dedicated to Alan Turing: huge amount of information and fantastic series of links