

STEAM Essay – Links Between Maths and Art, in particular the animated cartoon, The Simpsons.

A cartoon is a type of illustration that is typically drawn, an artform that is built from simple drawings which feature characters that are usually drawn in a humorous or exaggerated way. Cartoons can be animated and one such animation is The Simpsons.

The Simpsons is an animated sitcom featuring the Simpson family and their antics.



Many people believe that any good animation these days requires advanced computer programming skills along with many maths skills – such as trigonometry and geometry, calculus and statistics as well as advanced number work. There is a lot of maths behind the scenes when producing animated cartoons. Lots of animators today have degrees in Maths, Physics, English and Computer Science.

Recently I had the privilege of having a zoom meeting with a scientific author called Simon Singh. He brought to my attention just how many maths references, puzzles and problems to solve were hidden in every episode of The Simpsons. Research then showed an endless supply of mathematical jokes and references hidden away yet visible for all to see - which are well known in the maths community. The animators themselves are mostly maths geeks!!!

Simon Singh even wrote a book titled 'The Simpsons and their mathematical secrets' which identifies hidden maths in the animation and helps you in trying to spot, solve or understand the mathematical references.

Within the programme many of the characters make calculated mathematical jokes or express mathematical prowess. In a 2010 episode called 'Money Bart', Bart's sister Lisa needs to add extracurricular activities to her résumé, and so decides to coach Bart's Little League baseball team to diversify her portfolio. Taking the scientific approach, she immerses herself into sabermetrics, the use of complicated statistics to make managerial decisions. If you look carefully at the books she studies you can spot a book titled:

$$e^{i\pi} + 1 = 0$$

This is referred to by mathematicians as Euler's Identity and is considered to be the most beautiful in history because it combines five of the fundamental ingredients of maths (0,1,e, i and pi). Those maths geeks really do try and hide as many maths references and problems into each episode as they can!



Prime numbers hold a special place in the hearts of mathematicians, which is why writer Jeff Westbrook (an ex-Yale professor) inserted the number 8,191 onto the Jumbo-vision screen at Springfield stadium in “Marge and Homer Turn a Couple Play” (2006). Moreover, this is no ordinary prime number, because $8,191 = (2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2) - 1$. This means that it is known as a Mersenne prime number, named in honor of the Frenchman Marin Mersenne.

The cinema shown in The Simpsons is called the Googolplex - A googolplex refers to a phenomenally large number, namely 10^{googol} . But what is a googol? A googol is 10^{100} . The search engine Google is named after this vast number, albeit with a slightly different spelling, in order to indicate that it offers its users access to vast amounts of information. More maths geekery hidden in the animation.



Sometimes the maths is hidden away and other times it is more obvious but there is a definite link between maths and the art of cartoon drawing and animation within The Simpsons. Why not watch a few episodes and see if you can spot the hidden maths?