

Introducing Numberphile

Reviewed by Shashidhar Jagadeeshan

Ever since we decided to reintroduce our readers to Numberphile (<https://www.numberphile.com/>), I have been obsessively watching videos hosted via YouTube on the site! I have also listened to some podcasts. The content is both mathematics and interviews with mathematicians about a range of topics from “Why do people hate mathematics?” to “Fame and Admiration.”

The YouTube videos (*Numberphile* and *Numberphile2*) range from short videos (sometimes less than 5 minutes) to about an hour, and host a plethora of topics. Apart from the obvious and popular numbers like π , the Golden Ratio and 1729, they also introduce the viewers to different topics in mathematics. My most recent favourite is one in which Zvezdelina Stankova introduces the technique of inversion to prove Ptolemy’s Theorem.

The Podcasts (*The Numberphile Podcast*) are longer and have in-depth interviews with well-known mathematicians.

AtRiA readers will be glad to find (in the videos and the podcasts) not only many topics that have been covered in the magazine, but also the work of many of the mathematicians we have featured here. For example, there is an interview with Edward Frenkel whose book *Love and Maths* was reviewed in the March 2015 issue. There are interviews with Steven Strogatz (November 2018) and the Fields medallist Timothy Gower (November 2019).

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What unites these accomplished mathematicians is not only their love of mathematics, but also the desire to communicate it to a lay audience and infect them with their passion. Of course, “*The man who knew infinity*” – Srinivasa Ramanujan – has to be featured, because if there ever was a lover of numbers, and that too numbers with hitherto unknown properties, Ramanujan was the lord of them all.

What I really like is that beautiful and deep ideas are introduced to the viewer using mostly a large brown paper on which the mathematics is derived in a written form. The background knowledge needed is mostly school mathematics. The explanations are very clear, no steps are skipped, the enthusiasm of the teacher is palpable, and one ends up learning some amazing mathematics. All this, produced with excellent quality. I could watch several such videos a day!

As a teacher, you can use Numberphile in a variety of ways. First, learn new mathematics that you can share with students. If you have access to the internet in the classroom, you can watch the videos together with students. You can even use a short video on days when class is over before time! Together with your students, you can learn about the history of math and understand why mathematicians do what they do.

Here is how Dr Shirali uses them in his Math Club at Sahyadri School:

Let's take a well-known geometric problem associated with a configuration of three identical squares in a row (forming a 3×1 rectangle). Call the unit squares ABCD, DCEF and FEGH. Join A to C, E and G. Find the sum of angles ACB, AEB and AGB.

There are amazingly many extremely elegant solutions to this problem. One solution is presented in one of the videos (<https://www.youtube.com/watch?v=m5evLoL0xwg>). I had given this problem to the students, and they slogged on it for a week, then I showed them this video. Some of them had found alternate solutions.

In the same way, I have shown other videos. In some cases, without any preparation; e.g., the video on the Collatz problem.

Now that John Conway has passed away, I will certainly show them one of the videos featuring Conway (see tribute of Conway by Prof Ramanujam in this issue).

Numberphile is created by former BBC video journalist Brady Haran. Haran is also well known for YouTube channels like Periodic Videos and Sixty Symbols.