



The Textbook of the Future

Everything in our world follows mathematical laws, but the school curriculum rarely shows the incredible power and great beauty of mathematics. In most cases, it is simply about memorising abstract procedures and algorithms for solving exam questions. This is one of the reasons why so many students dislike maths, and it has become a significant problem for our economy and workforce.

At Mathigon, we developed a completely new content format to change how students learn online. It combines elements from textbooks, videos, physical manipulative and interactive software environments. Rather than passively listening to a lecture or watching a video, students can explore and discover, be curious and creative, and learn problem-solving and critical thinking. We call it the *Textbook of the Future* - but it is so much more than just a "book".



Active Learning

At every step, students have to actively participate in some way, before more content is revealed. Hundreds of unique interactive components go far beyond traditional question types like multiple choice: you can construct geometric shapes, run probability simulations, build tessellations, unfold 3D polyhedra, search the first million digits of Pi, trace chaotic pendulums, generate large prime numbers, draw sunflower spirals, and so much more.



Personalisation

Over time, we can build a detailed *knowledge tree* for every student, show more detailed explanations to struggling students, or reorder steps for which students have not mastered all prerequisites. A *virtual personal tutor* detects if you are stuck and provides real-time help and encouragement in a chat interface. Students can even ask their own questions which we answer using NLP.



Storytelling

Every course is filled with colourful diagrams and illustrations, and has a captivating narrative. Students learn not just about abstract concepts and equations, but also about real applications and historical context. This makes the content more fun and memorable, and shows students why what they learn is important.

The curriculum is aligned to the UK and US national standards but contains many additional topics like Graph Theory, Cryptography, Non-Euclidean Geometry, Combinatorics and Fractals. So far, we have completed around 20% of all the planned content for secondary mathematics.

Mathigon is completely free to use, and the content is published open-source on GitHub. Our website works seamlessly on all browsers and mobile devices, and our mobile apps for iOS and Android can even be used when offline.

Mathigon can be used independently by students, or as a blended learning tool in classrooms – and we offer a wide range of additional resources for teachers. Mathigon has around 30k unique active users every month, and we are working with volunteers to translate the content into other languages.

Mathigon was created by Philipp Legner, who previously studied Mathematics at Cambridge University, Maths Education at the UCL Institute of Education, as worked as a software engineer at Google, Bloomberg and Wolfram Research.



"One of the most accessible and engaging maths resources available on the web, a true mathematical wonderland."

Alex Bellos, The Guardian

"The content of Mathigon is superb."

Educational App Store

"Beautifully designed and interactive courses. A front-runner for a new generation of textbooks."

Common Sense Education (4 stars)

"Textbook is the wrong word, because this is something totally new."

learntechnology