



Mathema

An interactive popular science book about mathematics





Mathematics plays a key role in understanding the world around us, both through its connections to science and in its processes of rational thought. While many activities, like music or a game of tennis, can be appreciated in a passive way, by listening or watching, it is hard to find an equivalent for mathematics. One might wonder: isn't all mathematics known by now? - are there still things to discover? - what do research mathematicians actually do?

Is it possible to get any kind of understanding of the true experience of modern mathematics without investing the years of study necessary to become an expert? To answer this, Hugo Parlier and Paul Turner created the interactive book **Mathema**. They believe it is possible to get a general idea, as long as one is exposed to real mathematics. It doesn't have to be very complicated and can most certainly be fun, but it does have to be authentic. By showing its position as a meeting place between logical thought and creativity, **Mathema** provides insight into the hidden side of a fascinating subject.

Mathema is one of the first of a new generation of innovative book-apps utilising the full potential of touch-screen technology to convey ideas in an immersive, participatory way. The authors have devised a book which has interactivity at its core, combining engaging text with images that come alive, activities and games, explanatory videos and much more. **Mathema** is unprecedented in its use of multi-media technology to promote active learning.

A book, an app

Mathema is based around three *Mathematical Experiences* which aim to show, in a very intuitive way and with no prior knowledge assumed, how mathematics is discovered, how progress is made and how mathematicians approach problems. Each *Experience* introduces a new mathematical object - simple, accessible and visually attractive - which forms the basis of activities and games. The reader is guided gradually from simple puzzles and investigative activities to an understanding of some genuine mathematics.

While the three *Experiences* illustrate the basic processes of mathematical investigation, two *Interludes* touch on general concepts such as the role of equations, dimensions, the infinitely big and the infinitely small, and four *Recreations* offer additional games of mathematical interest.

Mathema is a popular science *book*. However, it is a book with a difference: it comes alive in the readers hand. Animated images, activities, games, puzzles and explorations are an integral part of the reading experience, and in order to achieve this, **Mathema** has been coded as an *app*. At key moments when an oral explanation may be easier to follow than the written word, video explanations with a voiceover have also been inserted.



Who is it for?

Mathema is written for adults and teenagers motivated to know more about the true nature of the mathematical experience.

Readers of popular science

Mathematics plays a key role in science, yet modern mathematics often remains a mystery even to avid readers of popular science. Aiming to bridge this gap, **Mathema** provides insight into what mathematicians actually do.

High school and university students

Many students have not come into contact with modern mathematics, but are keen to go beyond the syllabus and are receptive to a broader view of what the subject is about. **Mathema** provides extra-curricular material to give a fresh perspective, to motivate and to inspire.

Educators

Motivating students isn't always easy and **Mathema**'s games and activities can be used in inquiry-based workshops, giving students the opportunity to explore mathematics in new ways.

Anyone curious about the subject...

One doesn't have to be an habitual consumer of the popular science literature to want to find out about mathematics. With no mathematical training required, **Mathema** is ideal for anyone curious to know more about this extraordinary discipline.

Who created Mathema?

The Authors

Mathema was created by Hugo Parlier and Paul Turner, mathematicians working in Switzerland at the universities of Fribourg and Geneva. They have each authored many research publications in geometry and topology and have taught mathematics at university level for many years.

Hugo Parlier <http://homeweb.unifr.ch/parlierh/pub/>

Paul Turner <http://www.unige.ch/~turnerpa/>

Swiss National Science Foundation

The AGORA programme of the Swiss National Science Foundation provides support for researchers in communicating with the public.

AGORA <http://www.snf.ch/en/funding/science-communication/agora/>

Tombooks

Founded in 2010 by Thomas Steinmann, the publishing company Tombooks specialises in innovative book apps which provide the reader with an immersive, multi-sensory experience. Each work combines cutting edge technology, handcrafted design and quality authorship.

In an ever expanding portfolio, the first editions have focused on music and painting, including biographies of composers, musical scores and a virtual art gallery. Promoting active learning through interactive technology, with an uncompromising approach to quality, each Tombook is made to stimulate the mind.

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