Three game modes
BASIC, INTERMEDIATE, ADVANCED
From 8 to 99 years old

MATHEMATICUS®

The game of mathematics

Have fun with numbers

Test and improve your mathematical knowledge

BAJ GAMES

The box contains 525 pieces and printed parts featuring 1,428 illustrations

Mathematicus is a one-of-a-kind game that debunks the legend that mathematics is a hard, sterile subject. Mathematics is undeniably the foundation of science and all technical matters, but it is also entertaining and offers an incredible variety of experiences. This is confirmed by the recent proliferation of studies carried out on recreational mathematics, from childhood stages to advanced mathematic enthusiasts.
In addition, this game aims to propose and enhance, in accordance with the latest trends, knowledge of ancient and “exotic” mathematics. Understanding how numbers were written and counted in former times by extinct civilizations on different continents is both interesting and highly formative.

CARDS
Some of the 412 four-level question cards.

The game shows that mathematics is something that has accompanied human civilizations since their earliest developments and is a universal language.
The game aims to offer a roundup of the most curious and exciting aspects of mathematics through the themes presented in the squares and insights available in the booklet; knowledge is also provided on how to perform interesting experiments. However, the game is not only an opportunity to enrich cultural awareness, but also a chance to become familiar with mathematics and more open to the world of science.
Furthermore, it is also a fun and practical activity. Competing with other players to give answers to fascinating questions, knowing how to use calculation tools from the past, composing numbers and performing operations like the Babylonians, the Egyptians or the Maya once did is a great source of satisfaction.

A game for everyone

No special knowledge of mathematics is required to play Mathematicus. In fact, the required knowledge to play at more advanced levels remains elementary maths that we all learnt in primary and secondary school.
The mathematical curiosities presented in the game squares and the booklet sometimes depict more complex concepts; however it is not necessary to understand them to play the game. For information purposes, these concepts are explained using the most basic notions.

The game objects: tokens, dice, pawns and hourglasses. The advanced game also uses the 165 tiles with the digits of the ancient and exotic numeral systems and the binary system.

How to play

Answering the questions of the cards you advance with your pawns (sometimes you also go backwards), trying to land on squares with advantages and avoid penalty squares, thanks to shrewd choice of the dice.
As the game contains so many variables making play varied and unpredictable right until the end, the final winner is unknown despite certain players seemingly having an advantage at various stages throughout the game.
Furthermore, the existence and concept of “challenges” increases player interaction and makes for a lively exchange.
The winner is the one who, by answering questions correctly and solving problems, succeeds in collecting the greatest number of famous mathematician figures.

The three modes of play

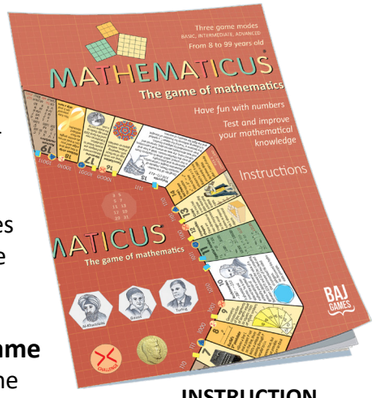
Mathematicus can be played in “basic” and “intermediate” modes using four different levels. This is possible as each card has questions with four progressive difficulty levels; in this way, players with diverse knowledge can play together. The players themselves decide on the game mode and level of questions and can combine different modes and levels, reflecting each player’s situation (age and background).
Example of a family to illustrate this concept: the daughter who is in her last year at secondary school plays at the highest difficulty level, the younger son who is still attending primary school plays at the lowest level, with parents or friends each deciding the most appropriate level.

Game board squares

The squares on the board present a series of mathematical curiosities which, although irrelevant to the game, are provided to illustrate how vast and interesting the world of mathematics is. The themes featured on each square are developed in the book.

The instruction manual

This 24-page manual presents the game pieces and sets down the rules for the three game modes.



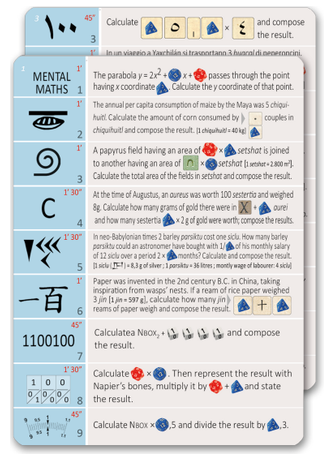
INSTRUCTION MANUAL

The advanced game

The advanced game introduces the player to the world of computing with ancient tools, which are the Napier’s Bones and the Slide Rule, and that of ancient and exotic numeral systems (Babylonian, Egyptian, Roman, Arabic, Mayan, Chinese), in the binary system and mental calculus. The player is required to compose numbers or perform simple operations using the required symbol tokens featuring the digits in the different systems. The advanced game has its own special question cards and is modular.
Choose to use any of the ten elements available in the advanced version. For example, players →

CARDS FOR THE ADVANCED GAME

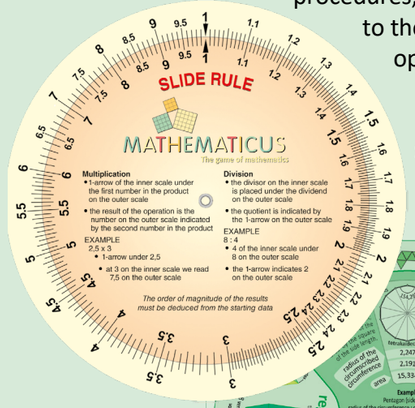
Arabic number question
Mental calculation question
Mayan number question
Egyptian number question
Roman number question
Babylonian number question
Chinese number question
Binary number question
Napier’s bones question
Slide Rule question



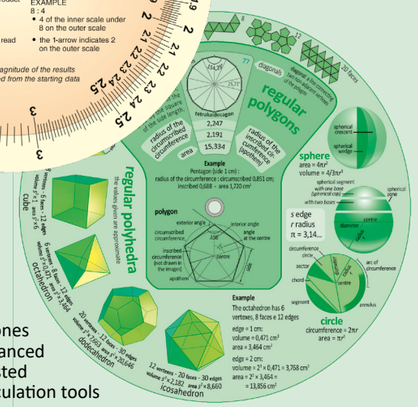
Mathematics from across the globe which spans all eras with “Mathematicus”

Calculating instruments from the past…

The book illustrates how to use two computing instruments from the past: the Slide Rule and the Napier’s Bones.
Although these instruments are obsolete, they are of fundamental historical value as well as being interesting and enjoyable to use.
In addition…they can function without electricity.
Performing calculations with these instruments allows us to go deeper into the algorithms that are applied to numbers to produce the result.
This process is managed step by step during the calculation operation.
Do you know the algorithm used by an electronic calculator when you push the “=” button?
Probably not, and to be honest, few people do.
Using these ancient computing instruments allows us to develop a closer relationship with mathematics, numbers and calculating procedures, albeit restricted to the area of basic operations.



SLIDE RULE

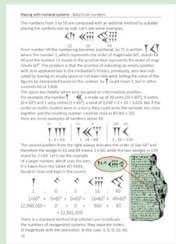


The Slide Rule and Napier’s Bones used in the advanced game, have existed as principal calculation tools for centuries.
The particular features of these tools are described in the manual and both are used to perform multiplication and division operations.

Some useful data on polygons and regular polyhedra, as well as on circles and spheres necessary to answer certain questions, is located on the reverse side of the Slide Rule.

Numeral systems

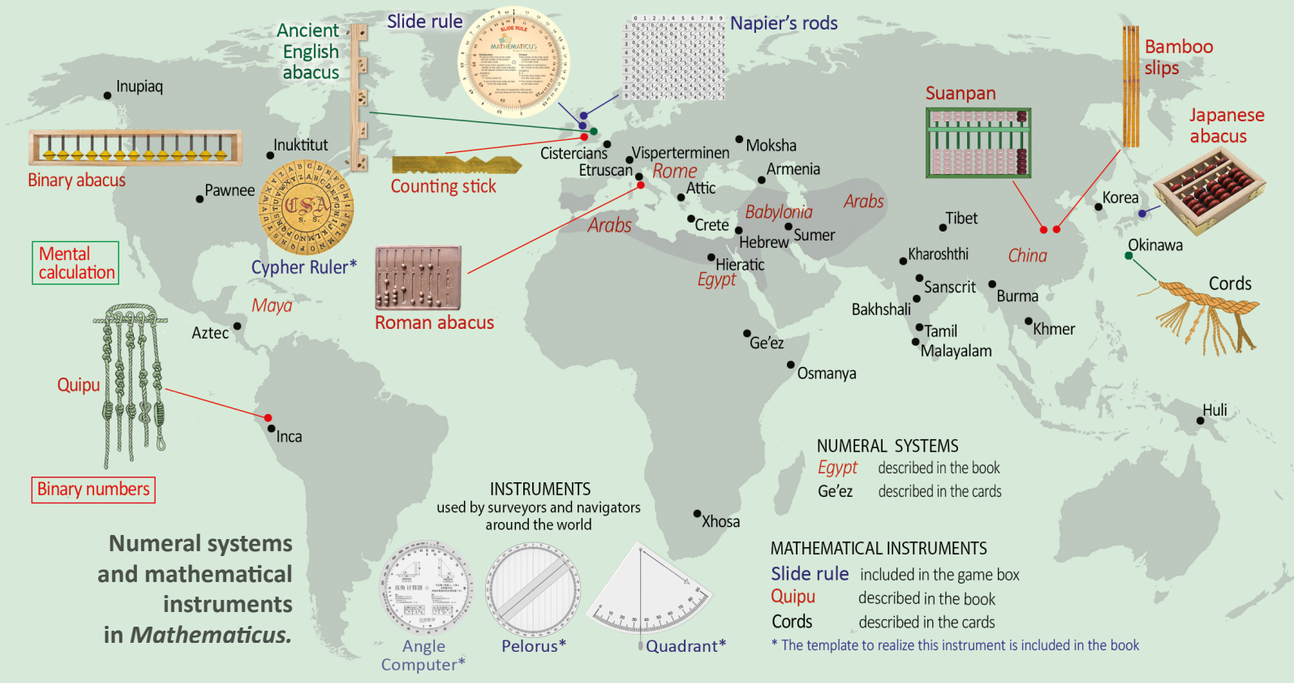
In order to play the game in advanced mode the player needs to be familiar with seven numeral systems (Arabic, Chinese, Egyptian, Roman, Babylonian, Mayan and binary).
The book explains how to read and write these numbers as well as making calculations with them.
Players are requested to answer the advanced card questions by using the symbol tokens which show the digits in the various systems.

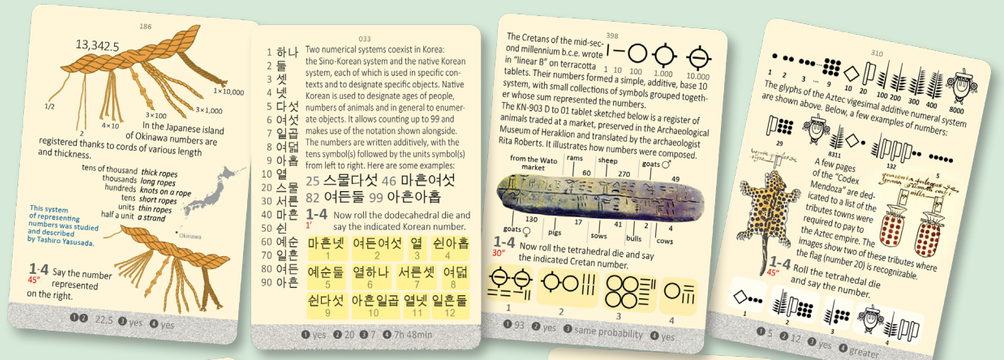


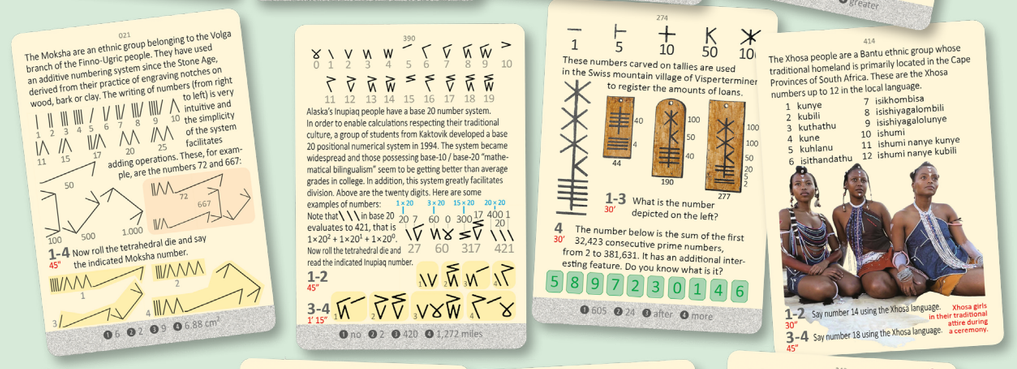
NAPIER’S BONES

×4

	0	1	2	3	4	5	6	7	8	9
1	0/0	0/1	0/2	0/3	0/4	0/5	0/6	0/7	0/8	0/9
2	0/0	0/2	0/4	0/6	0/8	1/0	1/2	1/4	1/6	1/8
3	0/0	0/3	0/6	0/9	1/2	1/5	1/8	2/1	2/4	2/7
4	0/0	0/4	0/8	1/2	1/6	2/0	2/4	2/8	3/2	3/6
5	0/0	0/5	1/0	1/5	2/0	2/5	3/0	3/5	4/0	4/5
6	0/0	0/6	1/2	1/8	2/4	3/0	3/6	4/2	4/8	5/4
7	0/0	0/7	1/4	2/1	2/8	3/5	4/2	4/9	5/6	6/3
8	0/0	0/8	1/6	2/4	3/2	4/0	4/8	5/6	6/4	7/2
9	0/0	0/9	1/8	2/7	3/6	4/5	5/4	6/3	7/2	8/1





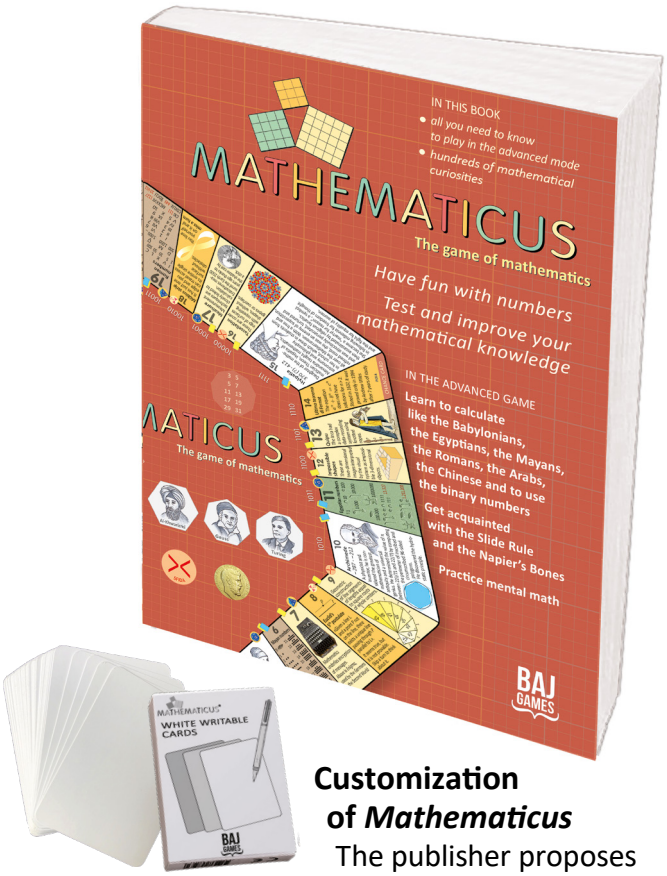


A few cards dealing with ancient and exotic numeral systems.

→ can choose to use only Napier's Bones, Roman and Arabic numerals, or any other combination of elements, in order to gradually familiarize themselves with the advanced game mode.

The book

The 176-page book provides useful knowledge for playing in advanced mode (page 4-41). Expanded descriptions of the topics featured on the 35 game squares can also be found in the book (page 45 - 157) alongside hundreds of mathematical curiosities and ideas for experiments.



Customization of *Mathematicus*

The publisher proposes blank sets of cards, intended for users to write questions for integration in standard game play.

Mathematicus in schools

Elements such as "manual" calculation tools, mental calculation and familiarization with ancient and exotic numbering systems strongly stimulate students to develop mathematical sensitivity.
The game additionally offers ample opportunities for experimentation outside of the game.
The booklet explains how to write and decode secret messages, how to prepare an interstellar message, how to prepare *quipu* in the style of the Incas, and how to wow friends with magical mathematical games, to name a few possibilities.

Information

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The author

Cesare Baj has dedicated his life to the diffusion of science.
He has collaborated with many publishing houses and written works on astronomy and aviation.

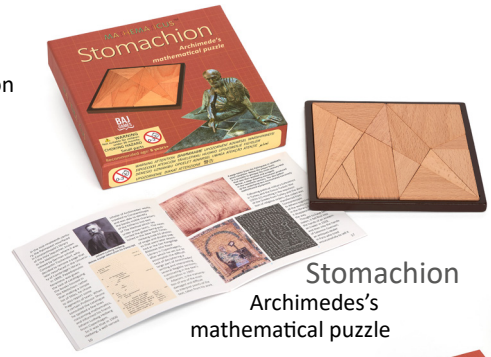
He founded and directed the science magazine for young adults *Newton*.
As an expert in analog computing, he has designed more than one hundred slide rules.

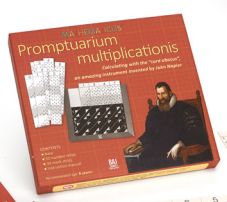
Simonetta Di Sieno, the former Director of the "matematita" Research Centre and members of the Milano Città Studi unit in the same centre, as well as members of the PRISTEM Centre belonging to Bocconi University in Milan have all contributed precious advice for the game preparation.

The translation of the English edition was done by **Morgan Rogers**, mathematician, University of Cambridge graduate and University of Insubria PhD and by **Victoria Finch**, linguist and a Leeds Metropolitan University graduate in European Languages and Business.

Other products...

An instruction and historical information booklet accompanies each product.





Solids of constant width

Napier's bones
Calculating using the ancient method invented by John Napier

Promptuarium multiplicationis
Calculating with the "card abacus", an amazing instrument invented by John Napier