BASE 10 Visual maths

BY TRIGONOS.CAT

A game to learn the basis of mathematics and our numeral system – the decimal system by adding, subtracting, dividing, multiplying... in a highly practical, visual and easy-to-understand way. Ideal for children aged 4 to 10 years old.

☐ **TRÍGONOS BASE 10 MINI:**

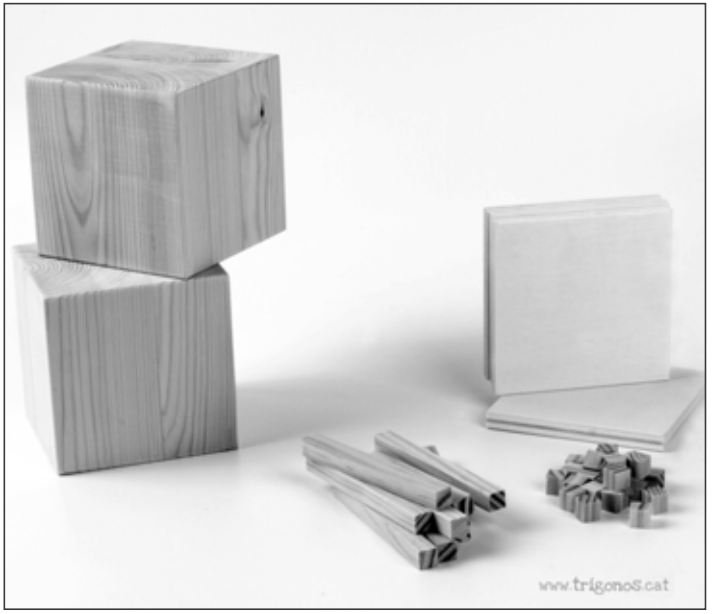
200	units
50	tens
25	hundreds
5	thousands
1	fabric bag
1	wooden box

☐ **TRÍGONOS BASE 10 MAXI:**

400	units
100	tens
50	hundreds
10	thousands
1	fabric bag
1	wooden box

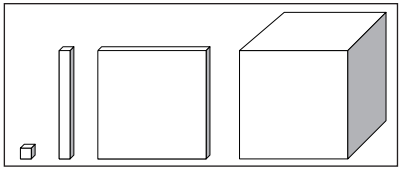
Trígonos Base 10 is conceived for children to learn by means of a tool they can see and touch: 3-d objects.

Understanding the concept of unit, ten, hundred or thousand, among others, is crucial for the child's mind to grasp and integrate the range of arithmetic operations we have.



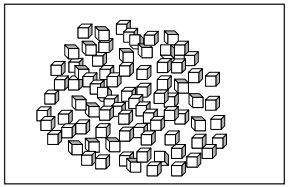
GAME PIECES

UNITS **(U)**
TENS **(T)**
HUNDREDS **(H)**
THOUSANDS **(Th)**

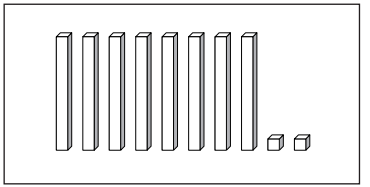


This material helps to understand the operation of our decimal (base 10) numeral system.

With this material, one can represent any amount (1-9,999) in base 10 by using very simple game rules: you can replace ten units by one ten; replace ten tens by one hundred and replace ten hundreds by one thousand, so that any unit amount belonging to the decimal system can be changed and shown.

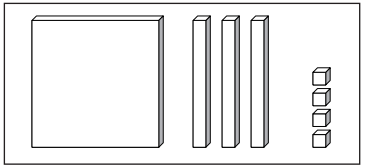


82 (U) from our material.



8 (T) 2 (U).

134 (U) from sea snails.



1 (H) 3 (T) 4 (U).

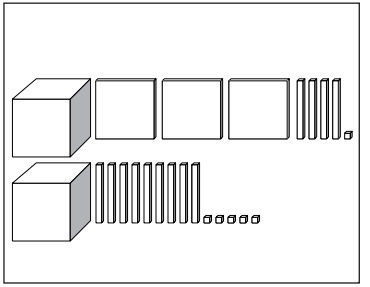
Once all changes are made, you can sort the material by placing the (Th) to the left of the game area, followed by the (H), then the (T) and finally, the (U). This is the order that will allow kids to interpret the amount usually rendered as numeral graphic symbols (134).

As it can be seen, this material allows kids to learn how our numeral system (base 10) works by using what they already know: an amount in the shape of 1 shaped piece. Kids apply game rules (the conventions of our numeral system) and reach what they still didn't know: how to represent the same amount, arranged on the grounds of base 10 and the correlation of this arrangement with the graphic representation of the amount (numeral writing) and its name (numeral reading).

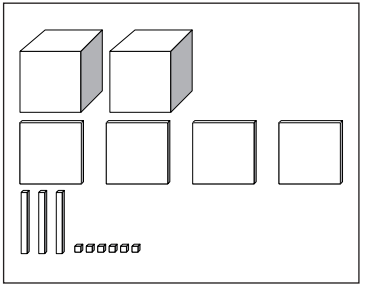
Another possibility this material provides is how to solve many arithmetic operations: addition, subtraction, multiplication, division, square root or to square a number, for instance, by just bearing in mind the meaning of each operation.

The following drawings, together with some brief explanations, are meant to show how these basic operations can be solved.

Addition: When we put two or bigger quantities together.

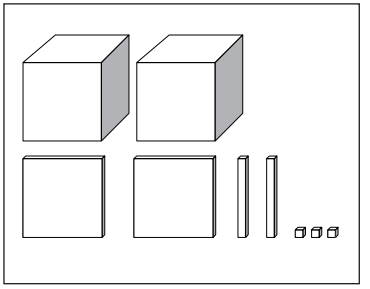


1,341+1,095
1. Presentation of both amounts.

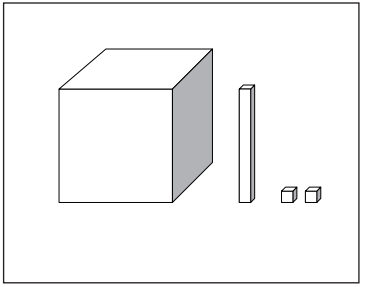


Result: 2,436
2. Grouping (H), (T) and (U) of both amounts.

Subtraction: What is left of an amount after removing a part.



2,223
1. Presentation of the amount from which a part will be removed (1,211).

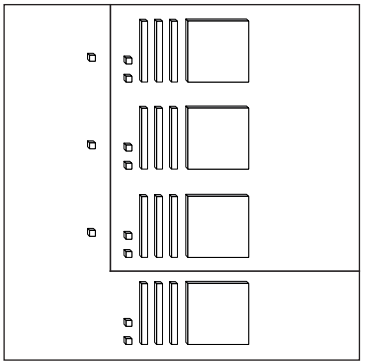


Result: 1,012
2. The result of removing (1,211) from the initial amount.

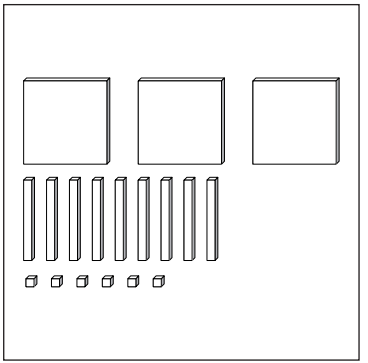
Should the aim be a subtraction with borrowing, it will be necessary to exchange 1 higher order element by 10 elements of lower order to be able to remove the amount indicated by the subtrahend..

Both in the addition and subtraction operations, kids usually start operations by taking the larger parts of the number in their hands (grouping for additions and removing for subtractions). This order, which is the opposite of the one used in solving routines for standard algorithms, will accompany children through their abstraction stage towards the power of approximate calculations.

Multiplication: When we repeat a specific number of times the same amount.

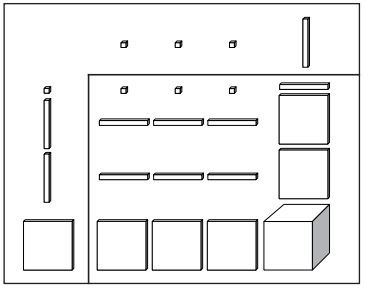


3x132
1. Presentation of the amount expressed as many times as indicated in the operation.

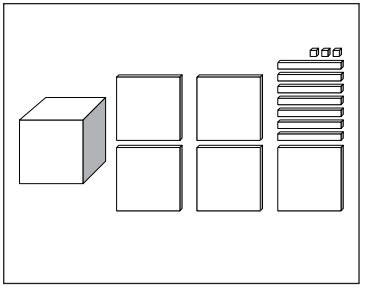


Result:396
2. Result of the addition obtained after grouping the repetitions of the amount.

When we divide by more than one digit, both the dividend and the divisor are represented using the necessary pieces of the decimal system, namely Th, H, T and U, since it would be hard to use U only.

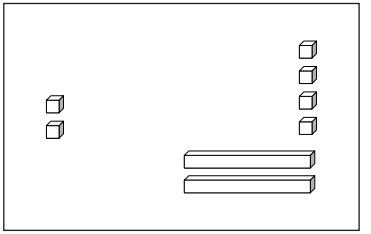


13x121

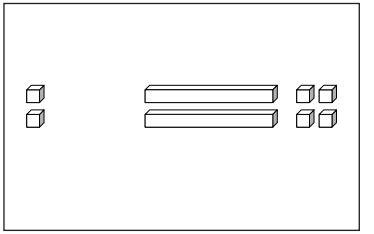


Result:1,573

Division: This is to make equal parts out of a specific amount and distribute them among the expressed elements or components.

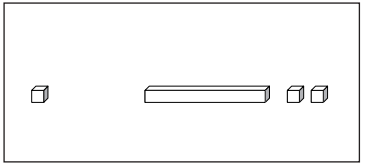


1. Presentation of the amount to be shared (dividend) and the amount of times we must do this (divisor).

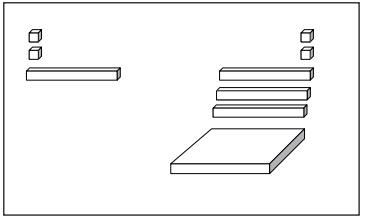


2. Distributing equal parts of the amount (starting by the bigger elements).

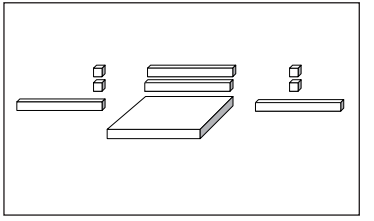
Result:12
3. The result is shown by the amount, out of the total, which corresponds to the unit.

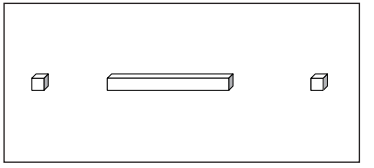


When we divide by more than one digit, both the dividend and the divisor are represented using the necessary pieces of the decimal system, namely Th, H, T and U, since it would be hard to use U only.



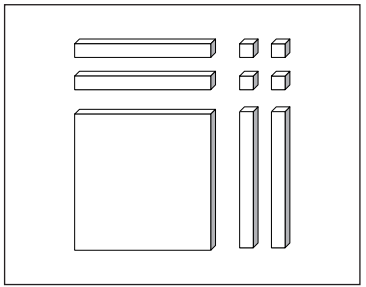
132:12



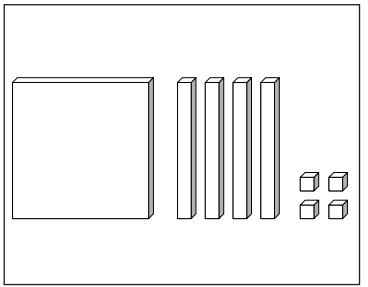


Result: 11

To square a number: This is the representation of the square shape formed by a specific amount. Kids will understand this as a surface area measurement.

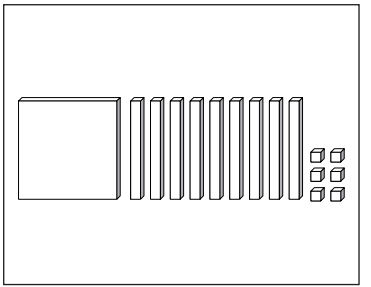


1. Presentation of a square shape in which each of its sides equals the value of the number we want to square.

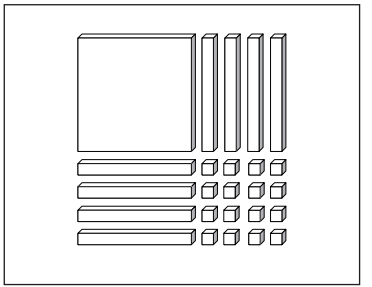


Result:144
2. The addition of all pieces forming the square shape.

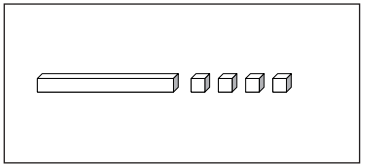
Square root: This is the value of each side of the square shape made with a specific amount.



✓196
1. Presentation of the pieces with which the square shape must be formed.



2. Arrangement of the pieces to form the largest possible square shape.
*1(T) has been broken down into 10 (U)



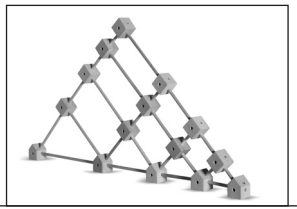
Result: 14
3. The value of one side of the represented square shape.

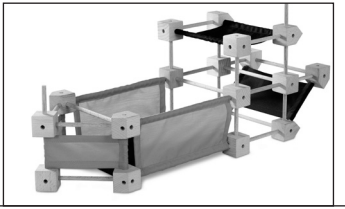
Lara Giménez Barragán

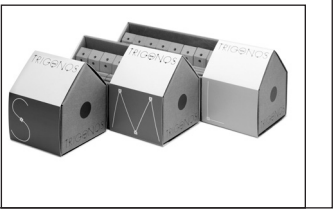
Do you know our Trígonos construction game?

TRIGONOS Build a whole world of magic with wood and fabric!

A creative game using building for children aged 4-10, and for those over 10, 20, 40...and 80.







BASE 10
BY TRIGONOS.CAT

Trígonos is a hand-made, educational game that is produced in a manner that is respectful of the environment. Made in Catalonia, European Union.