Grades 5-8 (S), 9 (S)

Duration: 10-20 min

Tools: one Logifaces Set / class

Individual work

Keywords: Number systems

307 - Number with Base 4

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MATHS / NUMBERS

LOGIFACES METHODOLOGY

Erasmus+

TEACHER

Logifaces

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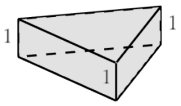
DESCRIPTION

Heights of Logifaces blocks are marked with numbers 1, 2 and 3. Numbers 0, 1, 2, 3 are representing digits in the number system with the basis 4. Students convert these numbers into numbers written in the base 10 number system.

SOLUTIONS / EXAMPLES

There are a few examples in the following lines.
EXAMPLE 1:

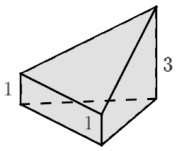
$111_{(4)} \longrightarrow 21_{(10)}$



Proof: $111_{(4)} = 1 \times 4^2 + 1 \times 4^1 + 1 \times 4^0 = 16 + 4 + 1 = 21_{(10)}$

EXAMPLE 2:

$311_{(4)} \longrightarrow 53_{(10)}$



Proof: $311_{(4)} = 3 \times 4^2 + 1 \times 4^1 + 1 \times 4^0 = 3 \times 16 + 4 + 1 = 53_{(10)}$

Note that if we represent the same block with a different sequence of numbers, we get a different numeric value:

$113_{(4)} \longrightarrow 23_{(10)}$

$131_{(4)} \longrightarrow 29_{(10)}$

PRIOR KNOWLEDGE

Exponentiation of numbers, Division of numbers, Remainder in division.

RECOMMENDATIONS / COMMENTS

As a similar exercise, we recommend exercise 306 - Binary System. This exercise is suitable for drawing students' attention to the fact that the same Logifaces block can be coded with different strings of numbers.