CHALLENGE
- MACARONI -

Educational Goals

❖ Highlight the playful potential of mathematics

❖ Give an approximation of the result of a multiplication or an addition

Key Features of the Targeted Competencies

❖ To decode the elements of the situational problem

❖ To modelize the situational problem

❖ To apply different strategies in order to elaborate the solution

❖ To validate the solution

❖ To define the elements of the mathematical situation

❖ To mobilize and apply concepts and processes appropriate to the given situation

Concepts Used

❖ Arithmetic (addition, subtraction, multiplication, division)

❖ Mean

❖ Calculating the volume

❖ Units of measurement for the volume (L, cm^3, m^3)

Materials

❖ Explanation Sheet

❖ Pencils

❖ Paper

❖ Calculator (optional)

❖ 30 cm ruler

❖ Small bag of macaroni (for example, a filled sandwich bag)

❖ 1 m ruler

Targeted Academic Levels
Grades 3 to 6

Mathematical Field Concerned

Suggested Teaching Formula

Time Required
Approximately 45 minutes

Step 1: Introduction (5 minutes)
The challenge will be the following: the students will have to use their knowledge in mathematics, a bag of macaroni, a 30 cm ruler and a one metre ruler to try to determine the number of macaroni that can be contained in one cubic metre.

Before making any calculations, ask the class to estimate the number of macaroni necessary to fill the cubic metre.

Step 2: Planning (10 minutes)
Divide the class into teams of 3 or 4. Ask the children to discuss about a process to find the solution.

If needed, come back together over different possible strategies to proceed. Note the different ideas on the board, remaining fairly neutral with your reactions. The goal is not to send the whole class towards a same way of doing, but rather to encourage the diversity of the approaches and to give ideas to the students that were stuck.

Step 3: Process (15 minutes)
Distribute the materials so each team has a bag of macaroni. Put the 1 m rulers on a desk at the front where the students will go to use them. You can give them additional materials (one cm^3 cubes, one litre milk carton, …) to help them estimate the quantity. You can also ask every team to count its macaroni and estimate the total volume of all the macaroni of the class.

Ask the students to note every step of their process.

Step 4: Reveal the solution (15 minutes)

Each team presents its steps and its result to the rest of the class. Together, assess the results: are they realistic, are they bigger or smaller than what the students expected, what were the main difficulties encountered, are the results reliable, etc.