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Math for Migrants

Concepts for teaching units

Environment	The educational process is nowadays increasingly characterized by the presence of migrant or culturally non-mainstream students. In such an environment, even the didactic activities planned and proposed by the mathematics teacher must therefore favour the introduction, study and exchange of experiences and knowledge that are referable to activities that originate in different cultures and that can be considered, although not always explicitly, of a *non-academic* mathematics. The mathematical teaching units proposed – *M4M_IT-AREA_TU-1 & M4M_IT-AREA_TU-4* – therefore try to elicit and encourage the use of knowledge, skills and competences that have their roots in minority cultures that some students bring into the classroom and offer for the attention and reflection of the whole class. To encourage the enhancement and development of individual skills, but also collaboration and a more effective process of inclusion and cultural exchange, the teacher will organize the work in the classroom in small groups or, at least, in pairs.
Age of students/grade	M4M_IT-AREA_TU-1: Grade 8 / 9 M4M_IT-AREA_TU-4: Grade 6
Length of the unit	The length of the teaching units depends on the teacher's choice to progress or not in the development of the activities that are proposed to the class and of the mathematical contents referable to them and usable for the school level in which the TUs are proposed. M4M_IT-AREA_TU-1: 2 lessons, at least M4M_IT-AREA_TU-4: 2 lessons, at least
Materials needed	M4M_IT-AREA_TU-1 • Sheets of paper • Pencil • Ruler • Sticks • Ropes M4M_IT-AREA_TU-4 • Sheets of squared paper • Coloured pencils
Objectives	• Recognize regularity and properties in different contexts. • Explore through graphic activities. • Reflect and conjecture. • Debating among peers and with the teacher. • Use math knowledge in real life contexts.

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Content related anchor points	M4M_IT-AREA_TU-1 • Triangles • Quadrilaterals • Criteria of equality of triangles • Basic Euclidean geometry M4M_IT-AREA_TU-4 • Construction of the concept of the G.C.D. - Greatest Common Divisor • Multiples and divisors of a natural number, multiples and divisors common to several numbers. • Factoring natural numbers into prime factors.
Methodology related anchor points	• Teaching units should be developed in problem-solving mode. • Students work mainly in small groups so as to favour, among other things, the best inclusion of non-mainstream pupils and the development of their ability to use the language of the classroom, often a foreign language for them. • Teachers will mainly have a mediator role. • Only at the end of the didactic proposal teachers should propose to the students the reorganization of the mathematical concepts and instruments used. • The discussions are usually placed at the end of each activity; sometimes they are anticipated so as to meet the needs of students who encounter greater difficulties in the task. • The role of teachers is crucial, as they have to effectively manage the reflections and comments from students, in order to share with them a definition of the concepts they want to introduce.
Language related anchor points	Teachers must help their pupils overcome the learning barrier represented by the contrast between the simplicity of classroom language and the complexity of mathematics language. Indeed, teachers have to bear in mind that the language used in class is an element of further complexity for pupils from minority cultures with a different native language. Therefore, in addition to the mathematical aims the following aims should be considered as to the classroom language and migrant pupils: • increase of learners' capacity to understand and to elaborate the mathematical discourse; • improvement of the ability of reading and understanding mathematics textbooks and word problems; • improved usage of mathematical language; • reinforcement of mathematical glossary knowledge; • development of the ability to find a proper balance between natural language and mathematical language; • identification of pre-knowledge and attitudes towards mathematics by migrant students.

	In the activities the teacher should be a facilitator used by each pupils group both on the mathematical point of view and on the language point of view: each further interplay allows further improvement, and a step in mastery of communication in mathematics deals with a proportional step in mathematical knowledge too. Word meaning problems, and figures meaning support processes of conscious reflection on the relationship between mathematical language and everyday language for all the students, native and non-native speakers. More productive too, the activities on lexical and word-in-text meanings need to be considered by students who are taught mathematics in a second language because it allows them to correlate the meanings of the words to the different contexts in which they occur: mathematical or ordinary everyday communication language.

Appendixes

Sample activities: See ready-to-use teaching units “M4M_IT-AREA_TU-1” (BUILDING A HUT) and M4M_IT-AREA_TU-4 (*SONA* SAND DRAWINGS AND ARITHMETIC).