VISUAL PATTERNS TASKS: A TOOL TO GET NUMERICAL EXPRESSIONS

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Several international studies (TIMSS, PISA) have shown that Portuguese students have low results, on what concerns reasoning, problem solving and communication. So it has become clear that, successful change will depend upon the ability of teachers to incorporate new approaches into their practice that increase the mathematical power of their students.

In the mathematics literature we can see many references to the importance of both problem solving and patterns, that we can illustrate by the next sentences: Problem solving is in the heart of mathematics (Halmos, 1980) and Mathematics is the science of patterns (Devlin, 2002). A pattern based methodology approach challenges students to use higher order thinking skills. It uses and emphasizes exploration, investigation, conjecture and generalization. Therefore we defend that we must teach students to recognize patterns in mathematics and to use patterns to solve problems. Besides, students find patterns, as well as problem solving, interesting and challenging.

So, instructional mathematics programs should enable students, from pre-kindergarten through grade 12, to engage in several tasks involving the understanding of problems, patterns, relations and functions (NCTM, 2000). Besides, the ability to find and describe patterns found in number, operations, charts, geometric figures and so on, is important for the development of a deeper understanding of mathematics in general and in algebra in particular. Many educators consider using patterns to promote and provoke generalization as a pre-algebraic activity (e.g. Mason, 1996). If algebra is a tool for expressing generalities, exploring repeating and growing patterns in the elementary levels lays the foundation for the algebraic reasoning. School teachers traditionally have a tendency to explore more the numerical than the visual patterns. However it is important in this level, that students translate visual patterns into numerical expressions and explore the equivalent numerical expressions that visual patterns can be translated into.

In this poster we will present some pattern problem tasks and different ways to express them, where it is shown the relation between visual and numerical patterns.
REFERENCES


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