

# Mathematical Modeling in Mathematical Literacy: The Study of the Brazilian Monetary System

Rosângela Maria Kowalek\*  
Daniel José Kmita†

## Abstract

Mathematical Modeling in Mathematical Education is presented as a methodology to be used since the first school years (BURAK, 1994; MAA $\beta$ , 2005; LUNA, 2007; MARCONDES and SILVA, 2019). Still, studies like the one by Kowalek and Veleda (2019) point to Mathematical Modeling as a methodology that provides Mathematical Literacy addressing topics of interest to students. Thus, taking into account the research already carried out and seeking to corroborate with studies in the area, we developed the present work, in which we aim to briefly present the teaching of the Brazilian monetary system through a Mathematical Modeling activity with a multiserial class of the Literacy Cycle composed of six 1st year students and three 2nd year students. To this end, an activity was developed using the Mathematical Modeling methodology (BURAK, 2010) which had the theme "games", chosen by the students in the class. The students' interest was the prices of games and toys. As the students had no knowledge about banknotes and coins, the values of the banknotes were initially studied, and the teacher presented the class with a domino game with pieces of money so that the students, when playing, could get to know the banknotes. Subsequently, false notes were used so that students could form specific values. With students already familiar with banknotes and coins, a toy "shop" was held in the classroom in which students brought toys from home, in which some sold and others bought, providing opportunities to work with the values of the toys to be used, paid and the concept of change. From the development of the activity it is possible to make some considerations in relation to the work with Mathematical Modeling in the Literacy Cycle, highlighting that the teaching linked with activity of themes of interest to the students actively involves them in the learning process. It was also possible to realize that the work with the monetary system provided students with recognition of the banknotes and coins that circulate in Brazil, their values, exchanges and use that are objectives of Mathematical Literacy present in the Official Brazilian Document (2012).

## References

- [1] D. Burak, Modelagem Matemática sob um olhar de Educação Matemática e suas implicações para a construção do conhecimento matemático em sala de

---

\*e-mail: [rosangelakowalek1@gmail.com](mailto:rosangelakowalek1@gmail.com), Londrina State University, Londrina, Paraná, Brazil.

†e-mail: [enm-danielkmita@uniguacu.edu.br](mailto:enm-danielkmita@uniguacu.edu.br), Paraná State University - Campus of União da Vitória, União da Vitória, Paraná, Brazil.

- aula, *Revista de Modelagem em Educação Matemática* Blumenau, v.1, n. 1, p. 47-60, 2010.
- [2] D. Burak, Critérios norteadores para a adoção da Modelagem Matemática no Ensino Fundamental e Secundário, *Zetetiké* v.2, n. 2, p. 10-27, 1994.
- [3] A. V. A. Luna, Modelagem Matemática nas séries iniciais do Ensino Fundamental: um estudo de caso no 1º ciclo, *CONFERÊNCIA INTERAMERICANA DE EDUCACION MATEMATICA*, 12, *Santiago de Querétaro. Anais...* Santiago de Querétaro: Comitê Interamericano de Educación Matemática, 2007. 1 CDROM.
- [4] R. Kowalek; G. Veleza, Uma Prática com Modelagem Matemática no Ciclo de Alfabetização: Um Olhar para os Objetivos de Aprendizagem Modelagem Matemática, *CONFERÊNCIA NACIONAL SOBRE MODELAGEM MATEMÁTICA NA EDUCAÇÃO MATEMÁTICA*, 11., *Belo Horizonte. Anais...* Minas Gerais: UFMG, 2019. p. 1-16.
- [5] K. Maaß, Barriers and opportunities for the integration of modelling in mathematics classes: results of an empirical study, *Teaching Mathematics and Its Application* v. 24, n. 2-3, p. 61-74, 2005.
- [6] C. F. Marcondes; V. S. Silva, Modelagem matemática na educação infantil: considerações a partir de uma prática educativa com crianças de 3 e 4 anos, *Revista de Educação Matemática* São Paulo, v. 16, n. 21, p. 71-87, jan. /abr. 2019.
- [7] BRASIL, *Elementos conceituais e metodológicos para definição dos direitos de aprendizagem e desenvolvimentos do Ciclo de Alfabetização (1º, 2º e 3º anos) do Ensino Fundamental*, MEC: Brasília, 2012.