

# Use of tactile materials for Astronomy teaching for visually- and hearing-impaired public schools in Minas Gerais

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**Abstract.** This work deals with the use of tactile materials as a pedagogical tool for the teaching of Astronomy, and this material was used in a didactic activity with 44 students of the public elementary school in Minas Gerais. A visually impaired student and another hearing impaired participated, being these the focus of the research. With the tactile visual material elaborated, the objective was to develop themes such as phases of the Moon, eclipses and Solar System. Two questionnaires were applied and revealed an improvement in the concepts related to Astronomy and in the socialization of disabled students with the group after the didactic activity.

**Resumo.** Este trabalho aborda o uso de materiais táteis como ferramenta pedagógica para o ensino de Astronomia, sendo este material utilizado em uma atividade didática com 44 alunos do Ensino Fundamental de uma escola pública de Minas Gerais. Um aluno deficiente visual e outro deficiente auditivo participaram, sendo esses o foco da pesquisa. Com o material tátil visual elaborado objetivou-se desenvolver temas como fases da Lua, eclipses e Sistema Solar. Dois questionários foram aplicados e revelaram uma melhora nos conceitos relacionados à Astronomia e na socialização dos alunos deficientes com a turma após a atividade didática realizada.

**Keywords.** Teaching of Astronomy

## 1. Introduction

Being a teacher goes far beyond teaching a class. It becomes necessary for the teacher to adapt to a new problem every day and to find a way to solve it. Often teachers come across a class with a great diversity of students, with different skills, experiences, cultures and limitations (Dickman & Ferreira 2008). Public Inclusion Policies (Brazil 2008) ensure the entry and permanence of persons with disabilities in regular schools, having the right to have their educational needs met. Thus, a change in the teaching method is necessary, both to achieve a better development of students with disabilities, and to the regular students. This work deals with the use of tactile materials as a pedagogical tool for the teaching of Astronomy. It was carried out with students of the public elementary school in Minas Gerais, with 20 students from a group of eighth and 24 from the ninth grade of Elementary School. In these classes there are two disabled students being one blind and one deaf.

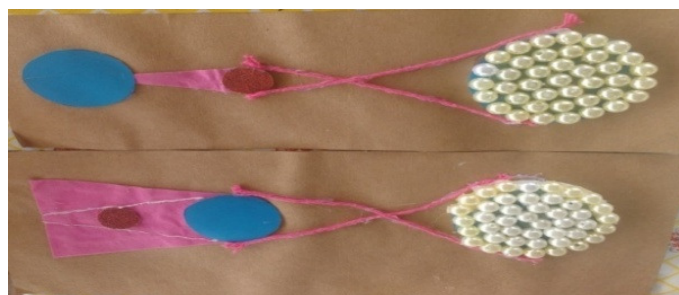
## 2. Objectives

The objective of this study was to analyze the Astronomy knowledge of a group of students in which students with visual impairment and deafness are enrolled, as well as to verify the contribution of the tactile materials produced to the learning of concepts related to Astronomy.

## 3. Methodology

In this work two questionnaires were used, the first one being applied to verify the students' knowledge on Astronomy subjects. From the analysis of this questionnaire, tactile materials were prepared for use by the students during the proposed pedagogical activity. The use of tactile materials for the teaching of

Astronomy was a proposal to try to alleviate the difficulties presented by the deficient students, visual and auditory, verified in the first questionnaire applied. The second questionnaire applied was aimed at verifying students' learning during the development of the proposed didactic activity. Figures 1 and 2 show part of the materials used.



**FIGURE 1.** Representative assembly of the Solar System using low cost materials.

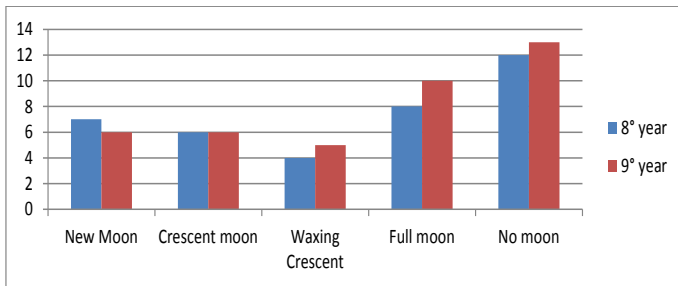
## 4. Results and Discussions

With question 6 was aimed to verify the students' knowledge regarding the phases of the Moon. An image of the four phases of the Moon was provided where students were to write the name corresponding to each phase. The data of this question are expressed in the graph in figure 3.

In general, most students scored between two and three phases of the Moon, and it was possible to see that the greatest confusion in the answers occurred in the waning and growing phases, in which only twelve students of the total hit Crescent



**FIGURE 2.** Representative assembly of Lunar and Solar eclipse using low cost materials.



**FIGURE 3.** Representative chart of the answers given to question 6 of the first questionnaire.

Moon and nine students of the total matched the Waning Crescent. The blind student could not identify any of the phases, while the deaf student was able to identify only the Full Moon.

## 5. Final Considerations

There was a significant improvement in the students' responses to the second questionnaire applied and in the socialization of the disabled with the class. It was observed that the material assembled to aid the disabled students also helped the other students of the class with regard to learning the concepts related to Astronomy.

## References

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