

Comics as a learning object about communication between Mars and Earth

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Abstract. The Physics teacher in High School (HS) finds alternatives so that the student can easily understand the concepts of radio waves and microwaves. The objective of this work is to build a Learning Object (LO) for the discipline of Physics through a Comics as a support for the teacher. For the development of the LO, a HagáQuê Bin, Tanaka and Rocha (1999) software from UNICAMP-SP, was used, gathering drawings, figures and information from the National Aeronautics and Space Administration (NASA) website in the context of the story. The results of the production of the Comics generated episodes briefly presented here. Evidencing the communication between Mars and Earth with artificial satellites and rovers on the Martian soil. Therefore, the production of the Comic book made it possible to improve the teaching by the teacher about electromagnetic waves.

Resumo. O professor de Física no Ensino Médio (EM) encontra alternativas de maneira que o aluno possa compreender de forma fácil os conceitos de ondas de rádio e micro-ondas. O objetivo deste trabalho é construir um Objeto de Aprendizagem (OA) para a disciplina de Física através de Histórias em Quadrinhos (HQ) como um suporte para o professor. Para o desenvolvimento do OA utilizou-se um software HagáQuê Bin, Tanaka e Rocha (1999) da UNICAMP-SP, reunindo desenhos, figuras e informações do site da National Aeronautics and Space Administration (NASA) no contexto da história. Os resultados da produção das HQ geraram episódios aqui resumidamente apresentados. Evidenciando a comunicação entre Marte e a Terra com os satélites artificiais e os rovers no solo marciano. Portanto, a produção da HQ possibilitou a melhoria no ensino pelo professor sobre ondas eletromagnéticas.

Keywords. Communication, Mars, Learning Object

1. Introduction

The Physics teacher in High School (HS) finds alternatives so that the student can easily understand the concepts of radio waves and microwaves with a didactic resource, the Comics, which makes the discipline of electromagnetic waves more modifying with the Teaching of Astronomy.

The objective of this work is to build a Learning Object (LO) for the discipline of Physics in HS through Comics as a support for the teacher in the classroom.

2. Methodology

For the development of the LO, a textbook by Godoy (2018) was used. Supported by a software HagáQuê by Bin (Tanaka and Rocha) from UNICAMP-SP, bringing together drawings, figures and information from Greicius (2020) and Greicius (2021) and Wild (2021) from the National Aeronautics and Space Administration (NASA) website in the context of history (Figure 1).

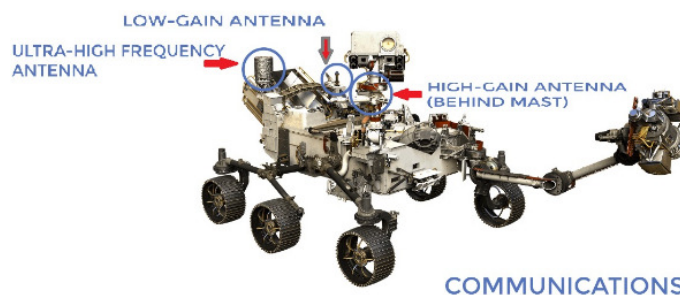
3. Results and discussion

The results of the Comics production generated two episodes with nine Comics. Evidencing the communication between Mars and Earth (Figure 2). With Curiosity and Perseverance rovers on the Martian surface and by satellites in orbit.

They use the transmission of radio waves in Ultra-High Frequency (UHF) in the range from 300 to 3,000 MHz, being part of the microwave range from 1,000 MHz to 10,000 MHz.

With terrestrial receivers in the United States, Spain and Australia to receive scientific data from Mars.

FIGURE 1. Communications

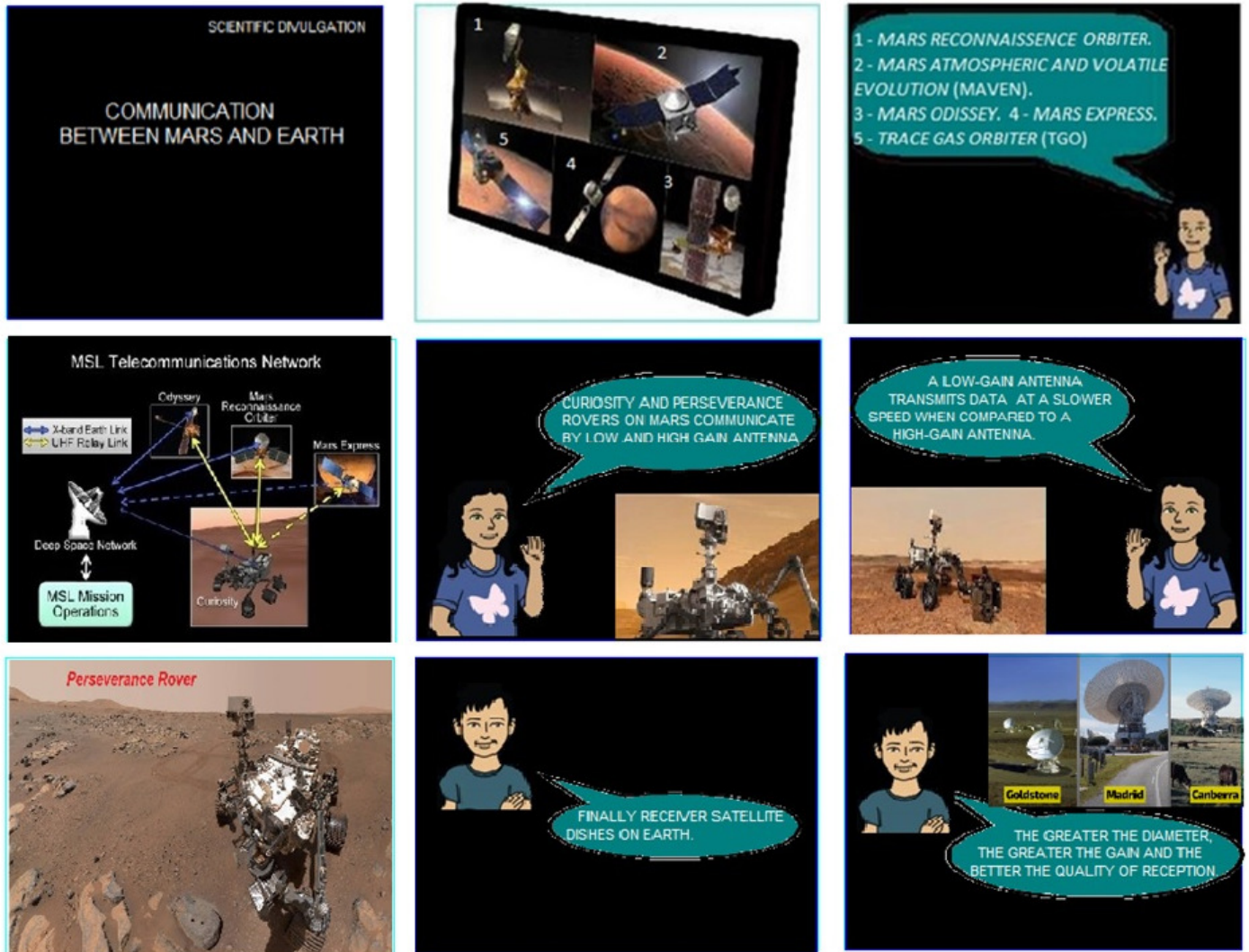


*Fonte: <https://mars.nasa.gov/mars2020/spacecraft/rover/communications/>

4. Conclusion

Therefore, the production of the Comic book made it possible to improve the teaching by the teacher about electromagnetic waves.

FIGURE 2. Communication between Mars and Earth



*Fonte: https://www.nasa.gov/mission_pages/msl/index.html

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