

Science fiction as a resource for the teaching of astrobiology in elementary school: a report of a pedagogical experience

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Introduction:

This work is a result of a pedagogical project performed with 5th grade students from elementary school at EMEF “Governador Mário Covas”, a public school in Marília/São Paulo – characterizing an action research. Our pedagogical/didactic goal was the teaching of the proposed contents for the age/grade: astronomy, notions of cosmology, life and evolution; in an interdisciplinary way. To do so, we resorted to a work with astrobiology for its key characteristic of interdisciplinarity, and also because of the curiosity evoked in the students by the hypothesis of the existence of life in other planets. Besides using texts of scientific content, this work was based on science fiction texts, not only to show astrobiological hypotheses of authors of this genre, but also as a way of literary expression for the students to systemize and socialize the knowledge built during the course of the project..

Methodology:

The work was performed in the classroom following these steps:

Step 1: the students had access to several texts of science fiction in reading circles.

Step 2: The students were divided in learning circles, and each group was in charge of researching about a specific Solar System planet. To do so, many astronomy books, encyclopedias and magazines (“Ciência Hoje para Crianças”) and also access to the internet in computer rooms were made available.

Step 3: Each group of students created an alien according to the characteristics of the chosen planet. The main iconographic reference was the book “Aliens in Space” by Steven Caldwell.

Step 4: The groups collectively wrote science fiction short stories, based on their previous researches.

Step 5: In reading circles, all the texts and knowledge built over the course of the project were socialized, and later exposed on a panel for the community.

Evaluation: the evaluation happened procedurally during the project, always aiming at the students’ understanding of the difference between astrobiology (science) – and therefore an activity that demands the testing and proving of the proposed hypotheses – and science fiction (literature) – therefore in favor or the use of imagination associated to the available scientific knowledge.

Picture 1. “Stone Man” from Mercury and “Gas Alien” from Saturn.



Attachment 1. Science fiction short story written by the students.

Os “Homens de Pedra” do planeta Mercúrio

Mercúrio é o menor planeta do Sistema Solar, o mais próximo do Sol, e também o mais rico em minério de ferro. O planeta Mercúrio é muito quente, porque ele é o planeta mais próximo do Sol, e então um ser humano qualquer não consegue resistir a queimadura no planeta. Por este motivo os alienígenas de Mercúrio são constituídos de pedra. Alguns destes alienígenas são muito grandes, e se parecem com humanos, outros são pequenos, igual a tartarugas. Até suas casas são feitas de pedra, e as pedras que eles fazem suas casas são enormes e muito pesadas. Seus três olhos são quadrados, seus dentes pequenos e muito afiados, com enormes chifres. É bom dizer que eles podem ser feitos de pedras coloridas (verde, vermelha, dourada, e etc.). Os humanos só conseguem mandar naves robôs para Mercúrio, e os alienígenas de Mercúrio não têm naves, então só conhecemos estes alienígenas por fotos tiradas por naves robôs.

Conclusões

Results obtained: this work allowed the students to understand that even though there is no life in other Solar System planets besides Earth (at least according to the current knowledge), if it existed, its biochemical, anatomical and even cultural (in case of intelligent life) constitution would adapt itself to the physical conditions of the inhabited planet.

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