

# Game of Biomes

N. S. Teles<sup>1</sup>, I. S. Junqueira<sup>2</sup> & D. Borges Pavani<sup>3</sup>

<sup>1</sup> Universidade Federal do Rio Grande do Sul, IGEO; e-mail: naiade.salinos@gmail.com

<sup>2</sup> Universidade Federal do Rio Grande do Sul, IBIO; e-mail: isadorasjunqueira@gmail.com

<sup>3</sup> Universidade Federal do Rio Grande do Sul, IF; e-mail: dpavani@if.ufrgs.br

**Abstract.** We present the process of production, development, and realization of the interactive workshop Game of Biomes (Jogo dos Biomas), the outreach program Itinerant Educational Observatory (Observatório Educativo Itinerante/OEI), of the Institute of Physics at UFRGS. This activity took place as a maintenance strategy for the actions of the OEI-IF/UFRGS during 2020 and 2021, due to the suspension of on-site activities by the university.

**Resumo.** Apresentamos o processo de produção, desenvolvimento e realização da oficina interativa Jogo dos Biomas, do programa de extensão Observatório Educativo Itinerante (Observatório Educativo Itinerante/OEI), do Instituto de Física da UFRGS. Essa atividade ocorreu como estratégia de manutenção das ações do OEI-IF/UFRGS durante os anos de 2020 e 2021, devido à suspensão das atividades presenciais pela universidade.

**Keywords.** Teaching of Astronomy — Earth — Sun: activity

## 1. Introduction

The Game of Biomes workshop, in both versions (synchronous and asynchronous), is focused on presenting the concepts of biomes and climate zones. The starting point is the interaction between the incidence of solar radiation and terrestrial ecosystems, linking themes of geography, biology, and astronomy. We seek to work in an interdisciplinary way, promoting environmental education through playful digital tools and instigating interest in the contents worked through the dynamics of the digital game.

The workshop was inspired by a didactic-pedagogical activity developed in the context of the Institutional Program for Teaching Initiation Scholarships (PIBID/UFRGS), between 2017 and 2018, by the Interdisciplinary Subproject Campus do Vale/UFRGS. Subsequently, the activity was transformed into a board game by an undergraduate thesis in Biological Sciences Tavares (2018). So, we adapted it to the context of remote classes, and we developed two versions.

## 2. The Game of Biomes

We approach the theme of Brazilian biomes, inviting reflection on the reasons for the climatic differences in the country, seeking to problematize the seasons of the year from two points of view, approached at the same time. In the first point of view, we bring what is expected as a characteristic of the weather pattern cyclic that repeats itself throughout the year (spring, winter, autumn, and summer). In the second one, we discuss the seasons of the year related to the Earth's position in its orbit around the Sun (considering solstitial and equinoctial points). Our purpose is to discuss the insolation variation according to the latitude of the place. In addition, we discuss climate zones and how characteristics of the local environment (relief, height concerning sea level, vegetation cover, etc.) and human activities impact the climate. From this debate, we present the 5 Brazilian biomes (Amazon, Caatinga, Cerrado, Atlantic Forest, Pampa, and Pantanal)<sup>1</sup>, seeking to discuss regional cultural characteristics, interactively, configuring the game itself.

The first version developed is focused on asynchronous dynamics and consists of an interactive video, using two free tools: one for the production of animated slides, and another for the production of a game-style activity. The last tool allows proposing questions like "true or false" and "complete the sentences". We use it to establish the characteristics of the Brazilian biome. This version was presented to Basic Education teachers from 3 public schools participating in the Southern Stars Project: Journey through Science (IF/UFRGS) linked to the Science at School Program (MCTI/CNPq), in meetings held throughout 2020. Based in this interaction, we made adaptations, specifically seeking to meet the demand for greater interaction with students.

As a result, we developed the second version, to be applied synchronously. Previously built interactive "slides" were used, but we use a new interactive games tool, in its free version, which allows real-time interactions, both during the initial explanation of the concepts and after when we add a game of riddles and trivia related to the characteristics of each Biome. The game's tool makes it possible to compare individual performances at the end.

## 3. Workshop Application

The workshop was applied in online events, free and open to the public. In the first one, in celebration of National Astronomy Day, the workshop was held by a diverse audience, from young people in the final years of elementary school to teachers of basic and higher education.

In the second event, in commemoration of the International Day of Women and Girls in Science, the participation was mainly of girls from the final grades of Elementary and High School. For both events, an anonymous online questionnaire was made available for participants to evaluate the workshop. The diversity of the audience allowed us to obtain a multifaceted look from students, teachers, and teachers about the application of the game.

<sup>1</sup> <https://www.ibge.gov.br/apps/biomas/>

#### 4. Conclusions

The development, realization, and evaluation of the workshop showed the potential of using alternative teaching tools, using technologies as allies in the teaching and learning process. Particularly in the context of the worldwide pandemic caused by Covid-19, when suddenly students and professors started to interact 100% remotely, developing activity of this nature, interconnecting contents present in the Common National Curriculum Base, proved capable to motivate both audiences. Our approach, exploring the theme of the seasons of the year, associating the astronomical phenomenon with climatic zones, biomes, and regional cultural characteristics, proved to be promising as a didactic strategy to promote a holistic understanding of the theme, considering the evaluation of the participants. At this stage, we are developing support material for educators, containing a glossary of the concepts worked on and also a list of free online tools that can be used for the application of the workshop or the development of new interactive activities inspired by the Game of Biomes. All materials produced are available on the website project<sup>2</sup>.

#### References

Tavares, C. P. 2018, in *Jogo dos biomas: potencial como ferramenta didática interdisciplinar*, UFRGS: Porto Alegre

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<sup>2</sup> [www.ufrgs.br/oeiaventureiros/](http://www.ufrgs.br/oeiaventureiros/)