

# A game about plate tectonics

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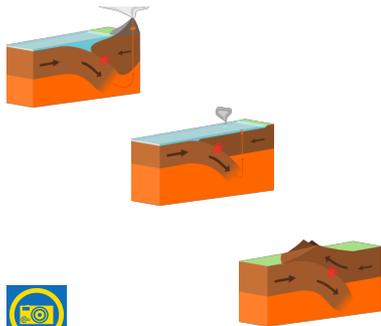
November 22, 2022

## Abstract

I present a game for teaching plate tectonics in the secondary school. The subject of the game is the interactions of plates and phenomena connected to it. The game is composed by cards that represent oceanic or continental lithospheres and a dice that indicated the type of boundary: convergent, divergent or transform. Students, generally in groups, collect “Events Cards”, for example “Earthquake” or “Volcano” or “Oceanic Trench” if they are able to identify the correct event associated to the boundary. The winner is who collects all “Events Cards”. The game is a cognitive model for involving students in a stimulating activity and for applying knowledge acquired in the process of problem-solving. Working in groups is an opportunity of peer to peer learning, where the content transmission occurs ‘horizontally’ with the teacher who acts as facilitator. The sharing of common rules within the class groups has also positive effects on group cohesion, also in contexts outside the school, implying teaching and educational values on social scale.

## Introduction

The game is a cognitive model for the study of complex phenomena while teaching sciences. Students are involved in a stimulating activity, able to drive their energies into a more complete learning and to keep their interest high. Everything in a structured context, without neglecting the scientific rigor. The educational outcome is a greater ability to apply knowledge acquired in the process of problem-solving. I present a game for teaching Earth Science. It's a game that can be used during the discussion of plate tectonics, referring to the movement of plates and the phenomena connected to it. The game is made by cards that simulate the collision between two plates and the events associated to plate boundaries.



## The Game

Students have two cards that represent the lithosphere: "Oceanic Lithosphere" and "Continental Lithosphere". They simulate the collision between lithospheres and they collect "Events Cards": "Earthquake", "Volcano", "Mountain", "Island Arc", "Oceanic Trench". The winner is who collect all events cards.

The class is divided in groups, the teacher gives to each group an oceanic and a continental lithosphere card. In each turn a group and the one to its right play a covered lithosphere card. Both cards are uncovered together and each group has to choose the right event card. If their choice is correct the group gains that card.

The game continues until a group has gained each type of event card.

Cards combination	Correct Event card
Continental - Oceanic	Earthquake, Volcano, Oceanic Trench
Oceanic - Oceanic	Earthquake, Oceanic Arc, Oceanic Trench
Continental - Continental	Earthquake, Mountain

## The Game

As a variation, if the cards drawn aren't different from each other, a dice roll can be added, on a one it will result in a transform boundary (giving only an "earthquake" event card); on a two or three it will be a divergent boundary (adding the "rift valley" and "mid-ocean ridge" event cards) and on a four, five or six it will signify a convergent boundary (keeping the same rules that apply for the base game).



## Discussion

The game turns out to be an opportunity of learning peer to peer, where the content transmission occurs horizontally with the teacher who acts as facilitator. The sharing of common rules within the class group has also positive effects on group cohesion that has a positive effect in areas outside the school, this implies teaching and educational value on large scale.

I'm trying to improve my educational games project by creating an app to make it more accessible for all students and teachers.

## References

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