Plate Tectonics for 2nd Graders

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INTRODUCTION

In this study the geological concept of Plate Tectonics was adapted to a 2nd grade learning level. Unlike a regular lesson plan, this project emphasized the geological concept. A major aspect of the work was taking higher level ideas and presenting them in engaging ways to address multiple learning styles such as kinesthetic and visual learning, via plate tectonics. This on the surface seems relatively simple but there are multiple intricacies that posed a challenge when attempting to teach 2nd graders. These challenges included vocabulary as well as complex topics such as convection currents. To combat these challenges a floating puzzle (Fig. 1A) was utilized as well as a case study and age-level materials, such as candy and movies (Fig. 1B). This helped to relay the intricacies of how the theory of plate tectonics was developed; how plates move; and the consequences of these movements.

Figure 1A: One of the five puzzles' students used in the buckets of water to simulate tectonic plates (puzzle pieces) and the asthenosphere (water).

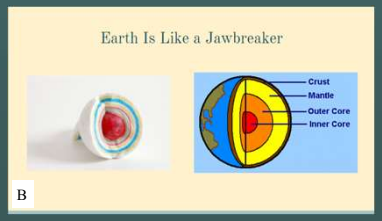

Figure 1B: Example of a slide used to relate Earth to a more familiar object like candy

METHODS

- Main concepts were identified from Earth Science textbooks
- Lesson was created using Google slides
- Activities planed based on concepts
- Candies analogous to geological concepts were identified and incorporated in lesson
- Puzzle was created using map of the world, which was then cut and laminated to be used in water
- Buckets for puzzles were acquired
- Movie titles and references were then added
- Hand and arm motions were identified

RESULTS

- Puzzle was useful as a tool and students referenced the puzzle frequently
- Students at end of lesson could identify types of tectonic boundaries
- Students understood and could explain convection currents
- Students understood how the tectonic plates have shifted

Figure 2: Students using arm motions to help better understand convection currents and how tectonic plates are moved via these currents.

DISCUSSION

Multiple adaptations were made to the original lesson based on lessons learned from the students participating in the project. For example, after the first group, the puzzles were moved to the floor due to students having issues reaching them on the table. There was also large amounts of water that spilled onto the table, which become a large distraction. Students also struggled to understand the evidence that was used to support Continental Drift. To combat this, more visuals and hand motions were added to the lesson to help students better understand the connection between the evidence for plate tectonics and the puzzle the students had just completed. Checks for understanding, as well as more body movements were added to aid in student engagement (Fig. 2). Inquiry based instruction was heavily utilized to help guide students to answers. However, at times (because they are 2nd graders) it became difficult to guide the intended geologic conversation. Hence, additional instructions were necessary to help the students reach the correct answers.

CONCLUSION

Overall, this lesson provided students with a deeper understanding of Earth history, especially related to plate tectonics, as well as a better understanding of how the Earth is shaped today. Students also gained an understanding of the importance of evidence in science to support ideas and the process of scientific reasoning . They also had fun!

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