Introduction

There is a growing emphasis in education to incorporate as much children’s literature as possible into lesson plans. The idea behind this is not just that it will promote literacy, but that it will engage students and provide them with a meaningful context to apply the knowledge from the lesson. For a lesson dealing with earth science, the National Science Teachers Association recommends various science trade books every year which can be viewed at www.nsta.org. One particular book on their list is *Plate Tectonics*, by Rebecca L. Johnson (2006).

Assessment of Science Tradebook

The premise of *Plate Tectonics* is how the theory behind plate tectonics has answered many puzzling questions scientists have always had, such as how fossils of fish could be found at the top of a mountain, especially one in Antarctica where everything is frozen. Each chapter delves deeper into the subject in a succinct manner. The first chapter, for example, explains how the scientists were puzzled about things they were finding, such as similar fossils on different continents. The next few chapters trace the progression of the plate tectonics theory, starting with how scientists began to think about the evidence they were collecting and then devised hypotheses to explain their strange findings. Chapter 5 explains how enough evidence emerged to change Wegener’s hypothesis into a theory.

*Plate Tectonics*, written for as young as third and fourth grade students, can easily be applied to some of the Grade Level Content Expectations for teaching Science, set by the Michigan Department of Education (MDE) for those grades. Some examples would be: “S.IA.03.12: Share ideas about science through purposeful conversation in collaborative groups” (MDE, 2004: p. 31); and “E.ST.04.31: Explain how fossils provide evidence of the history of the
Teaching about Plate Tectonics with a Science Tradebook 2

Earth” (MDE, 2004, p.47). I believe, though, that the book would be most useful when applied to the Grade Level Content Expectations for teaching Science to sixth grade students. The specific standards that could be applied are:

“S.RS.06.15 Demonstrate scientific concepts through various illustrations, performances, models, exhibits, and activities” (MDE, 2004, p. 65).

“E.ST.06.31 Explain how rocks and fossils are used to understand the age and geological history of the Earth (timelines and relative dating, rock layers)” (MDE, 2004, p. 69).

“E.ST.06.41 Explain how Earth processes (erosion, mountain building, and glacier movement) are used for the measurement of geologic time through observing rock layers” (MDE, 2004, p. 70).

“E.SE.06.51 Explain plate tectonic movement and how the lithospheric plates move centimeters each year” (MDE, 2004, p. 69).

“E.SE.06.52 Demonstrate how major geological events (earthquakes, volcanic eruptions, mountain building) result from these plate motions” (MDE, 2004, p. 69).

In order to meet the Grade Level Content Expectations for teaching Science to sixth grade students, Plate Tectonics could be incorporated into a lesson plan that intersperses reading with engaging activities. Below is a sample lesson plan that encompasses a pre-reading activity to introduce the topic, a mid-reading activity to explore the concepts, and a post-reading activity to strengthen understanding of the concepts.
Sample Lesson Plan

Pre-reading activity:

Provide each student with a pre-made folded mountain, made of four layers of different colored clay that have plastic fish fossils hidden between the layers (plastic fossils can be purchased at various stores online). The folded mountains should already have the top cut off, but placed back on top of the base. Instruct the students to think about what types of conditions wear away land. After several answers, instruct the students to take off the top layer of their mountain and observe the inner layers. Instruct students to come up with some explanations on how the fish fossils got on top of the mountain. (O’Brien-Palmer, 2002, p. 54-55).

Reading activity:

Read the first chapter to the students to make a connection with the puzzling finds the students had to the puzzling finds that real scientists had. Read the second chapter and briefly discuss continental drifting. Then read the third chapter and fourth chapter to introduce the topic of tectonic plates.

Mid-reading activity:

Prior to reading the fifth chapter, give each of the students a clear plastic container with molasses poured inside, along with a few graham crackers to break up and float on top of the molasses. Instruct students to come up with some thoughts on how the graham crackers floating on top of the molasses is like plate tectonics sliding past, colliding into, and moving away from each other on top of Earth’s hot mantle. (O’Brien-Palmer, 2002, p. 24-25).
Reading activity:

Finish reading the fifth and sixth chapters which show how the hypothesis of continental drifting became a theory with the new evidence that plate tectonics brought into the picture.

Post-reading activity:

Instruct the students that the next activity will be to recreate the folded mountain from the pre-reading activity. First, have them make clay layers of land, with plastic fish fossils between each layer. Next, have the students push the layered clay inward so that it moves up in the center like a folded mountain. Afterwards, discuss how their hands represented plates converging and forming one type of mountain. Then, recap on the main points of how that type of mountain was formed; how the fish fossils managed to get to the top of the mountain; and the ways that tectonic plates can move. (O’Brien-Palmer, 2002, p. 32-36).

Evaluation

My overall impression of the book was neutral; I neither adored it, nor loathed it. The positive aspects of the book were that it was straight to the point on the topic and it was divided into manageable chapters. The negative aspect of the book was that it lacked the “wow” factor. It did not stand out in a way that I would consider it a “must-have” in my classroom. The illustrations were helpful but not engaging enough as one would expect, especially if recommended by the National Science Teachers Association.
Conclusion

In conclusion, this book could be seen as beneficial in demonstrating how scientists approach findings that puzzle them and how hypotheses become theories. In terms of content, the book can be utilized effectively to implement engaging activities that will meet state-developed Grade Level Content Expectations and provide a meaningful context to apply the knowledge. Using tradebooks as part of a lesson is essential. Because my background as a teacher will be in Language Arts, Learning Disabilities, and English as a Second Language, I can see the value of using children’s language as part of every lesson, not just for teaching science. Even though the book lacked the “wow” factor, it could still be incorporated into an engaging lesson, thus making it a valuable tool.
Works Cited

