A lesson learned: Integrating literature into the content areas

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Abstract
In schools, students are offered numerous facts and ideas about the world in which they live, in hopes that they will one day become knowledgeable and functional members of society. Students are expected not only to take this information in, but to also make it their own, expand on it, and be able to apply it to situations within their lives. Teachers struggle to share this information through the most efficient and enjoyable mediums possible. How can they achieve the greatest understanding and interest among the greatest number of children?

“Children's literature is a powerful medium for understanding the world” (Diakiw, 1990, p. 297). Created to amuse or educate, this mass of printed material for young people is becoming much more prevalent as a means of instruction in the classroom. Literature encompasses both narrative and expository trade books, books that are found in a library or bookstore, as well as songs and poems. They are different from textbooks, books used specifically for learning in school, and, therefore, have different strengths and weaknesses. Students benefit vastly from the integration of literature into the math, science, and social studies curriculum.

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A Lesson Learned:
Integrating Literature into the Content Areas

by

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Introduction

In schools, students are offered numerous facts and ideas about the world in which they live, in hopes that they will one day become knowledgeable and functional members of society. Students are expected not only to take this information in, but to also make it their own, expand on it, and be able to apply it to situations within their lives. Teachers struggle to share this information through the most efficient and enjoyable mediums possible. How can they achieve the greatest understanding and interest among the greatest number of children?

“Children’s literature is a powerful medium for understanding the world” (Diakiw, 1990, p. 297). Created to amuse or educate, this mass of printed material for young people is becoming much more prevalent as a means of instruction in the classroom. Literature encompasses both narrative and expository trade books, books that are found in a library or bookstore, as well as songs and poems. They are different from textbooks, books used specifically for learning in school, and, therefore, have different strengths and weaknesses. Students benefit vastly from the integration of literature into the math, science, and social studies curriculum.
Rationale

“How would you rather study the rock cycle: by reading a textbook written in 1979, or by traveling to the center of the earth aboard Ms. Frizzle’s Magic School Bus” (Cerullo, 1997, p. 2)? The answer most children are likely to choose is quite obvious. Children’s literature adds excitement to learning, an intricate ingredient that other forms of instruction tend to leave out. It provides multiple perspectives and allows students to evaluate which are correct. Literature offers students experiences where they can learn about tolerance and empathy, in addition to the facts and figures printed on the pages.

In a world of infinite information, where educators vie for teaching time and test preparation takes precedence, where achievement standards are put into place but students are still falling behind, the use of children’s literature makes sense. Teachers can use literature to teach concepts in much more detail—saving time by relating them to other subjects and increasing motivation by relating them to students’ lives. Literature is also more accessible to different learning abilities and styles than the one-size-fits-all textbook.

Stories and other types of literature provide students with a natural and familiar medium through which to learn. They are a worthwhile teaching tool for the content areas in countless ways. After all, “There have always been stories, even in the earliest of times…it is through stories that we make and share meaning; it is the way we come to know and understand our world. It was that way then, and it is that way now” (Whitin & Wilde, 1995, p. ix).
Review of Research

Integrating Literature with Mathematics

The National Council of Teachers of Mathematics (1989) has described a mathematics curriculum that involves students in communicating mathematically, relating and applying ideas to real life, and cultivating an interest in the subject. Literature provides students with these beneficial experiences, as well as a multitude of others (Alvermann, Swafford, Montero, 2004; Daisey, 1994; Griffiths & Clyne, 1988; Halsey, 2005; Hellwig, Monroe, Jacobs, 2000; Hunsader, 2004; Kliman, 1993; Moyer, 2000; Schiro, 1997; Whitin & Wilde, 1995). Since abilities necessary for English and mathematics are similar, this integration enables students to hone skills necessary for both subjects simultaneously (Hellwig et al., 2000; Hunsader, 2004). Songs, according to Church (2001), display aspects of mathematics such as patterns, order, and matching through verses, refrains, rhythms, and tones. Griffiths and Clyne (1988) have further explained how such seemingly divergent areas are, in actuality, very much alike:

One function of mathematics is to order the world around us. So does literature. Mathematics is concerned with classification. So is literature. Mathematics is concerned with problem solving. So is literature. Mathematics looks at relationships. So does literature. Mathematics involves patterns. So does literature. And mathematics and literature both have aesthetic appeal. Without taking this analogy too far, we contend that mathematics and literature have strong links, both in content and structure, and that these links should be explored to make more effective the understanding of both mathematics and literature. (p. 4)
This idea has been emphasized by Moyer (2000), who has concluded that the division of mathematics and language is unnatural for students.

**Mathematics and Language.** Language is, in fact, how most students learn mathematics (Griffiths & Clyne, 1988; Halsey, 2005; Hellwig et al., 2000; Hunsader, 2004; Moyer, 2000), though communicating mathematically proves a struggle for some (Griffiths & Clyne, 1988; Moyer, 2000). Hunsader (2004) has found that, while literature can help remedy this problem, it is often discounted due to its variance from familiar arithmetical forms. When taken advantage of, however, literature offers students exposure to mathematical language as they read and discuss concepts after reading (Griffiths & Clyne, 1988; Hunsader, 2004). This aids in language development, which allows students to effectively form and communicate ideas in math and other subjects (Hellwig et al., 2000).

Whitin and Wilde (1995) illustrated this point with the trade book *The King’s Chessboard* (Birch, 1993). Once the story was read and the concept of continued doubling learned, students asked their parents for a meager, incessantly doubling, allowance (Whitin & Wilde, 1995). Whitin’s implementation of this activity bestowed him with student letters recounting experiences and sharing new enthusiasm for math.

**Real World Contexts.** Educators (Hunsader, 2004; Kliman, 1993; Whitin and Wilde, 1995) have suggested that exchanges such as this allow students to recognize the relationship between abstract math concepts and everyday life. Children’s literature makes them possible (Whitin & Wilde, 1992). With connections and appropriate support (Whitin & Wilde, 1995), students can learn more about math concepts and their significance (Hunsader, 2004; Moyer, 2000).
Moyer (2000) has affirmed that order is brought to the world through literature, which is an innate part of mathematics. Books such as *How Much is a Million* (Schwartz, 1994), for example, allow students to see math concepts in a tangible way (Whitin & Wilde, 1992) and connect new learning to their existing schema (Hellwig et al., 2000). In addition to aiding in understanding, literature encourages readers to take their learning of mathematics further by considering personal connections, creating math stories (Whitin & Wilde, 1995), and continuing investigations (Whitin & Wilde, 1992).

Literature provides children with meaningful problems and possible strategies for solving them (National Council of Teachers of Mathematics, 1989). Moyer (2000) has referenced *The Doorbell Rang* (Hutchins, 1989), which makes use of language to alter a mathematical problem. The story demonstrates that problems in real life tend to be more complex than those shown in textbooks (Moyer, 2000). They are not merely facts to be methodically memorized or questions with a single answer (Hellwig et al., 2000); they are dynamic conditions that must be worked through to find the best possible solution (Moyer, 2000).

Literature, Whitin and Wilde (1995) have added, allows students to critically consider problems and possible solutions before accepting numerical data. Manipulatives are an effective way to exhibit story happenings and compel students to think about them (Moyer, 2000). According to Kliman (1993), role play can also encourage critical thinking by placing students within stories where they must consider and solve problems.

**Selecting Quality Literature.** To avoid causing a problem of their own, teachers must ensure that instructional resources are of good quality (Halsey, 2005). Books must be well-written, developing math concepts clearly (Halsey, 2005) and naturally (Hellwig
et al., 2000; Moyer, 2000). Halsey (2005) has warned that, even when receiving suggestions from other sources, educators must use careful judgment.

Publishers of mathematics curriculum should be expected to suggest only the most appropriate and highest quality literature, but Hunsader (2004) has found that this may not be assumed. Those who write about children’s literature for mathematics feel that 40% of these books are outstanding, while experts feel this is a deserved term for only 2% (Schiro, 1997). In response to this, Schiro (1997) and other educators have devised and utilized formulated standards for determining quality. The mathematics standards include accurate and relevant content, clear and appropriate presentation, and involvement in mathematics (Schiro, 1997).

Utilizing an altered form of Schiro’s (1997) standards, Hunsader (2004) examined trade books recommended by two textbook publishers. She found that approximately half of the trade books scored high enough to be considered quality in both mathematics and literature. Halsey (2005) completed a similar investigation using Schiro’s (1997) assessment instrument, three textbook publishers, and suggested trade books. Unfortunately, her results echoed Hunsader’s (2004) findings.

Several of the trade books in this study did not successfully portray or develop math concepts (Hasley, 2005). Knowing which textbook chapters the literature was to correspond with did not help in determining the purpose of most trade books (Halsey, 2005). In contrast, this author found that some of the recommended trade books, such as *The Doorbell Rang* (Hutchings, 1989) *Grandfather Tang’s Story* (Tompert, 1997), and *The Greedy Triangle* (Burns, 1995) scored excellent in most or all of the eleven standards used to critique them.
Hunsader (2004) has reprimanded textbook publishers, feeling that they have neglected their responsibility to provide quality educational literature. She and Hellwig et al. (2000) have assumed that much of the inadequate, yet highly ranked, literature is made up of textbooks disguised as trades. When literature contains mistakes, students may find and fix them, reinforcing correctness and the evaluation of sources (Hellwig et al., 2000).

While Hellwig et al. (2000) has proposed that literature with errors may still benefit students, Hunsader (2004) has voiced a different opinion. She has cautioned that, when literature of poor quality is used for math instruction, both teachers and students are at risk of rejecting the idea of integration altogether. Schiro’s (1997) standards are, though slightly subjective, an effective way to evaluate texts and prevent this from happening (Hunsader, 2004).

**Integrating Literature with Science**

Many educators have suggested that science, too, may be enhanced through the use of literature (Cerullo, 1997; Crook & Lehman, 1990; Daisey, 1994; Gee & Olson, 1992; Janke & Norton, 1983; Madrazo, 1997; Podendorf, 1973; Rice, 2002; Simon, 1982). According to Abisdris and Casuga (2001), the devices present in literature, especially poetry, mirror the figurative aspects of science. The careful examining of scientific poetry allows students to benefit from this language, and to better understand concepts and contributions in the field (Abisdris & Casuga, 2001).

Science trade books answer specific questions and allow students to work at their own pace, while providing them with opportunities to think critically and gain interest in science concepts (Madrazo, 1997; Simon, 1982). Cerullo (1997) has expressed that
students achieve a greater understanding of the science discipline through literature, recognizing that its truths are constantly changing and never fully understood. Goldberg (1991) and Simon (1991) have supported this statement, asserting that science instruction should encourage students to think critically and ask questions. Children’s literature, they have concluded, promotes an appropriate study of science.

**Affective Science.** The learning of science should also lead students to recognize Earth’s complexities and reflect upon them (Goldberg, 1991). “Young children are interested in dinosaurs,” she has explained, “but they do not mourn their passing” (p. 33). Lauber (1991) has maintained that the science discipline is taught with moral neutrality. This, she has rationalized, is due to the intellectual approach through which it is presented.

Affective learners, such as women and minorities, are at a disadvantage because of this attitude (Rice, 2002). Instruction, Rice (2002) has continued, should expose students to both the cognitive and emotional aspects of science. Music (Diamantes, Young, & McBee, 2002) and other forms of literature make this possible (Cerullo, 1997; Crook & Lehman, 1990; Rice, 2002; Vacca & Vacca, 1999), though not to their potential (Goldberg, 1991). While scientists must be impartial in collecting their data, an interest in conclusions concerning life on Earth should be present and promoted (Lauber, 1991).

Both fiction and nonfiction literature utilized at the elementary level should invite imaginative thinking (Janke & Northon, 1983; Rutherford, 1991). Pringle (1991) has cautioned that both textbooks and trade books may eliminate the inquisitiveness that is essential for studying science. If students assume they will be provided with the information they need, they are left with no reason to contemplate ideas and work
through investigations of their own (Cobb, 1991). Rutherford (1991), however, has reassured that when science instruction is executed with both literature and creative problem solving, students benefit from it.

**Real World Contexts.** Sources (Cerullo, 1997; Kralina, 1993; Rutherford, 1991) have stated that science learning is more attainable when students can relate to the content. When students link science issues to their world, they gain better insight, appreciation, and responsibility for them (Cerullo, 1997). These ties, available through literature, also build background knowledge and improve comprehension (Rice, 2002). While current education trends are based on students linking new information to old (Duschl, 1990), Rutherford (1991) has insisted that building a base for future learning should not be their sole objective:

> Our schools all too often treat the childhood years not as a treasure but only as a promissory note to be cashed in for benefits later: Learn this now and it will help you later—next year, in high school, in college, in your job, some day…the purpose of learning, and schooling, and books is not just to prepare a child for something else, later on, but also—and of equal importance—to help him or her understand and enjoy what he is doing here and now. (p. 21-22)

Students must take an active part in their learning, uncovering through literature the wonders of science, the contributions of scientists, and the scientists in themselves (Cerullo, 1997; Daisey, 1994).

**Improving on Textbooks.** According to Cerullo (1997), since literature delves deeper and into fewer topics than textbooks, it has a better chance of tapping background knowledge and motivating students to read. “Today’s young people, raised in a visually
rich culture of television and video games, aren’t easily engaged by dry textbooks.

Today’s science trade books, with their lively texts and dramatic photos or paintings, lure young explorers into their pages” (Cerullo, 1997, p. 2).

In addition to securing student interest, (Blough, 1973; Cerullo, 1997), trade books provide relief for students who struggle with the breadth (Lamartino, 1995; Tyson & Woodward, 1989) and terms (Casteel & Isom, 1994) of textbooks. Some science textbooks have, in response to these issues, adjusted themselves to more closely resemble trade books (Walpole, 1999). Due to the regularity with which they are published, however, trade books and other forms of science literature remain more current than textbooks in both presentation and content (Crooks & Lehman, 1990).

Limitations and Misconceptions. While documented studies have shown literature as a capable teaching medium, they have not shown it to be better than the science textbook (Rice, Dudley, Williams, 2001). This, and the limited amount of research that exists, makes for educators uneasy in the execution of science literature (Rice et al., 2001). According to Eggerton (1996), some teachers feel that nonfiction prevents necessary creativity and intrigue, promoting the use of fiction instead. Others, she has continued, dislike fiction for its depictions of animals and nature. Hunter, Crismore, and Pearson (1987) have asserted that dependence on stories for science instruction puts students at a disadvantage in learning science terms and adjusting to expository science texts (as cited in Donovan & Smolkin, 2002). Donovan and Smolkin (2002) have added that stories do not provide students with as much content as they could receive from expository books. Some children’s literature even conflicts with science instruction (Mayer, 1995).
Misinterpretations may be formed through a trade book’s text, illustrations, or both (Mayer, 1995). For example, in *The Reason for a Flower* (Helen, 1983), a mushroom (fungus) is pictured as a plant, and in *Bugs* (Parker and Wright, 1987), a slug (mollusk) is classified as a bug (Rice, 2002). While it is assumed that these misconceptions will be fixed in time (Johnston, 1991, as cited in Rice, 2002), it is not guaranteed (Rice et al., 2001). Duschl (1990) has gone on to say that misconceptions often affect the intake of new information, leading to an incorrect understanding or preventing understanding altogether. This results in adults ignorant of science concepts (Rice, 2002).

Rice (2002) has reported that student learning mirrors trade book information, whether it is accurate or erroneous. If several sources are available, however, students are likely to separate fact from fiction (Blough, 1973). While some misconceptions may be acquired through trade books, Cerullo (1997) has suggested that others may be rectified.

**Selecting Quality Literature.** Errors are a looming possibility, even when authors put much thought and research into their books (Bosma & Guth, 1995). Mayer (1995) has revealed that flawed facts and figures are often present in literature recommended for science instruction. Content, namely accuracy and complexity, must be evaluated before these resources are used in the classroom (Donovan & Smolkin, 2002).

“With so many teachers reporting that they have little confidence in their knowledge of science concepts, using texts in which there is a high probability of incorrect information (that may go unnoticed) is problematic (Donovan & Smolkin, 2002,
Baker and Saul (1994) have reported that many teachers at the elementary level do not exercise caution when choosing literature for use in science instruction (as cited in Rice, 2002). Too often, they assume information is correct and use literature without considering the consequences (Rice, 2002).

Fortunately, several resources exist to aid interested educators in their search for high-quality science literature (Rice, 2002). One such source is the National Science Teachers Association’s yearly “Outstanding Science Trade Books” section in Science and Children (Madrazo, 1997; Mayer, 1995; Simon, 1982). The National Science Teachers Association has judged that the evaluation of science literature should be based primarily upon content and presentation (http://www.nsta.org/ostbc).

Janke and Norton (1983) have mentioned that another set of standards, by the American Association for the Advancement of Science, could be helpful to teachers. According to its website, the American Association for the Advancement of Science has supported books that are accurate, appropriate, and interesting (http://www.sbsonline.com/bestlists.htm).

**Integrating Literature with Social Studies**

Similar to mathematics and science, sources have advocated the integration of literature with social studies (Beck & McKeown, 1991; Diakiw, 1990; Farris & Fuhler, 1994; Graves, 1999; Kincade & Pruitt, 1996; Krey, 1998; McGowan & Guzzetti, 1991; Palmer, Davis, & Smith, 1992). Krey (1998) and McGowan and Guzzetti (1991) have defended the use of both fictional and factual trade books, indicating that they help students learn about and appreciate social studies content. “Because it is not possible for
any student to live in all of the times and places of human experience, literature can be the vehicle to transport learners into other cultures, places and eras” (Krey, 1998, p. 10).

Diamantes, et al. (2002) have rationalized the use of music for social studies instruction, discerning that all peoples have been fostered by this form of literature. It is an especially appropriate tool, they have found, for sharing customs and cultures. Poetry can also make a valuable addition to this subject, whether in introduction, study, or review (Ginocchio, 1987). Fordham, Wellman, and Sandmann (2002) have promoted literature for the learning it initiates, the genuine experience it offers, and the modern themes it communicates.

**Real World Contexts.** A genuine human experience, Graves (1999) has affirmed, should be the basis for learning social studies. This can be accomplished through literature, and allows students to make meaningful connections between information and their lives (Beck & McKeown, 1991; Kincade and Pruitt, 1996; McGowan & Guzzetti, 1991). School does not always prepare students to make decisions or think critically about the world in which they live (McGowan & Guzzetti, 1991).

To resolve this problem, educators (Beck & McKeown, 1991; McGowan & Guzzetti, 1991) have suggested that trade books be added to the curriculum to encourage multiple perspectives and reflection. Can’t you Make them Behave, King George? (Fritz, 1977) provides students with a view of “taxation without representation” that they do not receive from their textbooks (Beck & McKeown, 1991). These discrepancies force readers to make decisions and establish value systems of their own (Beck & McKeown, 1991).
Sources (Graves, 1999; McCall, 2004; Vacca & Vacca, 1999) have indicated that poetry also offers differing viewpoints and brings abstract ideas to life. This, they have imparted, helps students to better understand social studies concepts and to contemplate social concerns. Once students have grasped the information, they may be encouraged to discuss personal opinions, as well as the possible biases and intentions of the authors (McCall, 2004).

According to Beck and McKeown (1991), literature allows students to see the causes and effects of events. This, they continue, helps students tap into prior knowledge and connect it to new ideas. When students can relate to the occurrences they are learning about, they gain insight into how and why these events took place (McGowan & Guzzetti, 1991), and experience the trials and triumphs of people who lived through them (Combs & Beach, 1994). This, Krey (1998) has explained, provides a more complete picture of what is being studied. If students recognize that history impacts their lives, they will get more from it, in both comprehension and enjoyment (Graves, 1999).

**Affective Social Studies.** “Without an emotional attachment to learning, lasting learning simply doesn’t happen” (Graves, 1999, p. 116). Literature can trigger interest, enthusiasm, and empathy, regardless of age, gender, or race (Bosma & Guth, 1995). This leads to students who want to learn more about the past and are able to enter it with open minds (Farris & Fuhler, 1994; Krey, 1998). Many issues in social studies are difficult to discuss with students, but through the use of trade books, these ideas can be communicated in a comfortable and honest fashion (Bosma & Guth, 1995; Diakiw, 1990; Farris & Fuhler, 1994).
Racism is dealt with directly in *Roll of Thunder, Hear my Cry* (Taylor, 1978), forcing students to feel the pain of characters and face the injustices that occur in our world (Palmer et al., 1992). Fordham et al. (2002) have brought *Pink and Say* (Polacco, 1994) into the same light, comparing two friends—one white and one black—fighting in the Civil War. With its themes of friendship, bravery, and prejudice, readers are able to affectively connect with the book’s characters and situations (Fordham et al., 2002).

**Improving on Textbooks.** Delicate concepts and issues that are affective in origin are usually avoided by textbooks (Tyson & Woodward, 1989). According to these authors, the lack of controversial topics and the consolidation of superficial information supplied leads to confusion and misunderstanding. It is hard for students to learn when they are refused this essential background information (Kincade & Pruitt, 1996).

Beck and McKeown (1991) have found that social studies textbooks assume students know more about topics than they actually do, and that they are familiar with textbook structure. As a result, students may have trouble reading, comprehending, and linking prior knowledge to these obscure text types (Kincade & Pruitt, 1996). McGowan and Guzzetti (1991) have expressed that social studies literature portrays history in a style that is more comprehensible and appealing than the format textbooks use.

**Selecting Quality Literature.** According to McGowan and Guzzetti (1991), teachers must utilize quality resources in order to take full advantage of literature. Librarians and published sources, they have suggested, can help educators choose literature for lessons in less time and with added confidence. Journals with such recommendations include October issues of the International Reading Association’s *The Reading Teacher*, which offers suggestions for other content areas, as well, and April
issues of the National Council for the Social Studies’ *Social Education* (McGowan & Guzzetti, 1991). The quality literature listed in *Social Education* includes a large variety of text types and is largely based on the ideas presented and how they are shared (http://www.socialstudies.org/resources/notable/).

Krey (1998) has insisted that quality trade books must be accurate, engaging, well-written, developmentally appropriate, free of stereotypes, supported by visuals, and able to expand student knowledge. Farris and Fuhler (1994), like McGowan and Guzzetti (1991), have recommended *The Reading Teacher* as a resource, and suggested the American Library Association’s *Booklinks*, as well.

**Learning with Integrated Literature**

**Comprehension.** Combs and Beach (1994) have cited Smith (1988) in remarking, “The knowledge that we store in the brain as part of our theory of the world is largely in the form of stories, which are far more easily remembered and recalled than sequences of unrelated facts” (p. 464). They have ascertained that this is because people care about situations they can envision themselves in. Literature allows students to do this (Combs & Beach, 1994), making it a beneficial addition to curriculum (Bosma & Guth, 1995).

Literature, according to Vacca and Vacca (1999), enables readers to understand content in ways that textbooks do not. It allows students to comprehend and retain information in a developmentally appropriate fashion (Butzow and Butzow, 2000). When students must memorize facts, the rhyme, rhythm, and repetition of music provides an easy and engaging vehicle (Maute, 1987, as cited in Palmer & Burroughs, 2002).
Poetry, Cullinan and Galda (1981) have reported, provides a similar way to learn and remember curriculum content.

Students are permitted to learn, relate to information, and enjoy the experience through the personal role literature assumes (Vacca & Vacca, 1999). As students read, Gee and Olson (1992) have imparted, they should be encouraged to visualize events in their lives that can be related to the material. When shared, these memories reinforce the connecting of new and old information and may provide a base for students without prior knowledge on the topic (Gee & Olson, 1992).

**Critical Thinking.** Expository and narrative texts provide students with opportunities to learn new information, evaluate it, compare it to other sources, and connect it to life experience (Cullinan & Galda, 1981). This, Cullinan and Galda (1981) have suggested, enables them to filter fictional material and challenge literature they feel is inaccurate. Students begin reading analytically when they are provided with several sources and told to find discrepancies (Casteel & Isom, 1994; Vacca & Vacca, 1999). Students, Blough (1973) has pointed out, are likely to find information in one book that conflicts with that in another. They may then contemplate differences, evaluate the sources, and form their own conclusions (Blough, 1973).

According to Bosma and Guth (1995), this type of investigation forces students to consider the information they receive, rather than assuming it is fact. It also leads to the consideration of multiple perspectives and issues surrounding content (Bosma & Guth, 1995). When students discover the vast variety of information literature provides, they recognize the importance of reading it critically (Nordstrom, 1992, as cited in Rice, 2002).
**Literacy.** Simon (1982) has affirmed that the greatest pieces of literature are “those children read for pleasure but from which they learn without realizing they are being taught” (p. 6). When students read and interpret poetic text, they learn content, increase literacy, and develop a respect for different forms of written expression (MCall, 2004). The utilization of literature in the content area curriculum allows students gradual exposure to more demanding text types, which make up approximately half of what students read by fourth grade (Gee & Olson, 1992; Vacca & Vacca, 1999). It allows students to recognize that there are different purposes for reading and reading must be adjusted to fit them (Simon, 1982).

While informational text is deemed too difficult for the early grades, it is just as accessible as narrative text and should be included in instruction (Pappas, 1991, as cited in Alvermann et al., 2004). According to Vacca and Vacca (1999), the only exposure to informational material some students receive is the textbook, which will hinder them in finding information after finishing school. This is especially unfortunate since, according to the American Library Association (2002), students must be able to read and utilize informational texts to be deemed literate (as cited in Alvermann et al., 2004).

Using a variety of literature also shows children that authors write for many reasons, which may inspire them to communicate through writing, as well (Bosma & Guth, 1995; Cerullo, 1997). The integration of literature into the content areas can increase the amount of time children spend with text (Casteel & Isom, 1994; Cerullo, 1997; Daisey, 1994) and help to improve reading proficiency (Madrazo, 1997; Vacca & Vacca, 1999). Literature encourages students to take notes (Simon, 1982), value
literature in different fields of study (Madrazo, 1997), and see themselves as literate individuals (Bosma & Guth, 1995).

**Learning about Different Cultures.** We live in a diverse world (Cullinan & Galda, 1981). To take full advantage of this, children must be taught, from the elementary level on, to recognize and value all people (Diakiw, 1990; Evans, 1987). Sources have concluded that this lesson may be achieved through the use of literature (Diakiw, 1990; Kincade & Pruitt, 1996; Palmer et al., 1992).

Rudman (1976), however, found that children usually choose reading material that reflects their own cultures. Even when children do select multicultural literature, they focus on differences, rather than similarities (Lambert and Klineberg, 1967). This mindset can be changed (Evans, 1987) but, without direction, children may never develop a necessary respect and appreciation for others (Kincade & Pruitt, 1996). The responsibility of guiding children to adjust their attitudes rests, in part, with teachers (Palmer et al., 1992).

Children can relate other cultures to their own by comparing and contrasting them, building new information upon past experiences. *A Country Far Away* (Gray, 1988), for example, utilizes a split page layout to associate the lives of two boys from different civilizations as they take part in similar activities (Kincade & Pruitt, 1996). While reading this book and others like it, children discover that people, though different, share interests and universal needs (Bosma & Guth, 1995; Combs & Beach, 1994).

Stories and folktales demonstrate uniqueness of culture through style and language use, while common themes and morals show similarities (Kincade & Pruitt, 1996). Authors and illustrators portray cultures and the environments they originated
from in detail, allowing children to not only read about them, but to experience them as well (Kincade & Pruitt). Ethnic music, Miller and Brand (1983) have added, does the same.

“Literature addressing various cultures may offer opportunities for learners to examine geographic reasons for people’s actions and the historical background for attitudes” (Palmer et al., 1992, p. 231). Combining trade books with the textbook can enhance children’s knowledge of global education concepts (McGowan & Guzzetti, 1991) and different cultures (Bosma & Guth, 1995; Diakiw, 1990; Kincade & Pruitt, 1996; Palmer et al., 1992). “While the textbook provides the structure of a culture,” Kincade & Pruitt (1996) have expressed, “it is the trade books which provide a glimpse into its heart and mind” (pg. 8).

**Integrated Literature as a Bridge**

**Empowering Members of all Cultures.** Culture also demands attention in the classroom because it affects personal perspectives (Kincade & Pruitt, 1996; Whitin & Wilde, 1995). Perceptions, these authors have noted, often determine how information is interpreted. The combination of multicultural literature with instruction and discussion can help ensure that all students, regardless of background and views, succeed in their learning (Kincade & Pruitt, 1996).

According to Beane (1988), literature incorporates the affective and applicable aspects that women and minorities learn through (as cited in Rice, 2002). Some trade books stereotype science as disgusting, preventing some females from taking an interest in it (Ballou, 1986). Most literature, however, presents diverse populations in a positive
Integrating Literature

When students learn at a comfortable and capable rate, they learn more (Crook & Lehman, 1990). Unfortunately, McGowan and Guzzetti (1991) have reported that reading capabilities in a single classroom can range over four grade levels. A single textbook often leads to students who need more of a challenge and others who are unable to read essential material (Simon, 1982). Sources (Crook & Lehman, 1990; Gee & Olson, 1992; Madrazo, 1997; Podendorf, 1973; Simon, 1982) have endorsed literature as a vehicle to grant all students individually appropriate learning. It is also helpful, Madrazo (1997) has suggested, in adapting for different learning styles.

Literature assists students who learn best visually, by representing concepts through pictures (Guiett, 1999, as cited in Hunsader, 2004). According to Alvermann et al. (2004), children also find trade books less threatening because of their smaller size and reader-friendly format (Alvermann et al., 2004). These authors have maintained, “Once students step into a book, the illustrations, the way the print information is presented, and various access features encourage and support students as they move through books of their own volition” (p. 49).

Types of Books and Topics. Crook and Lehman (1990) have discerned that literature often shares difficult content in interesting and comprehensible ways. It transfers information, describes research and accomplishments of others, provides instruction for activities, and encourages students to conduct experiments of their own (Blough, 1973). Several types of text should be available to students (Blough, 1973),
who should be taught to utilize them correctly and for their appropriate purposes (Blough, 1973; Gee & Olson, 1992).

Widespread use of this teaching medium has resulted in the growth of nonfiction (Cullinan & Galda, 1981), fiction, and poetry (Casteel & Isom, 1994; Rice, 2002). This affords students recent literature (Moss, 1991; Rice, 2002; Tyson & Woodward, 1989) that is available for almost any subject (Cullinan & Galda, 1981) and age group (Daisey, 1994; Rice, 2002; Vacca & Vacca, 1999). These books, especially when compared with textbooks and encyclopedias, include much more detailed information (Cullinan & Galda, 1981) and tend to be focused on single ideas (Moss, 1991; Rice, 2002). Trade books are accessible to teachers, as well; the number and variety published allow for simple and obvious connections to curriculum (Podendorf, 1973).

**Motivation.** According to educators (Griffiths & Clyne, 1988; Palmer & Burroughs, 2002; Schiro, 1997; Whitin & Wilde, 1995), literature presents information in a way that is interesting and meaningful to students. When students are interested in what they are reading, they are likely to spend more time with the text (Daisey, 1994), allowing for additional exposure to the information presented. “When students are given opportunities to interact with quality trade books, a number of things happen. Perhaps the most important is that they have a better chance of becoming lifelong learners” (Vacca & Vacca, 1999, p. 91).

Perplexing textbooks, lacking personality and emotion, cannot promise the same (Vacca & Vacca, 1999). Dependence on textbooks causes students to lose interest in learning and their ability to use higher level thinking (Dunn, 2000, as cited in Alvermann et al., 2004). Luckily, nonfiction has evolved into a genre that is more subjective and less
literal that it once was, adding a sense of understanding and entertainment to its pages (Vacca & Vacca, 1999).

Literature motivates students to further study topics they are personally interested in (Bosma & Guth, 1995; Cerullo, 1997; Crook & Lehman, 1990) and challenge themselves (Hunsader, 2004). Alvermann et al. (2004) has indicated that, when it is paired with real world contexts, student engagement is almost certain. The appealing nature of these books helps to calm students’ learning anxieties so that they may concentrate on their learning (Hunsader, 2004; Whitin & Wilde, 1992). In addition to involving students in their learning, trade books can help them develop socially and increase their self-esteem (Kralina, 1993). Consulting literature can even help pique a teacher’s interest and spur understanding of difficult concepts (Crook & Lehman, 1990).
Classroom Implications

Research has noted literature as a medium through which students learn, but how do teachers effectively implement it? How does literature bridge gaps, spark learning, and accomplish everything else it is said to do? The following pieces of literature provide many of the benefits previously discussed. They all fit neatly into the curriculum, and may be used for a large variety of tasks.

In mathematics, *The Great Graph Contest* (Leedy, 2005) introduces several graph types through story. This book tells about two friends who use the objects around them to form graphs for a competition. Students can easily relate to the information, such as cookie types and bathing suit patterns, that is used to form these diagrams. The actual graphs are not only clearly illustrated and titled; they are also described in simple terms. As characters ponder their projects, readers can experience the initial thought process that goes into organizing data, as well as the success that comes with a finished product. The story is fun in plot and arrangement, with math concepts that are an integral part of the book.

Once students have interacted with this trade book, they might discuss similarities and differences among the graphs they learned about, and why specific graphs were chosen to display certain information. Students can examine and analyze diagrams to determine what they show and whether or not they present information in the best way possible. After extended exposure to graphs and how they work, students can use sets of data to create graphs of their own!

Greg Tang also organizes math concepts in a way that correlates with text and is easily understood. *Math Appeal* (Tang, 2003) encourages its readers to count creatively,
by using the operations of addition, subtraction, and multiplication. Playful riddles accompany clear illustrations and give readers hints on how to do the math within the pictures. Answers and explanations are provided in the back of the book. Students are actively engaged in this text, not only in their reading, but in doing mathematics, as well. This thinking outside the box is excellent for students who are more visual, creative, and concrete learners.

Making use of this book in the classroom is simple—students could write reactions to Greg Tang’s methods in their journals, reflecting on how Math Appeal (or another of his books) is set up, how it encourages readers to find the number of objects on each page, and whether or not this strategy works well for them. This lets students know that there are many ways to solve problems, and that different methods work best for different people. It also encourages them to think about what works best for them, which is something that can benefit them in math, other content areas, and life in general.

Math Curse (Scieszka, 1995) tells the story of a girl who is, for a day, put under a math curse. Everything around her turns into a problem (many of them quite humorous) that she must attempt to solve. Students reading this book realize that problems vary in difficulty and do not always possess possible answers. Readers relate to a day where everything that can go wrong does, and to the pressure of not being able to figure things out. They find fun in math, and math in their own lives. This lowers math anxiety and makes learning mathematics more meaningful to students.

After experiencing this piece of literature, students can go back and try to solve some of the problems presented throughout the story. Another option is having students research or practice a certain skill (unit conversions, graphing, fractions, etc.). They
might make lists of problems they have had to solve in their lives, and make up real-life math-related problems for their peers to solve. Students can even tie language arts to mathematics by creating stories with math problems integrated into them.

Marilyn Singer’s *On the Same Day in March: A Tour of the World’s Weather* (2000) introduces students to different types of weather. Through this book, readers get a glimpse into the lifestyles and environments of people in other areas of the world. These people are shown participating in everyday activities that students can relate to. The separate destinations are brought together in an end note from the author to illustrate why these weather patterns occur in these places, at this time.

Many students form misconceptions about how the placement of Earth and the sun affect temperature. This book can help students understand that it is not the distance between the earth and the sun that impacts temperature, but the tilt of the earth and what portion of it faces the sun. The angle of Earth’s axis is explained in this note, as is the fact that weather can vary a bit from what is expected and shown in this book.

For instructional purposes, students might fill out a KWL (Know, Want to know, and Learn) chart and use this after reading to discover what they have gained through the text. Activities about the tilt of earth’s axis may be performed prior to reading, or the book may serve as an introduction to the concept. Once students have a clear understanding of seasons, they can choose a month and research different countries to make their own weather tour books. This allows them to show, in groups, what they have learned and come to understand. Students may gain appreciation and respect for other cultures through this activity. A weather tour book can also be completed as a class, with
each student choosing a place and researching its environment, weather patterns, and culture for a specific month. Each place may then become part of a class book.

*The Magic School Bus Explores the Senses* (Cole, 1999) takes students on a tour of the eye, ear, nose, tongue, and skin, providing them with information about these body parts and how they function. It also makes the vital connection of the senses with nerves and the brain. This book may be used in whole or in part, for a multitude of purposes: to teach about all five senses, a specific sense, nerves, the brain, or the whole nervous system. Information about humans and animals is provided, making the book more flexible for instructional use. This book is packed with facts, but also includes fictional elements to help relate these facts in an interesting and unthreatening way. After the story, the author goes through fallacies in the book, preventing possible misconceptions, while making fun of the fact that they could occur.

Students may interact with this book at any point in instruction; it may be used to introduce, teach, or review. Since this book shows where information from the senses is stored in the brain, students can map their brains on paper to show where specific functions take place. This can be done before reading, as a prediction, or afterwards as part of an evaluation of student learning. Students can perform experiments and activities involving specific senses. They might, in groups, learn more about and present the five senses. Children may write about the most important things their senses allow them to do, and how their lives would be different without one of these senses. They might then perform activities, lacking the use of a sense or two. This allows students to gain empathy and recognize how people lacking certain senses might function.
*Telegraph Line* (Schoolhouse Rock, 1973) allows students to learn science concepts through song. The parts of the nervous system are discussed and made clear through examples that students can connect with their daily lives. One verse describes the realization that a hand is on a hot stove and the reaction that pulls it away. The song is one big metaphor—comparing the nervous system to a telegraph line (which may need to be defined for today’s students). It is quite catchy, and may help students comprehend and recall this information more easily.

Though it is best for students to have some background knowledge of the nervous system and its functions when listening, this song may be used before or after extended instruction. Students might fill out a worksheet to follow along and pick out important concepts; they may also discuss the song and examples of nervous system functions after the song has finished. Once students have learned about the nervous system in more detail, they can form their own “nervous systems” in groups. Students take turns being the brain, nerve cells, and other parts of the body. They draw cards with messages, send them to the correct body part, write responses to these messages, and send them to the appropriate body part. Another option is having students create comics about a function of the nervous system or what the nervous system might do in a certain situation.

*Ms. Frizzle’s Adventures: Ancient Egypt* (Cole, 2001) takes readers on an educational and insightful trip back in time. Students get a taste of many aspects of ancient Egyptian life—writing, dress, work, education, recreation, beliefs, and more. The culture is described and shown in a positive light that is clear and appropriate for students. Similar to the *Magic School Bus* series, fictional ideas are corrected at the end to avoid misconception.
After spending time with this book, students can discuss what they read in groups or as a class. Ancient Egypt may then be compared and contrasted with America today through Venn diagrams or another type of graphic organizer. Students can write about their own “trips” to ancient Egypt, including (and distinguishing between) fact and fiction. These may be shared with the class, put together into a class book of “Ancient Egypt Travels,” or acted out for the rest of the class. Students might also, independently or in groups, research and present different aspects of ancient Egyptian life.

Students learn about the Revolutionary War in school, but they often only get the colonists’ perspective. Can’t you Make them Behave, King George? (Fritz, 1977) allows students to recognize that England had reasons for its actions. This book tells the story of King George III—how he became king, his hopes for himself and his country, and the pressure he was put under to keep people happy. It presents history in a way that is comical, clear, and child-friendly.

Before reading this book, students might write down how they feel about King George and England at this time in history. After the book has been read, students can go back and write whether or not their view of him has changed. Students may also explain in their journals whether or not King George was a good king, and what he could have done to improve. Students may write about why it is important to get both sides of a story, or link this learning with their own lives by writing about a time in their life when they were misunderstood for doing something they thought was right. Students might place themselves in King George’s shoes and write a letter to the colonists. They may also role play (and feel the unfairness of) “taxation without representation,” using candy to represent money. Students act as King George, members of Parliament, tax collectors,
and colonists, with the colonists having to pay pieces of candy for each new “law” that is formed.

_No More! Stories and Songs of Slave Resistance_ (Rappaport, 2002) utilizes both powerful words and pictures to impact readers. While social studies texts sometimes avoid sensitive topics, this book deals with them head on. The injustices faced by African slaves are illustrated, as well as the strength, hope, and dignity they refused to give up. It is important for students to interact with this part of history, to understand and empathize what these people went through, and to help prevent anything like it from happening again.

After reading this book, students may do a number of things. Students can write reactions to the institution of slavery and the treatment of African Americans through poem, song, story, or reflection. They may write about what freedom means to them, and why it is so important that everyone possesses it. They may research and read about specific slaves to gain an even deeper understanding of the horrors African (and later, African Americans) faced. Students may also research and read about slave holders and other people who began and continued the institution of slavery. This could help students to see how quickly and easily people can be led to believe that something unjust and inhumane is acceptable, and the extents people will go to for money, pride, and power. It is also important for students to know that, while slavery was a terrible thing, not all people who took part in it realized this. After examining all of this information, and possibly comparing it to other cruel acts against humans (the Holocaust, for example) students could write about whether or not they believe something like this could happen again to a group of people.
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Children’s Literature References


Title: “Sensing the System”

Type: Direct

Topic: The nervous system, more specifically, senses and how they are related to the brain

Duration: One day, 45-60 min.

Purpose: Senses are used in everyday. It is important that students understand their significance and how they work. The senses provide people with all information from the outside world. This information is then transferred to the brain, which processes it and tells the body what to do. The nervous system and this process will be introduced through the senses in this lesson.


Michigan Standards/Benchmarks:
SCI.III.2.MS.4: Explain how selected systems and processes work together in animals.

Objectives: Students will identify the five senses and why they are important. Students will explain how the nervous system relates to the senses.
Students will show where information for each sense is stored in the brain.

**Assessment of Objectives:**
Students will be assessed on their completed “Map Your Brain” worksheets.

**Anticipatory Set:**
“Who knows I am sitting here? Who can tell I’m talking? How?”

Read *The Magic School Bus Explores the Senses*, telling students to pay extra attention to what the senses are, and what happens to the information gathered from them.

**Input:**
“What are the five senses?” (Student volunteers answer—seeing, hearing, smell, taste, feeling. Have other students repeat.)

“Why are they important? What do they tell us (give examples)?” (They tell us everything about outside world and are necessary for survival.)

“What happened to the information that was received through the senses in the story?” (It was sent through nerves to the brain.)

“What do you think happened to all of this information once it went to the brain?” (The brain sent a response and the body reacted.)

**Modeling:**
Show/tell students where senses take place in the brain (“eyes in the back of your head,” smell is farthest to the front, like your nose,” etc.).

**Checking for Understanding:**
Point to sense centers on head and ask students which sense’s information is stored there.

**Guided/Independent Practice:**
Students complete “Map your Brain” worksheet
Closure:

Review five senses and how important they are.

“We will continue to learn about the nervous system, and the brain in particular, next time.”

Adaptations:

Extra support, modified worksheets
Map Your Brain

Directions: Use the color key to color the parts of the brain where the senses take place. Then, label the parts by the senses that happen there.

Color Key
Red: Hearing
Orange: Sight
Yellow: Smell
Green: Taste
Blue: Touch
Ex: **Scratching a mosquito bite.** (This would be underlined in blue, since it involves touch.)

**Color Key**
- Red: Hearing
- Orange: Sight
- Yellow: Smell
- Green: Taste
- Blue: Touch

Recognizing your friend’s voice when he calls.

Deciding you like strawberry jelly better than grape.

Listening to your favorite song on the radio.

Choosing clothes that match in the morning.

Knowing your grandma is next to you by her perfume.

Reading this paper.

Getting hit in the head with a baseball bat.

Shivering when snow gets inside your glove.

Realizing the grass has been cut by the scent coming through the window.

Taking medicine you don’t like.

Biting your tongue.

Chewing a stick of gum.
Title:
“Because I Have a Brain”

Type:
Direct/Cooperative/Inquiry

Topic:
The brain and how it works

Duration:
One day, 45-60 min.

Purpose:
The brain is the control center of the human body. It allows people to think, move, do, and feel. It also allows people to improve on tasks, which is something people strive for continuously. Students should know how they get better at things, and why this is so. This lesson will discuss the brain’s parts and functions.

Materials:
“If I Only had a Brain” (Bolger & Garland, 1995) on cd, cd player, “If I Only had a Brain” lyrics, “Because I Have a Brain” fill-in-the-blank lyrics, “Your Beautiful Brain” PowerPoint, “Brain Beginnings” PowerPoint worksheet, computer, television, pencils, paper, “How Does Your Brain Learn?” worksheet (data table and questions), eight stopwatches/clock, brain (1.5 cups instant potato flakes, 2.5 cups hot water, 2 cups clean sand, 1 gallon ziplock bag), five sets of three identical: (long addition and subtraction problems, yarn tied in knots, lists of words to be alphabetized, mazes), five picture books (with sentences to be found in each)
Michigan Standards/Benchmarks:

SCI.III.4.EL.2: Explain how physical and behavioral characteristics of animals help them to survive in their environments.

SCI.I.1.EL.2: Develop solutions to problems through reasoning, observation, and investigations.

SCI.I.1.EL.6: Construct charts and graphs and prepare summaries of observations.

Objectives:

Students will draw and label the parts of the brain.

Students will conclude that the brain learns by doing.

Students will interpret data from “How the Brain Learns” experiment and compare it with the rest of the class.

Students will use teamwork to time each other and answer questions.

Assessment of Objectives:

Students will be assessed on their participation and their completed worksheets.

Anticipatory Set:

Students fill out “Because I Have a Brain” song lyric sheets.

Students listen to “If I Only had a Brain,” singing along to altered lyrics during the instrumental portion.

Input:

Go over brain PowerPoint, discussing important concepts (organ, functions, parts, hemispheres, protection).

Discuss brain model (same consistency, 3 lbs.) and pass it around.
Modeling:

“Learn from your mistakes. Practice makes perfect. Who has heard these statements before? Are they true? Let’s find out!”

Describe/give directions for experiment: Students will be placed in five groups. Each group is to perform a different task (untying knots, finding sentences in stories, solving math problems, completing mazes, and alphabetizing words). Every student in each group will perform their group’s task three times. Each group will first make a hypothesis, predicting how their times will change as they complete more trials. Group members will then take turns performing tasks and timing each other (each person should complete their three trials in a row) and recording their times. Once their trials are completed, students are to answer questions about the experiment. Each group’s data will be shared with the class, and students will be asked what happened and why.

Checking for Understanding:

“Tell your neighbor what you will be doing.”

Guided/Independent Practice:

Students complete experiments and gather data.

Class shares and discusses results.

“The brain learns by doing.”

Closure:

“We will be learning more about the brain tomorrow, and about why the brain learns by doing next week!”

Adaptations:

Extra support, students given tasks they are capable of, expectations aligned with abilities
“If I Only had a Brain”

*Wizard of Oz*

(Scarecrow)
I could wile away the hours
Conferrin' with the flowers
Consultin' with the rain
And my head I'd be scratchin'
While my thoughts were busy hatchin'
If I only had a brain

I'd unravel any riddle
For any individ'le
In trouble or in pain

(Dorothy)
With the thoughts you'd be thinkin'
You could be another Lincoln
If you only had a brain

(Scarecrow)
Oh, I would tell you why
The ocean's near the shore
I could think of things I never thunk before
And then I'd sit and think some more

I would not be just a nuffin'
My head all full of stuffin'
My heart all full of pain
I would dance and be merry
Life would be a ding-a-derry
If I only had a brain

(Scarecrow)
I could wile away the hours
Conferrin' with the flowers
Consultin' with the rain
And my head I'd be scratchin'
While my thoughts were busy hatchin'
If I only had a brain

I'd unravel any riddle
For any individ'le
In trouble or in pain
(Dorothy)
With the thoughts you'd be thinkin'
You could be another Lincoln
   If you only had a brain

(Scarecrow)
Oh, I would tell you why
The ocean's near the shore
I could think of things I never thunk before
And then I'd sit and think some more

I would not be just a nuffin'
My head all full of stuffin'
My heart all full of pain
I would dance and be merry
Life would be a ding-a-derry
   If I only had a brain
Because I Have a Brain

Directions: Fill in each blank with the correct sense word (hint: some blanks may have more than one right answer). Then, get ready to sing along!

I can __________ the phone a’ringin, and listen to you singin,
Because I have a brain.
I can __________ chocolate ice cream, and vanilla cake with icing,
All because I have a brain.

I can __________ the pretty flowers and burnt popcorn for hours,
Because I have a brain.
I can __________ the words on this page, and my mom when she’s in a rage,
All because I have a brain.

I can __________ that snow is falling, and __________ a poor car stallin,
Because I have a brain.
I can __________ my hand a’freezin and you bet I know the reason,
It’s because I have a brain.

Oh I can think, can you? Of five senses we use.
Tasting, smelling, hearing, feeling, seeing, too—
Info from the world to you.

___________ the words upon this white sheet, ________ pain, texture, and the heat,
Because you have a brain.
You couldn’t sing this song, now, aren’t you glad that you’ve got one?
Oh yes, you owe it to your brain!
Brain Beginnings

1. The brain is a(n) ______________________

2. In your own words, what does the brain do?

_____________________________________________________________________
_____________________________________________________________________
_____________________________________________________________________
_____________________________________________________________________

3. Draw the brain and label its three parts.

4. The largest part of the brain is the ____________________.

5. The cerebrum is divided into _______________________ parts.

6. Balance is controlled by the ___________________.

7. The brainstem connects the rest of the brain with the ______________________.

8. The brainstem controls _________________________ processes.

9. The brain is divided into the _____________ and _____________ hemispheres.

10. The brain is protected by the ____________________.
How Does Your Brain Learn?

Directions: First, form a hypothesis (tell what you think will happen). Next, perform your tasks (each person completes the task assigned to your group three times). ***DO ALL OF YOUR TRIALS IN A ROW~DO NOT SWITCH PEOPLE IN BETWEEN!!!*** Time each other, and write down how long (in seconds) it takes each person to complete each trial. Then, answer the questions on the back of this page. We will be discussing our results as a class afterwards, so be prepared to share your findings! You only need to turn in one sheet per group.

First, form your hypothesis (how do you think the times of your trials will differ?):

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1. What do you notice about your times?

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2. Why do you think this is?

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_________________________________________________________________

3. How does the brain learn?

_________________________________________________________________

_________________________________________________________________

_________________________________________________________________

_________________________________________________________________

4. How might this relate to school?

_________________________________________________________________

_________________________________________________________________

5. **EACH OF YOU** Describe a time in your life when something like this happened.

_________________________________________________________________

_________________________________________________________________

_________________________________________________________________

_________________________________________________________________

_________________________________________________________________

_________________________________________________________________
Title:
“Taking Sides”

Type:
Direct/Inquiry

Topic:
The brain is split up into two hemispheres that affect how we move and act.

Duration:
Two days, 40-50 min./15-20 min.

Purpose:
Students use their brain in everything they do, so they should have an understanding of how it works. This lesson will provide them with an idea of how the right and left hemispheres are different, why people sometimes act the way they do, and what can happen if there is injury to the brain.

Materials:
Oh, the Thinks you can Think (Geisel, 1975), completed brain preference quizzes, right/left characteristics score sheet, station signs, five pairs of balled up socks, five cardboard tubes, paper, radio, “Taking Sides” data sheet, “Taking Sides” question sheet, “Taking Sides” home question sheet, pencils/pens, white board, dry erase markers, “Right and Left Hemispheres” PowerPoint, computer, television

Michigan Standards/Benchmarks:
SCI.I.1.EL.2: Develop solutions to problems through reasoning, observation, and investigations.
SCI.III.2.MS.4: Explain how selected systems and processes work together in animals.
Day 1:

Objectives:

Students will hypothesize which brain type they are, based on their sidedness activity.

Students will compare and contrast their personality with the characteristics of their dominant brain type.

Students will conclude that dominant hemispheres are usually opposite of sidedness (though this is not always the case).

Assessment of Objectives:

Students will be assessed on their activity participation, their completed worksheets.

Anticipatory Set:

Read *Oh, the Thinks you can Think!*

Input:

“Think left and think right…how can we relate that to our brain?”

Everyone uses both sides of their brain, but people usually have one hemisphere that is used more than the other. People can be dominant in either their left hemisphere or right hemisphere.

Each side has different tasks it specializes in.

This was discovered through research with brain damaged patients.

Gives directions to students (which way to move around the classroom, the signal to move) and demonstrates activities.

Students perform activities, traveling to stations around the room. At these stations, students will test which side of their body they use for various activities [hopping on one
foot, writing their name, tossing and catching a balled up pair of socks, cupping their ears to listen to quiet music, and looking through a tube]).

**Modeling:**

Show students how to score their brain preference quizzes and fill out their worksheet, reviewing Venn diagrams.

**Checking for Understanding:**

Students fill out the first question on their “Taking Sides” question sheets.

Students score their right/left preference questionnaires.

Explains characteristics of each hemisphere (right: creative, left: logical) and asks students for real life examples.

**Guided/Independent Practice:**

Students fill out their “Taking Sides” question sheets and take “Taking Sides” data sheets to complete at home.

**Day 2:**

**Closure:**

Review key concepts with students using PowerPoint presentation. Remind them that they will be learning about how the brain receives all of this information in the following week.

**Adaptations:**

Extra support
Name: ______________________________________

**Right or Left Brained Quiz**

Directions: Choose the sentences that best describe you.

1. A It's fun to take risks.  
   B I have fun without taking risks.

2. A I look for new ways to do old jobs.  
   B When one way works well, I don't change it.

3. A I begin many jobs that I never finish.  
   B I finish a job before starting a new one.

4. A I use my imagination in everything I do.  
   B I'm not very imaginative in my work.

5. A I can sense what is going to happen next.  
   B I can analyze what is going to happen next.

6. A I try to find different answers to problems.  
   B I try to find the one best way to solve a problem.

7. A My thinking is like pictures going through my head.  
   B My thinking is like words going through my head.

8. A I agree with new ideas before other people do.  
   B I question new ideas more than other people do.
9. A Other people don't understand how I organize things.  
    B Other people think I organize well.

10. A I usually act on my feelings.  
     B I have good self-discipline.

11. A I don't think about the time when I work.  
     B I plan time for doing my work.

12. A With a hard decision, I choose what I feel is right.  
     B With a hard decision, I choose what I know is right.

13. A I do easy things first and important things later.  
     B I do the important things first and the easy things later.

14. A Sometimes in a new situation, I have too many ideas.  
     B Sometimes in a new situation, I don't have any ideas.

15. A I have to have a lot of change and variety in my life.  
     B I have to have an orderly and well-planned life.

16. A I know I'm right, even without good reasons.  
     B I know I'm right, because I have good reasons.

17. A I prefer to do my work at the last minute.  
     B I spread my work evenly over the time I have.

18. A Where I keep things depends on what I'm doing.  
     B I keep everything in a particular place.
19. A I have to make my own plans.
    B I can follow anyone's plans.

20. A I am a very flexible and unpredictable person.
    B I am a consistent and stable person.

21. A With a new task, I want to find my own way of doing it.
    B With a new task, I want to be told the best way to it.

To Score:
Give yourself one point for each time you answered “A.”
Add all points

0-4 strong left brain
5-8 moderate left brain
9-13 middle brain
14-16 moderate right brain
17-21 strong right brain

Preferences of the Two Sides of the Brain:
Description of the Left-Hemisphere Functions
    Keeps track of the order in which we do things
    Responsible for awareness of time, details, and order
    Responsible for processes involving hearing and speaking
    Specializes in words, logic (common sense), critical thinking, reading, and writing
    Responsible for boundaries and knowing right from wrong
    Knows and respects rules and deadlines

Description of the Right-Hemisphere Functions
    Tells us when someone is lying or making a joke
    Specializes in understanding the whole picture
    Specializes in music, art, visual-spatial and/or visual-motor activities
    Helps us form mental images when we read and/or talk
    Responsible for feelings and emotional responses.
    Helps us to form and continue relationships

Left vs. Right Brained:
    Thinks vs. Feels
    Words vs. Pictures
    Organized vs. Random
    Logical vs. Creative
    Set Plans vs. Change
Name: ______________________________

Taking Sides

Directions: Move station to station, completing the following activities. Pay attention to which side of your body you use, and write it down!

<table>
<thead>
<tr>
<th>Name of Activity</th>
<th>Side Used (Left or Right)</th>
</tr>
</thead>
<tbody>
<tr>
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</tbody>
</table>
Name: ______________________________

**Taking Sides**

Directions: Answer the following questions.

1. After completing the sidedness activities, which side of your brain do you think is dominant (used most often)? Why?

_____________________________________________________________________
_____________________________________________________________________

2. Score your right/left brain questionnaires.

   a. Which side of your brain is dominant?

      __________________________________________________________________

   b. Are you surprised by the results?

      __________________________________________________________________

   c. Do you agree with them?

      __________________________________________________________________

3. Compare and contrast yourself with the characteristics of your dominant brain. (If you are middle-brained, use: How the right brain is like you, which characteristics you think are equally right and left brained, and how the left brain is like you.)

<table>
<thead>
<tr>
<th>You</th>
<th>Both</th>
<th>Your dominant brain</th>
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<tbody>
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   ____________________________________________________________________

   ____________________________________________________________________

   ____________________________________________________________________

   ____________________________________________________________________
**Taking Sides**

Directions: Have a family member complete the following activities. Pay attention to which side of their body they use, and write it down (but don’t tell them what you’re doing until you’re done)!

<table>
<thead>
<tr>
<th>Name of Activity</th>
<th>Side Used (Left or Right)</th>
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</thead>
<tbody>
<tr>
<td>Drink out of a cup</td>
<td></td>
</tr>
<tr>
<td>Toss a ball</td>
<td></td>
</tr>
<tr>
<td>Wink</td>
<td></td>
</tr>
<tr>
<td>Hop on one foot</td>
<td></td>
</tr>
<tr>
<td>Write name</td>
<td></td>
</tr>
</tbody>
</table>

What do you think their dominant hemisphere is?  
______________________________________________

Can you be sure, only performing these activities, that this is your family member’s dominant hemisphere?  
________________________________________________________________________  
________________________________________________________________________
Title: “Got Nerve?”

Type: Direct

Topic: The parts and functions of nerve cells

Duration: One day, 45-60 minutes

Purpose: Students now know that information is taken in from the senses and passed to the brain, but they do not know how. Students will learn about nerve cells to understand how this process takes place in their bodies.


Michigan Standards/Benchmarks: SCI.III.2.MS.4: Explain how selected systems and processes work together in animals.

Objectives: Students will make models of neurons with pretzels and their own bodies. Students will identify the parts of a nerve cell. Students will describe what a synapse is. Students will show where a synapse takes place.
Students will distinguish why synapses are important.

**Assessment of Objectives:**

Students will be assessed based on their modeling and identifying parts of neurons with their bodies and synapses with their pretzels. Students will also be assessed on their worksheets.

**Anticipatory Set:**

Students make two nerve cell pretzels (one they will eat themselves, after baking, and one which will be donated to the staff of a nursing home).

**Input:**

Nerve cell PowerPoint, students fill out beginning of “Got Nerve?”

Read “My Universe” poem during pictures.

**Modeling:**

Show students, on the PowerPoint, the parts of a nerve cell and how information travels.

**Checking for Understanding:**

Ask students, if their hand was a neuron, what would be the soma/dendrites/axon?

**Guided/Independent Practice:**

Students show how a message would pass between their pretzels and their hands/arms.

**Closure:**

Review the fact that nerves send messages to and from the brain. Let students know they will be learning about the last part of the nervous system, the spinal cord, during their next session.

**Adaptations:**

Extra assistance
Got Nerve?

1. What do nerve cells/neurons do?

_____________________________________________________________________
_____________________________________________________________________

2. The _________________ is also called the cell body.

3. ______________________ take in information from other nerve cells.

4. The ____________________ sends information to other nerve cells.

5. Draw and label the three parts of a nerve cell.

6. The gap between nerve cells that information is passed through is the 
   ________________.

7. When you experience or learn something, your _________________ extend,
   which cause neurons to grow and connect.

8. This is why the brain learns by _________________!

9. What is a synapse?

_____________________________________________________________________
_____________________________________________________________________

10. Why are synapses important?

_____________________________________________________________________
_____________________________________________________________________
My Universe

Jennifer Harb

Lightning bolts shoot through my body.

Trees grow tall

And fireworks explode.

The one-eyed, one-horned, flying purple people eater is sharing its secrets.

Honey flows, but it wastes no time.

I hold the heavens in my head.
Title:
“Telegraph Line”

Type:
Direct/Cooperative (Culminating Activity)

Topic:
The nervous system and its smaller parts

Duration:
One day, 45-60 min.

Purpose:
Now that students have learned about the parts of the nervous system, it is time for them to gather their knowledge and see how these parts make the nervous system work!

Materials:
“Telegraph Line” (Schoolhouse Rock, 1998) song on cd, cd player, “Telegraph Line” lyrics, message sheets, pencils/pens, overhead projector, overhead markers

Michigan Standards/Benchmarks:
II.1.EL.2: Show how science concepts can be illustrated through creative expression such as language arts and fine arts.
III.2.MS.4: Explain how selected systems and processes work together in animals.

Objectives:
Students will explain how information travels through the nervous system.
Students will demonstrate how the nervous system works through role play.
Students will work together to send messages through their group’s “nervous system.”
Students will respect other students’ ideas.
Assessment of Objectives:

Students will be assessed based on their participation and written “Just a Thought” sheets.

Anticipatory Set:

Students listen to “Telegraph Line” and discuss the nervous system to review.

Input:

Introduce the culminating activity (see “Guided/Independent Practice”).

Modeling:

Using volunteers, demonstrate how a message would travel throughout the body. Show students how to fill out worksheets on the overhead.

Checking for Understanding:

Give examples and have students describe possible routes and possible body reactions.

Guided/Independent Practice:

The class will be split into three groups. Each group will form a body’s nervous system. Children acting as different body parts will get cards with messages telling what has happened to them. Messages will be passed to the brain, which will think of an appropriate response. The brain will then send this response to the appropriate body part (with the help of other neurons). Students will take turns being the brain. Students will keep track of where their messages travel. Students will be assessed on their participation and appropriate message sending.

Closure:

Appreciate your “telegraph lines” and study for your test!

Adaptations:

Extra assistance
There's a telegram for you ma'am,
And the message is clear.
It says there's something bugging you
And buzzing in your ear.
The results can be quite itchy
So what is your reply?
Tell your arm to swat that fly!

Hey, there's a telegraph line,
You got yours and I got mine.
It's called the nervous system,
And everybody understands
Those telegram commands
And you know that everybody better listen!

The central nervous system
Is the brain and the spine.
The brain controls the system
And the spine is the line.
Telegrams come in
To tell what's happening to you,
Then telegrams go out
To tell your body what to do.

There's a telegram for you sir,
Better read it on the spot.
It says your hand is near a stove
That's very, very hot.
The results can be quite painful,
And there's no time to think,
Quick! Pull that hand away, and get it to the sink!

There's a telegraph line,
You got yours and I got mine.
It's called the nervous system,
And everybody understands
Those telegram commands
And you know that everybody better listen!
Your peripheral nerves,
They go all out,
Delivering those messages
Your senses send out.
From your hearing and touch
To your sight and taste and smell,
They let your brain react
To all the messages they tell.

There's a telegram for you, kid,
And it's at an awful time.
It says you've gotta go on stage
And you forgot your lines
You're gonna be embarrassed,
'Cause this telegram's a rush.
Your heart starts beatin' faster and you blush!

Hey, there's a telegraph line,
You got yours and I got mine.
It's called the nervous system,
And everybody understands
Those telegram commands
And you know that everybody better listen!

The autonomic system
Has a hold of you,
Controlling automatically
Some things that you do.
Your breathing and your heartbeat
Just go on naturally
And when you're scared, your nerves
Rev up the speed!

Hey, there's a telegraph line,
You got yours and I got mine.
It's called the nervous system,
And everybody understands
Those telegram commands
And you know that everybody better listen!
Student Survey

The presented lessons were implemented in a fifth grade class as part of a science unit. Once the unit was complete, students were asked to fill out surveys, detailing their opinions about the use of literature for instruction. Below is the actual survey, and following it is a sample of student answers.

We used books (The Magic School Bus Explores the Senses and Oh, the Thinks you can Think!), songs (If I Only had a Brain and Telegraph Line), and a poem (My Universe) to help us learn about the nervous system.

Please tell me how you felt about this. Be as honest and as detailed as you can! Answer the following questions and add anything else you can think of:

1. How did you feel about using books, songs, and poems to learn science?
2. How was using books, songs, and poems different from how you usually learn science?
3. Did you feel that using books, songs, and poems made it easier, harder, or about the same for you to learn?
4. Did you feel that using books, songs, and poems made it more enjoyable to learn, less enjoyable to learn, or about the same?
5. Would you like to use books, songs, and poems to learn things in the future?
Literature and learning:

- “I think it helped, because it gave more information.”
- “I feel that books, songs, and poems made it easier because they made a lot of sense and had a lot of examples.”
- “They helped make studying easier.”
- “It was easier because the rhyme in the songs helped me memorize things.”
- “I liked singing the songs because then when you take the test, you can remember those songs and use them to help you.”
- “It was easier to learn, because I actually listened.”
- “Using books, songs, and poems was easier. We could use some challenge.”
- “The songs were hard to follow. You couldn’t tell what they were saying.”
- “I think it was harder. It was less enjoyable.”

Literature and enjoyment:

- “It made it more enjoyable for me because it’s learning and kind of having fun at the same time.”
- “I think using the books is good, but boring. I also think the poems and songs are a waste of time.”
- “It made it a lot more interesting.”
- “How I usually learn isn’t as fun and exciting.”
- “Using books, songs, and poems was regular. It wasn’t super fun, or extremely boring.”
- “It was more fun. I wish we could do it for different subjects.”
Differences from other instructional forms:

- “I usually don’t use these things, and it helped me a lot.”
- “I don’t think it’s really different than how we usually learn.”
- “They were different because books, songs, and poems are fun and funny.”
- “We usually just talk about the subject.”

Would like to have literature integrated into future lessons:

- 70% (14) Yes
- 15% (3) No
- 15% (3) Unsure
A Lesson Learned:
Integrating Literature into the Content Areas

Jennifer Harb

“Today’s young people, raised in a visually rich culture of television and video games, aren’t easily engaged by dry textbooks.”

~Cerullo, 1997, p. 2
“The knowledge that we store in the brain as part of our theory of the world is largely in the form of stories, which are far more easily remembered and recalled than sequences of unrelated facts.”

~Smith, 1988, as cited in Combs & Beach, 1994, p. 464

Learning from Literature

- Comprehending content
- Improving student literacy
- Exposing children to different cultures
Literature as a Bridge to Learning

• Enabling children to work at their ability levels
• Aiding students with different learning styles

Literature as a Bridge to Learning

• Encouraging extended study of specific interests
• Representing and considering different cultures and genders
Literature and Mathematics

- Solidifying abstract concepts
- Connecting mathematics to real life
- Improving attitudes towards math

Literature and Science

- Improving upon textbooks in date and depth
- Learning affectively
- Connecting science to real life
Literature and Social Studies

• Learning affectively
• Connecting social studies to real life
• Evaluating multiple perspectives

Choosing Quality Literature

• Choosing quality literature
  – Math: Schiro (1997)
  – Science: Science and Children
  – Social Studies: Social Education (April)
• Determining accuracy
• Avoiding misconceptions
Choosing Quality Literature

• Ensuring appropriateness
• Inspecting presentation
• Verifying story and information agreement
• Avoiding stereotypes

Lessons in Literature

• Nervous system unit
  – Trade books
  – Songs
  – Poetry
Student Praise

• “I feel that books, songs, and poems made it easier because they made a lot of sense and had a lot of examples.”

• “…the rhyme in the songs helped me memorize things.”

• “It gives you more information than just talking about the subject. It was more enjoyable because it was fun and educational at the same time.”

Student Praise

• “It was easier to learn, because I actually listened.”

• “How I usually learn isn’t as fun and exciting.”

• “…we were always learning with textbooks. That was boring.”

• “…it helped me a lot.”

• “I wish we could do it for different subjects.”
A Lesson Learned

• “It was harder. It was less enjoyable.”

• “I thought using the books was good, but boring. I also thought the poems and songs were a waste of time.”

• Literature, when utilized correctly, is a valuable tool for complementing learning.

“There have always been stories, even in the earliest of times…it is through stories that we make and share meaning; it is the way we come to know and understand our world. It was that way then, and it is that way now.”

~Whitin & Wilde, 1995, p. ix
References


**Symposium Presentation Speech**

Hi! My name is Jennifer Harb, and today I am going to share a portion of my senior thesis with you. It is called “A Lesson Learned: Integrating Literature into the Content Areas. Please consider the following:

“Today’s young people, raised in a visually rich culture of television and video games, aren’t easily engaged by dry textbooks” (Cerullo, 1997, p. 2).

“The knowledge that we store in the brain as part of our theory of the world is largely in the form of stories, which are far more easily remembered and recalled than sequences of unrelated facts” (Smith, 1988, as cited in Combs & Beach, 1994, p. 464).

The goal of most teachers is to make learning as accessible and enjoyable to students as possible. Literature is one medium that can help them achieve this. Literature helps to tie concepts to student’s lives, providing them with a base of background knowledge to build upon. Being able to relate to the information makes it more meaningful and memorable. Students can also, through literature, link key terms, ideas, and events, rather than just learning them as isolated facts.

When literature, such as trade books, is used to teach other subjects, the time students interact with both text and the content area itself increases. Students also gain familiarity with different types of literature (expository, included) that they will be expected to work with throughout life.

Children, through literature, can learn much about the distinctness of different peoples, as well as similarities among the human race. As Kincade and Pruitt state, “While the textbook provides the structure of a culture, it is the trade books which provide a glimpse into its heart and mind” (1996, p. 8).
Literature helps individuals, as well as the group, learn to their potential. Classrooms are said to have students that vary two to three grade levels above and below where they should be at in reading ability. There are countless trade books on almost any topic imaginable for varied skill levels. This enables students to work at an intensity with which they are comfortable and capable. Literature helps to hit many different learning styles and interests, as well.

Since trade books tend to discuss issues in depth, students are able to further explore specific topics of study. Also, literature represents students of all genders and races, empowering them and giving them footsteps to follow. Females and certain minority groups learn best affectively, and literature helps to make this sort of learning possible.

Integrating literature and mathematics enables students to grasp abstract concepts by relaying them through situations students face daily. Students are able to recognize and appreciate the math that they do each day, and its importance in our society’s existence. It may also reduce the anxiety that some students associate with math, allowing them to focus on the task at hand.

The ever-growing collection of science literature provides students with information that is up-to-date and relevant. Science is often seen as being solely objective, which stifles curiosity in students. If children are instructed to be indifferent, how are they to develop a love for the world around them? Graves affirms, “Without an emotional attachment to learning, lasting learning simply doesn’t happen” (1999, p. 116). Characters in stories can share their experiences with readers, allowing students to gain a
more well-rounded understanding of a certain time period. This lets students compare their lives with the lives of people from the past.

Using a number of sources also forces students to recognize that there are always two sides to a story. When making decisions, multiple perspectives must be considered, and done so in an unbiased fashion. Through the use of literature, students can gain critical thinking skills that are necessary in making life choices, whether it be which of their friends to believe in a disagreement or, later in life, who to vote for in a presidential election.

It is vital that literature utilized for instruction is of good quality. Teachers may use their content knowledge to ensure a source’s worth, or consult with a librarian or co-worker if they are uncertain of their ability to do so. The following sources provide standards to consider and/or recommendations of literature that may be used to teach.

When choosing literature, you must make sure that it is free of errors. If mistakes are present, encourage students to find and fix them, or avoid using those parts altogether. Having correct information does not guarantee that misconceptions will not occur. Students may receive incorrect notions from both text and pictures and, while teachers may assume this will be set right in later grades, this is not always the case. Potential misconceptions must be anticipated and teachers must be prepared to deal with them proactively.

Both the information and the way it is presented must be appropriate for students and learning objectives. It is important that subject matter fits with the literature naturally, and that the story flows in a way that is not condescending. Stereotypes should be avoided and, if come across, dealt with to promote empathy and respect.
I applied my research to the fifth-grade class I am currently student teaching in. We completed a science unit on the nervous system, and incorporated literature in almost all of the lessons. I read students Joanna Cole’s *The Magic School Bus Explores the Senses* (1999) to teach them about the five senses and their relation to the brain, and Dr. Seuss’ *Oh, the Thinks you can Think!* (1975) to introduce the right and left brain hemispheres.

Students listened to *The Wizard of Oz*’s “If I Only had a Brain” (1995) and, during the instrumental portion, sang lyrics they had previously helped fill in to reinforce the senses. “Telegraph Line,” by Schoolhouse Rock (1998) taught students about the sections of the nervous system and how they work. While students examined pictures of real nerve cells on a PowerPoint, I read them a poem I had written, providing them with insight into what nerve cells are like and admiration for all they do for us.

Students seemed to enjoy the integration of literature into this science unit. They showed much progress between their pre-and post-assessments, though many factors could have helped contribute to their success. Students were asked how they felt about integrating literature into this unit. Here is what some of them said:

“I feel that books, songs, and poems made it easier because they made a lot of sense and had a lot of examples.”

“…the rhyme in the songs helped me memorize things.”

“It gives you more information than just talking about the subject. It was more enjoyable because it was fun and educational at the same time.”

“It was easier to learn, because I actually listened.”

“How I usually learn isn’t as fun and exciting.”
“…we were always learning with textbooks. That was boring.”

“…it helped me a lot.”

“I wish we could do it for different subjects.”

We must remember, however, that no two people are alike, and no two students learn in the same way. While most students found the use of literature to be a positive experience, a few did not:

“It was harder. It was less enjoyable.”

“I thought using the books was good, but boring. I also through the poems and songs were a waste of time.”

So, what did I learn from all of this, that I am here to share with you? Everything in moderation. Literature, when utilized correctly, is a valuable tool for complementing learning. After all, as Whitin and Wilde maintain, “There have always been stories, even in the earliest of times…it is through stories that we make and share meaning; it is the way we come to know and understand our world. It was that way then, and it is that way now” (1995, p. ix).