METHODS OF CONNECTING MATHEMATICS TO COMMUNICATION IN THE PRIMARY CLASSROOM

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Children's literature, when used appropriately and creatively, serves as an impetus for exciting teaching and learning, rich instructional tasks, and valuable assessment opportunities. Fiction and non-fiction books, as well as poetry and other forms of literature, have long been respected in reading and language arts classrooms. However, today's teachers are encouraged to integrate literature throughout the content areas of the early childhood curriculum. Ideas for using children's literature in mathematics are limited only by teachers' imaginations and creativity.

RATIONALE

As with any other instructional tool, it is important that teachers understand the rationale for planning and implementing lessons that feature children's literature. Our rationale is rooted in the power of story, the richness of integrated studies, the value of shared experience, connections of the curriculum to life outside of school, vocabulary and language development, the wide range of learners' responses to literature, and the variety of types of literature available.

THE POWER OF STORY

We all find pleasure in an intriguing, enjoyable story. Because of the natural love of stories shared by most learners in early childhood classrooms, teachers are well served to integrate stories throughout the content areas, including mathematics. The enjoyment of story not only enhances instruction, but may also nurture positive dispositions toward mathematics and literacy.

THE RICHNESS OF INTEGRATED STUDIES

The early childhood curriculum is dense with standards and objectives to be taught. Integrating the content areas facilitates teachers' efforts to teach concepts and skills deeply and presents learners with opportunities to realize connections among the content areas. Through the ideas of a keen, devoted teacher, children's literature can serve as the "glue" that bonds mathematics and other content areas together.

THE VALUE OF SHARED EXPERIENCE

When we reflect on our own school days, we may not remember the exercises on page 36 of our second-grade mathematics textbook, but it is likely that we all remember the teachers who read to us. When a teacher is reading a piece of literature, and children are engaged and involved, there is a magical bond like no other. The wonder of such a shared experience benefits teachers, who can incorporate curricular content into the sharing of a piece of literature, thus enriching instruction and assessment.

CONNECTIONS OF THE CURRICULUM TO LIFE OUTSIDE OF SCHOOL

Teachers are often asked, "Why do we have to learn this?" The primary curriculum is designed to prepare young learners for later school years, for functioning in society, and for eventual success in life. One key aspect of effective teaching is letting students know the purpose for what they are being taught. Fiction and non-fiction books, poetry, newspapers, and other types of literature often reveal aspects of life that require specific knowledge, skills, and dispositions. Because curricular connections embedded in literature are often subtle, teachers are presented with natural, rather than contrived, avenues for reinforcing the early childhood curriculum.

VOCABULARY AND LANGUAGE DEVELOPMENT

In mathematics, science, social studies, and other content areas, vocabulary often becomes a stumbling block for some learners. As students and teachers, most of us have witnessed less than ideal methods of teaching vocabulary terms. ("Copy these ten definitions into your notebooks. We will have a quiz on Friday.") Many pieces of children's literature infuse authentic opportunities for developing background vocabulary, thus helping language to "come alive" to students. Furthermore, literature leads learners to appreciate and make use of the beauty and power of language.

WIDE RANGE OF LEARNERS' RESPONSES TO LITERATURE

Teachers may use literature in connection with numerous opportunities for writing, critical thinking, and problem-solving. When learning tasks involving literature feature open-ended questions or other opportunities for creative expression, young learners might represent their knowledge in verbal, written, pictorial, concrete, and abstract forms.

VARIETY OF TYPES OF LITERATURE AVAILABLE

Literature takes many forms, which include fiction and non-fiction books, poems, riddles, puzzles, nursery rhymes, comic strips, and newspapers. Teachers and parents have access to a mind-boggling collection of old and new picture books and novels. Varied forms of literature, when used appropriately and with regard for the maturity and cognitive development of the learners being taught, add vitality and meaning to lessons. In our technology-rich, communication-oriented society, it is likely that the types of available children's literature will continue to expand in ways we do not even yet imagine.

IDEAS FOR INTEGRATING LITERATURE AND MATHEMATICS

Through literature, teachers nurture communication, which should be valued greatly in the mathematics classroom. It is crucial that teachers understand how their young students are thinking, and tasks that incorporate reading, writing, speaking, and listening aid teachers in assessing thinking abilities. There are many types of literature that may be used to integrate communication and mathematics and to

nurture reasoning in learners; among these are riddles, nursery rhymes, poetry, newspapers, and books.

RIDDLES

Riddles encourage critical thinking and problem-solving abilities, and numerous books containing riddles are available. Teachers may select riddles that are appropriate for the age groups with whom they work.

NURSERY RHYMES

Nursery rhymes have certainly stood the test of time; children and adults alike enjoy them. Keen teachers use nursery rhymes to their advantage in the mathematics classroom.

POETRY

Young students might write poems to assist them in conceptualizing mathematics basic facts. For example, if students are studying the multiplication tables, they may select particular facts that they have difficulty remembering and write "memory aid" poems. Many years ago, a third-grade student, who had difficulty remembering

7 X 8=56, wrote,

Now don't go

Getting things in a fix

'Cause 7 X 8 = 56.

It is likely that the author still remembers this poem, and therefore, can recall the basic fact. This type of poetry writing facilitates differentiated instruction, as each student may focus only on the "memory aids" that he or she needs. Poetry could be displayed on a bulletin board or in a class book.

NEWSPAPERS

Newspapers are rich tools that may be used to stimulate mathematical understanding in children. Young learners may use newspapers to find patterns (in words, numbers, photos, or graphics). They may search the pages of newspapers for words of particular length (2 letters, 3 letters, 4 letters, etc.), thus nurturing quantitative reasoning. After cutting out words of varying length, students could work together to create graphs comparing the numbers of words of each length they found. Another idea would be for the teacher and students to compare forecasted high temperatures for several consecutive days, thus analyzing change.

CHILDREN'S BOOK: *Little House in the Big Woods*

By Laura Ingalls Wilder (HarperCollins Publishers, 1932)

Summary: This is the first book of the *Little House* series, which is based on the life of the writer. Ma and Pa and Laura, along with Laura's older sister Mary and her younger sister Carrie, live a life touched by struggles yet rooted in old-fashioned

values of caring, sharing, and doing one's part to help one's family. *Little House in the Big Woods*, set in the period before the Ingalls family moved to the prairie, contains vivid descriptions of first-time happenings for Laura.

Ideas for Mathematics Lessons that Stem from the Book:

- "Laura nibbled away exactly half of hers, and Mary nibbled exactly half of hers,

and the other halves they saved for Baby Carrie. Then when they got home, Carrie had two half-cookies, and that was a whole cookie. This wasn't right. All they wanted to do was to divide the cookies fairly with Carrie. Still, if Mary saved half her cookie, while Laura ate the whole of hers, or if Laura saved half, and Mary ate her whole cookie, that wouldn't be fair, either. They didn't know what to do. So each saved half, and gave it to Baby Carrie. But they always felt that somehow that wasn't quite fair."

--pages 178-179

The following problem might then be posed: *Assume that the two cookies were the same size. How might they have been divided so that each girl (Laura, Mary, and Carrie) received the same amount? What if one cookie were larger than the other? How could the cookies then have been divided so that each girl received the same amount?* The discussion might easily lead to practice with concepts and operations of fractions.

CONCLUSION

It is hoped that the aforementioned ideas will provide "food for thought" for primary teachers. Of course, these are only a few examples; creative teachers will think of many more. Endeavouring to integrate communication and mathematics in meaningful ways will certainly lead to beneficial learning opportunities.