

Why Literacy Should be Included in an Effective Elementary Math Curriculum

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ABSTRACT

This article provides a brief overview of the key benefits of interdisciplinary instruction combining literacy and math, in addition to sharing three integrated lessons used in support of a traditional elementary mathematics curriculum to effectively review number bonds through 10 and simple additional and subtraction.

Keywords: cross-curricular, elementary mathematics, interdisciplinary, literacy, number bonds, poetry, simple addition and subtraction

INTRODUCTION

In August, when the school year spreads before us in an endless flip of calendar days, it is easy to forget how we will soon be pressed for time, desperate for just a little bit more in order to successfully impart all that we must before May. This pressure can be alleviated through interdisciplinary instruction and the benefits of pairing math and literacy abound. When merged, lessons incorporating both subjects spark interest. They are memorable and serve as a refreshing change of pace that involve children in innovative ways, thereby potentially enhancing learning as a result of increased engagement (Hidi, 1990; Schiefele & Winteler, 1992). Using literacy to present and review mathematical terminology and concepts has the added bonus of increasing the accessibility for verbal students (and teachers) who don't consider themselves 'mathematically-minded'. In these instances, literature can provide alternative explanations for abstract concepts while simultaneously offering context beyond a compartmentalized math class. Suddenly math can—and does—exist within the world in which we live, bringing greater meaning and higher incentive to the pursuit of math. In addition to aiding instruction, literacy can also help teachers assess learning. Writing about math necessitates reflection, requiring students to organize and consolidate their understanding. As such, it can serve as a powerful assessment, capable of discerning between rote memorization and true comprehension.

In my experience teaching prekindergarten through grade one mathematics and language arts, poetry effectively highlights the complementary nature of literature and math and can be an efficient teaching aid capable of successfully maintaining the integrity of both subjects (Kane & Rule, 2004). Here are three examples of lessons combining math and poetry that I have used to supplement a traditional study of number bonds through 10 and simple addition and subtraction.

LESSON 1: USING SONG TO STRENGTHEN RECALL OF NUMBER BONDS FOR 10

This first lesson is a compilation of two others seen floating around the Internet. When merged, they provide engaging review, effectively helping children memorize 11 ways to make 10. The first, and more familiar, is often referred to as a 'Rainbow to 10'. It features a visual representation of a rainbow where the ends of each color are labeled with a number 0-10 and 5 is duplicated in the middle. Using the rainbow, children can physically follow each color to connect bonds for the number 10. A related, though less popular lesson, involves literacy. In this lesson, the lyrics to a Children's Song entitled 'I can sing a Rainbow' are altered to read:

*Red and yellow and pink and green,
Purple and orange and blue,
I can sing a rainbow,*

Contribution of this paper to the literature

- The benefits of using poetry in support of elementary mathematics instruction are presented.
- Two potentially familiar lessons are merged, creating a new lesson reviewing number bonds for 10.
- Two original lessons integrating math and literacy are provided. They review simple addition and subtraction and are easily adapted to further integrate an additional subject review of the teacher's choice.

*Sing a rainbow,
You one can sing one two.*

*10 and 0 or 9 and 1,
8 and 2 make 10,
7 and 3
6 and 4,
5 and 5 make 10.*

The first paragraph is taken verbatim from Arthur Hamilton's song, while the second paragraph, sung to the same tune, was created to emphasize number bonds through 10. It aligns with the previous lesson perfectly providing an opportunity for perpetual review. Arguably a form of poetry, these lyrics strengthen recall by linking the information learnt to an enjoyable activity and using rhythm, rhyme and repetition to spur memory (Wassink, 2011).

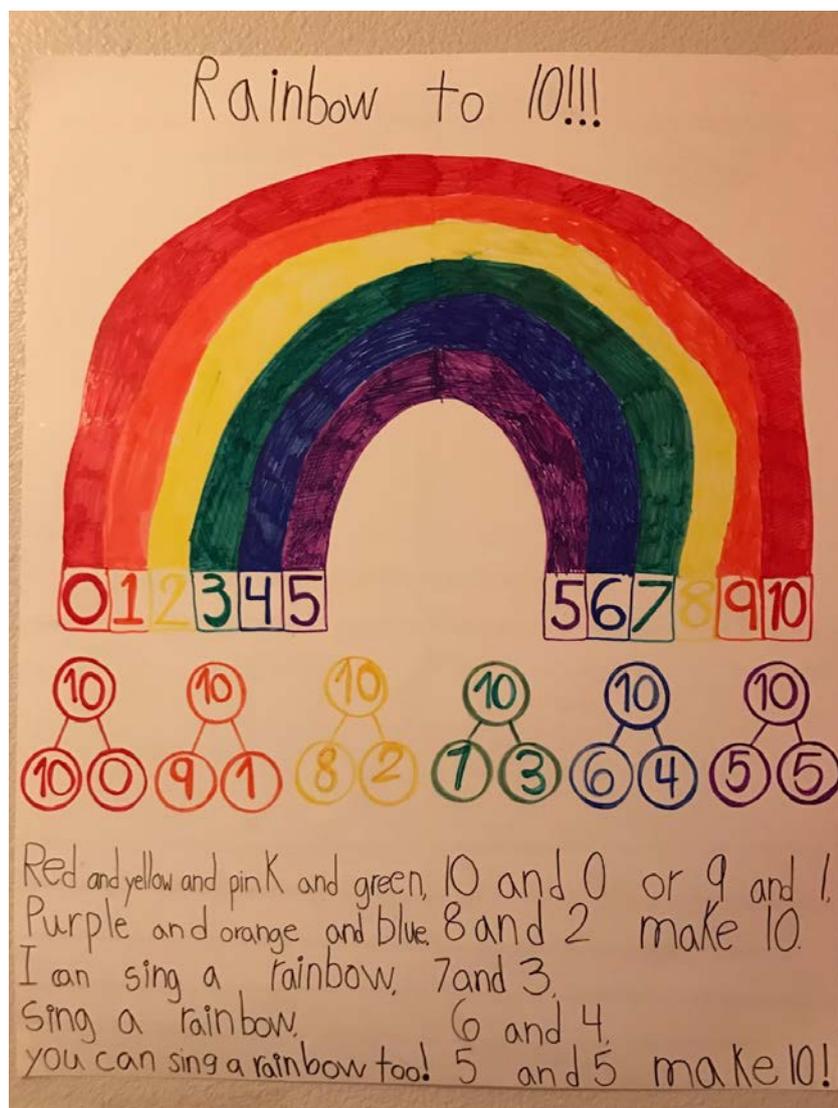


Figure 1. The poem "Rainbow to 10"

LESSON 2: USING POETRY TO REVIEW SIMPLE ADDITION THROUGH 10

While perusing math themed poetry to use in a shared reading lesson, I happened across a poem entitled 'Make it Count' by Eric L. Boddie. While the subject matter was inappropriate for elementary aged students, the mechanics were promising; line count and word count were identical in Boddie's poem. Following this pattern, I created a poem to use as the basis for an introductory lesson to a unit study on plants that would simultaneously provide a review of addition facts through 10. My poem read as follows:

A
*difficult thing
 to comprehend today,
 is what plants bring
 to each and every day.
 All the foods that we eat
 come from plants; without them we'd die!
 Our fruits and vegetables and even our meat,
 since the animals we love to eat can't deny
 that they too eat plants to grow. Isn't that neat?*

After discussing the meaning of the poem following the initial read, we focused on challenging vocabulary and a review of phonics patterns found within. The rhyme was immediately apparent and became the basis for a quick chart tracking different letter combinations capable of making the same sound, and letter combinations with two meanings (see [Table 1](#)).

Table 1. Catalog of Rimes related to the Rhyme Scheme

A / Today / Day	Thing / Bring	Eat / Meat / Neat	Die / Deny
A (the word)	Ing	_e (he)	_i (hi)
Ay (day)	Can be part of a word (thing, spring, etc.)	E_e (Pete)	l_e (five)
Ai (wait)	Can be added to the end of a verb to mean something is	Ea (eat)	le (die)
A_e (plate)	happening now (I am skipping.)	Ee (feet)	lgh (high)
Ey (they)		Y (silly)	Y (my)
Ei (eight)			

Our chart only covered letter combinations that were familiar at the time. In addition, we briefly reviewed syllables and suffixes while diagramming select words, ensuring that this lesson provided a broad review of multiple literacy skills.

After completing the word study portion of this lesson, we transitioned to math by more closely examining the rhyme and identifying the pattern using traditional letters (ababacdc) and nontraditional shapes. Next came the fundamental question: what do you notice about this poem that makes it special? The answer being, of course, that each line had one more word than the line before, beginning with 1 and ending with 10. Once this was determined, we marked each line 1-10 and proceeded to write the addition facts for each number beside each line: $1 = 1 + 0$ / $2 = 2 + 0$, $2 = 1 + 1$ / $3 = 3 + 0$, $3 = 2 + 1$ etc. When stumped, it was easy to show the whole/part concept by moving a finger to physically separate the words within a single line.

Not only was this a fun and effective review of number bonds through 10 and simple addition, it was also an engaging introduction to a unit study and an efficient review of multiple literacy skills. This lesson is easily adaptable by altering the poem's content to fit additional subjects and serves as a primer for the lesson 3.

LESSON 3: USING POETRY TO REVIEW SUBTRACTION THROUGH 10

As a homeschooling mother, I was able to adapt the previous lesson into a review of subtraction by working with my daughter to create a 10-line poem beginning with 10 words and ending with 1. This was challenging for her and did require more assistance than the previous lesson, not necessarily owing to challenging math, but because it is difficult to formulate thoughts that are progressively restricted! It would work well as a shared writing activity in a typical classroom setting and can be altered to effectively review any additional subject. Our topic was a recent family trip to Oregon and the completed poem read as follows:

*I went to Oregon to explore a brand new state.
I went to the sandy beach to find seashells.
In Portland, I went to the gardens where
I bought my pink, rose-shaped purse.
I went camping in a treehouse.
I rode a brown horse.
In one hotel was
a pool. I
swam a
lot.*

An extensive introduction to adjectives wound up being an unintended consequence of this lesson because writing involved consistently eliminating or adding them in order to maintain her desired subject while simultaneously achieving the correct number of words per line. In addition, she practiced handwriting, spelling, punctuation, editing and organizing, all while ensuring that she was consistently subtracting 1 word per line. The bulk of the time was spent writing, however when the writing was complete, we took turns testing each other by posing questions such as: What's line #9 take away line #4?

CONCLUSION

The possibilities of how to effectively incorporate literacy into a successful math curriculum are limited only by your imagination. Poetry proves an effective tool because it is short, easily set to song and can be readily altered to serve the dual purpose of highlighting another subject in need of review. With a little creativity, the lessons fashioned from the union of math and poetry can be designed to emphasize reading, writing or math without compromising the instructional value of the supporting subjects. Best of all, they are memorable and enjoyable – a perfect tribute to the way learning should be.

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