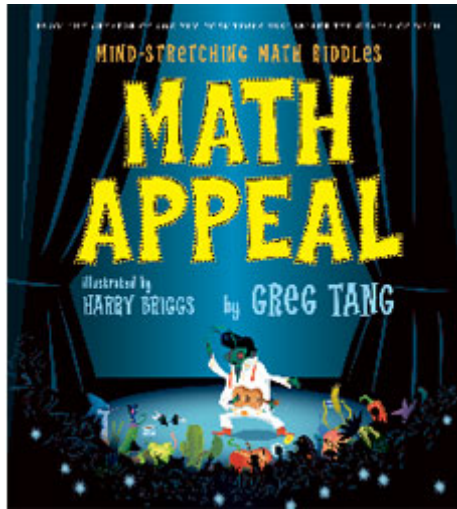


Children's Literature and Mathematics

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PJ4 Prof. Dan Jarvis

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Tang, Greg, Math Appeal New York: Scholastic Press, 2003.
ISBN 0-439-21046-1

Math Appeal is full of “mind-stretching math riddles”, instead of a specific storyline. Students are met with rhyming couplet poems and accompanying pictures that will help them solve the riddle lying in the poem. The vibrancy of the pictures and the complexity of the riddles, enable students to interact with the book on a variety of levels. From using grouping in rows and sub-groupings, to encountering patterns and shapes as tools to group with, strategies abound for students to learn from and utilize. Many of the riddles refer to objects, animals and plants that students are likely to have an understanding of, to help focus the attention on the riddle and not the curiosity of the pictures.

Critique of Book

Accuracy

The accuracy of a children’s book is very important when used to explore mathematical concepts. The terminology should be correct and the accompanying pictures depict what is happening in the text. More than being a number book that is straight counting, the category of accuracy presumes that there should be more than one way to solve the problem or several strategies applied. If there are any inaccuracies, the teacher must find them before using the text in class and introduce the inaccuracy to the students. This shared information can be used to develop better ways to tell the story through more accurate terms and concepts.

The mathematical concepts presented in the book use proper terminology where appropriate. Because it is written in rhyming couplets, there are times when mathematical terms are only alluded to briefly. For example, one of the pages includes the poem entitled “Ladies-in-Waiting”, that reads

“Bow to your partners one and all,
How many dots in the old dance hall?
Here’s a clue we’d like to share,
To count them fast just find a pair!”

The pictures used on every page visually show a strategy to get the answer for each riddle. Each riddle reinforces a different strategy that can be used to group objects that will help in the addition or subtraction of the total number of objects portrayed. Sometimes the poems are a little vague, so when you read them quickly they had to be reread to figure out the strategy they were looking for. The vagueness of the riddles is the only drawback for Math Appeal so we gave it a five out of six for accuracy.

Visual and Verbal Appeal

The visual and verbal appeal of a book often determines whether or not the book is ever picked up, let alone read. The illustrations should be bright, inviting and related in some way to the text to allow students to see the connections. If the pictures are exciting, but not related, they will detract from the story. If they are bland, they will not encourage engagement. Verbal appeal is just as important. If the book is too repetitive, the interest of the student will wane and there may be a lack in the number of approaches to a concept used.

Math Appeal scores high in this area. First, the title is an excellent example of word play on ‘mass appeal’. On the cover a bug, dressed like Elvis Presley is depicted, playing to a large and varied audience. The pictures are vibrant, but always related to the text. The poem riddles are brilliantly worded and encourage a new strategy for finding groups on nearly every page. Although the vagueness of some riddles detracted from accuracy, they help in the appeal to students to keep reading or to read it again. More than likely, this is due to the fact that it is a book that doesn’t talk down to students. The answer key in the back of the book is also nicely done, matching the pictures with the grouping lines shown and a number sentence to accompany them. It definitely deserves a six out of six for this showing.

Connections

It is vital that students see the importance of math in their everyday life. The earlier this connection is made, the better, because then mathematical concepts will be something they can ‘own’. If the connection is genuine, students will be able to see the relationship between things and not rely entirely on memorization of formulas.

The examples in Math Appeal, are ones that students can relate to. They introduce mathematical concepts in untraditional ways. The book gives most of its information in picture form, which is useful for students, when we consider just how much we rely on visual information to tell us things. The pictures use a wide variety of topics, such as food, animals and flowers which may help students of different interests connect with the book. We gave the book four and a half out of six because we are unsure if students would be able to recognize the relevance of the strategies in their own lives. In time, they would understand though that to be able to quickly figure out the amount of an object you have is very important, for example when paying for things with plenty of change or dividing several snacks among friends.

Audience

The better a book, is the wider an audience it should be directed towards. The trade book should be able to allow students who do not understand the full mathematical concept to enjoy the book on a surface level, while providing depth and layers to those who are ready for certain concepts and well into their understanding of those concepts. The author should take into account different cultures and genders that may be reading the book.

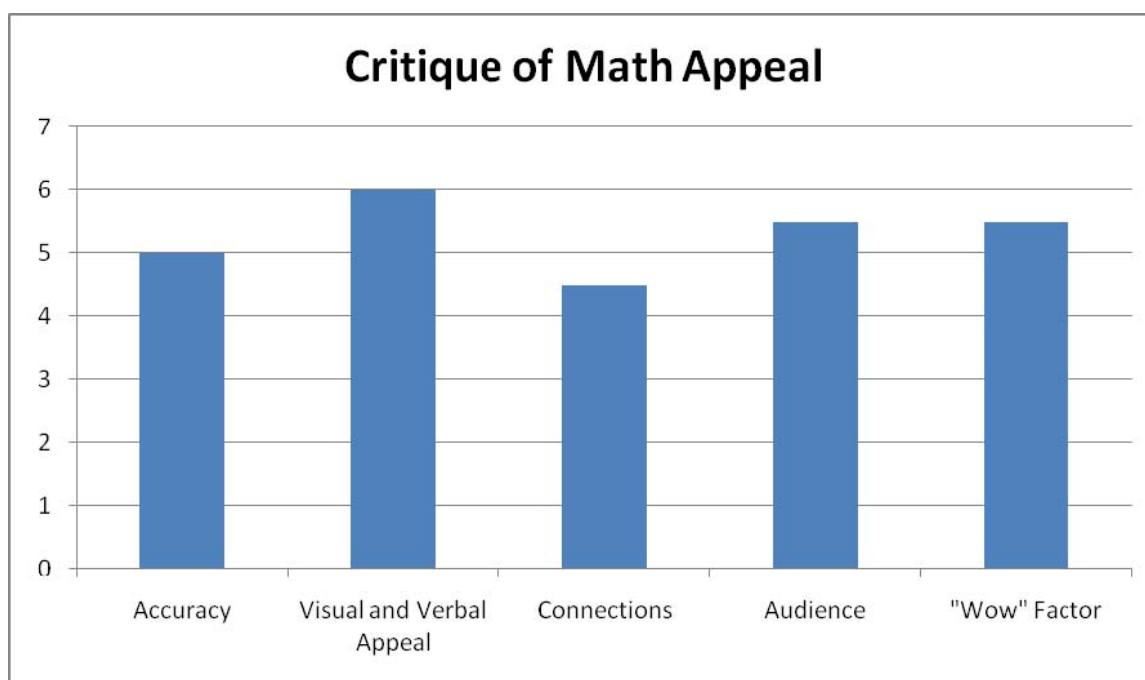
Math Appeal definitely has a large audience. Before students are ready for the concepts of grouping, the pictures entice them to count the objects depicted. The book encourages counting by certain numbers which can be more difficult depending on the amount being counted by. For example, the page where the reader is asked to count the peas by 11s, is a bit easier for some than being asked to count the sea animals by 6 and then subtracting the amount that are not sea horses. When they are first introduced to the concept of grouping, the answer key at the back, allows them a chance to self-evaluate and clarify where they may have gone wrong. Even at our age, we found it fun to try to figure out what each strategy the riddle was referring to and so we know that it would appeal to students of all mathematical abilities. Therefore, we gave it five and a half out of six.

“Wow” Factor

The “wow” factor refers to the fact that some books go above and beyond the obvious in introducing mathematical concepts. They show new and exciting ways of seeing problems developed and solved. The “wow” reminds us that not all mathematics can be tied down to simple formulas or concepts. The importance of the “wow” is to draw the reader towards a new understanding of ideas.

Math Appeal also scores highly on this criteria because for the age group that would read it, it shows just how visual patterning can be used in a variety of strategies to solve problems that they may never have thought of before. However, because these ideas are not entirely new, we deducted a half mark.

All in all we feel that Math Appeal is a highly entertaining and thought provoking book on transitioning students between simple addition and counting towards multiplication. It could help visually give concrete ideas behind division. The illustrations are excellently done and the riddles are fantastic. We would definitely use this book in a classroom setting to explore grouping strategies. And I think the task that we developed with it, is a fun and exploratory way to further the concepts introduced in the book.



Self Assessment:

All components of the assignment are complete	Yes	2 marks
Assignment is free from gross spelling and grammatical errors	Yes	2 marks
Ensured a wide variety of questions for before, during, and after to enable flexibility and maximize understanding in the lesson	Yes	2 marks
Critique defines criteria	Yes	2 marks
Critique is explained in reference to criteria	Yes	2 marks
Open ended and exploratory questions evident of knowledge of Bloom's taxonomy	Yes	2 marks
Application activity reflects concepts being studied	Yes	2 marks
Application is exploratory and not simply pen and paper memorization	Yes	2 marks
Cross-curricular strategies employed	Yes	2 marks
Total: 20 out of 20 Works well with partner	Yes	2 marks

By examining our project on the above criteria, we are confident that we did an outstanding job on working through the assignment and thinking about ways to incorporate the book into our classrooms in the future. Discussions with a school librarian in our previous practicum led us to Math Appeal, which we found to be a good source for several mathematical concepts. We worked as a team on a number of occasions to review the book and discuss the ways in which to present this assignment.

**Coffee Crisps, KitKats and AEROS too
They taste good but are not healthy for you
Chocolate on display is great to see
Especially if they are grouped in three
How many bars are for your delight?
Try to think of one of each per night.**



Answer key:

Count the number of one kind of chocolate bar and multiply by three.

1. Lesson Plan Information	
Subject/Course: Math	Name: Crystal Hoare and Melissa Launchbury
Grade Level: 3	Date: February 5 th , 2009
Topic: Grouping numbers: adding/subtracting/multiplication	Time and Length of Period: 2:00-3 P.M. 90 Minutes
2. Expectation(s) and Learning Skills	
The students will:	
<p>3M23: Solve problems involving the addition and subtraction of two-digit numbers, using a variety of mental strategies to add $37 + 26$, add the tens, add the ones, then combine the tens and ones, like this: $30 + 20 = 50$, $7 + 6 = 13$, $50 + 13 =$</p> <p>3M27: Relate multiplication of one-digit numbers and division by one-digit divisors to real-life situations, using a variety of tools and strategies (e.g., place objects in equal groups, use arrays, write repeated addition or subtraction sentences) problem: Give a real-life example of when you might need to know that 3 groups of 2 is 3×2.)</p> <p>Today, students will identify strategies used to solve addition and subtraction problems, which they will also relate to multiplication operations, through examples used in a read aloud book focusing on concepts of number grouping and patterning.</p>	

3. Pre-assessment

(i) Students

- Have used mental strategies to complete problems of addition and subtraction (eg. doubling numbers & adding on)
- Know how to count by fives and tens
- Have examined the relationship between addition and multiplication through the use of manipulatives

(ii) Differentiation of content, process, and/or product (may be accommodations and/or modifications)

There are a few students who have demonstrated some difficulty with the concepts covered in today's lesson (will need to focus particularly on BL and SD), and will benefit from the continued use of manipulatives & the assigned tasks. These manipulatives will be made available for any students who may require them.

B. Learning Environment Students will gather on the carpet to listen a mathematics story, and to answer questions before, during, and after the book is read. They will then return to their desks, which are organized in groups, to complete an assigned task.

**Direct Instruction Planning Format
2008-2009**

5. Application (Moving from guided, scaffolded practice to increasingly independent practice / understanding / gradual release of responsibility)

Students are given objects from around the classroom to arrange into groups using strategies outlined in the read. Each group of students have a different number of the same object (48 pencils; 24 erasers; 36 paper clips; 32 crayons). Students are responsible for determining how many equal numbered groups they can make using their objects, and explaining in mathematical terms how they accomplished this. They will then add to the book we read, creating a poem to explain the solution of their problem. The teacher will circulate around the room, taking photographs of the groups and of the poems the students create. The poems will be recorded on poster paper, which will then be placed on the wall in the classroom.

6. Lesson Conclusion

Students will present their poems to the class, outlining the strategies they employed to group and count their objects.

Recap the concepts and strategies outlined in the book, and explain that we can expand on them to include division.

7. Assessment (collection of data) / Evaluation (interpretation of data)

Anecdotal notes. Students will be observed to ensure they are making use of strategies discussed during the lesson. The grouping used in the application activity will serve as evidence of this, and to assess their understanding of the concepts.

Task Card: Grouping Numbers

Expectations

3M23: Solve problems involving the addition and subtraction of two-digit numbers, using a variety of mental strategies (e.g., to add $37 + 26$, add the tens, add the ones, then combine the tens and ones, like this: $30 + 20 = 50$, $7 + 6 = 13$, $50 + 13 = 63$)

3M27: Relate multiplication of one-digit numbers and division by one-digit divisors to real-life situations, using a variety of tools and strategies (e.g., place objects in equal groups, use arrays, write repeated addition or subtraction sentences) (Sample problem: Give a real-life example of when you might need to know that 3 groups of 2 is 3×2 .)

Materials Needed

- Class copy of "Math Appeal" by Greg Tang (for reference)
- Classroom manipulatives: pencils, paper clips, crayons, erasers
- Poster paper
- Markers

Your Task

In groups, you will create a poem similar to the ones in "Math Appeal", to explain strategies for grouping numbers and counting sums.

-Working with your deskmates, group together the manipulatives assigned to you, with equal numbers in each group.

-Create a poem to explain the strategies you used to group and count your manipulatives. Record this poem on the poster paper provided.

-Leave your groups of manipulatives on your desk, and present your poem to the rest of the class. Explain your solution, using your manipulatives to help you.

