

CI 176 – Planning and Assessment Portfolio
Documentation Sheet: **Journal Article**

NAME: SI

DATE: 2/6/12

NOTE: Remember to attach a copy of the article or the journal it was taken from.

Article reference, APA format: Barlow, A. and Drake, J. (February 2008). Assessing understanding through problem writing. *Mathematics: Teaching in the Middle School*, 13(6), 326-332.

Mathematics topic/process: Dividing by a Fraction

Grade level or range: 6th Grade

Mathematics Content and Process Standards:

California Mathematics Content Standards 6.NS.2.2 Explain the meaning of multiplication and division of positive fractions and perform the calculations (e.g., $5/8 \div 15/16 = 5/8 \times 16/15 = 2/3$).

California's Common Core Content Standards for Mathematics 6.NS.1 Interpret and compute quotients of fractions, and solve word problems involving division of fractions by fractions, e.g., by using visual fraction models and equations to represent the problem.

NCTM Principles and Standards for School Mathematics Grades 6-8 Number and Operations, work flexibly with fractions, decimals, and percents to solve problems.

Summary of article (narrative):

This article discussed the idea of assessing students through the use of problem writing (forming a word problem based on a given prompt). In regards to the topic of understanding and assessing comprehension, a study was done by giving forty-five sixth-grade students a prompt to respond to in the form of a word problem. The students were asked to respond to the following: Write a word problem that can be represented by $6 \div 1/2$. The authors of the article, Barlow and Drake, participated in this study and found shocking results after reviewing the students' responses. After scoring all forty-five students on a rubric including levels such as incorrect, minimal, partial, satisfactory, and extended, Barlow and Drake discovered that the majority of the students scored at the incorrect level. In fact, 13% of the students represented the problem as $6 \div 2$, 36% represented the problem as $6 \times 1/2$, and 18% represented the problem in another incorrect way. As a result of their findings, Barlow and Drake came to the conclusion that most of these students simply have a difficult time understanding how to represent division by a fraction. In addition, Barlow and Drake also discovered that by using an assessment tool such as problem writing, students' understanding can be shown on a variety of different levels (ranging from basic to advanced). In conclusion, the authors found that the

standards match the content
What about the process standards?
the article?



information teachers obtain from problem writing can better guide them in the right direction to build and support understanding among their students.

Clear &
interesting
summary.

Key content/process ideas from article (at least five, bulleted):

- Problem writing differs from many other assessments in that it is an open-ended assessment.
- Explaining the process of dividing a number by a fraction can be quite difficult.
- Many students struggle with representing division by a fraction!
- It is one thing to know how to get “the right answer,” but it is just as important to be able explain and understand why certain procedures are taken.
- It is a common mistake for students to represent dividing a number by a fraction as multiplying a number by a fraction.
- Assessing students in ways similar to problem writing can give a teacher a clearer idea on what specific areas his/her students need extra help with.

Excellent
points!

CI 176 – Planning and Assessment Portfolio
Documentation Sheet: **Children's Book**

NAME: 51 _____

DATE: 2/9/12

NOTE: Remember to attach a copy of the cover of the book.

Book reference, APA format: Cleary, B. (2006). *The Action of Subtraction*. Minneapolis: Millbrook Press.

Mathematics topic: Subtraction

Grade level or range: K-1

Mathematics Content Standards:

California Mathematics Content Standards 1.NS.2.5 Show the meaning of addition (putting together, increasing) and subtraction (taking away, comparing, finding the difference).

California's Common Core Content Standards for Mathematics 1.OA.1 Use addition and subtraction within 20 to solve word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions, e.g., by using objects, drawings, and equations with a symbol for the unknown number to represent the problem.

Summary of book (narrative): This is a fun, rhyming book about what it means to subtract and what results in doing so. The book even uses key vocabulary like "minus," "take away," and "equals" throughout its story. The story first starts off explaining what subtraction is ("an action that will make your total less") and continues to describe it as "taking away a part." It then continues to give numerous examples and situations that reflect subtraction (i.e. knocking down bowling pins). After these examples, the book touches on the subject of the equals sign. Finally, the story ends by giving a few more examples of subtraction and summing up the general idea. The book is obviously meant to be geared toward young students since it includes sing-song rhyming, funny comparisons, and kid-related topics.

Suggestion for using the book with students (at least five, bulleted):

- Reading this book to your students before introducing the topic of subtraction.
- Having students use this book as a guide if they ever get confused with subtraction.
- Reading this book to your students and then asking them to give their own examples of subtraction.

A focus on the meaning of subtraction - seems to match the book's intent.

I'm curious about how it portrays the equal sign

As a teacher you need to be cautious that it is not over simplified or too prescriptive

True with positive #'s, but not subtraction of negative numbers

This is one meaning. It could also be the difference between two sets.

sounds like a simplification of the meaning of subtraction for young children, which can be appropriate.

CI 176 – Planning and Assessment Portfolio
Documentation Sheet: **Mathematics Written Test**

NAME: St

DATE: 2/9/12

NOTE: Remember to attach a copy of the test.

Source, APA format: Hill, R. (2009). *California Math*. Boston, MA: Houghton Mifflin.

Mathematics topic: Place Value and Money

Grade level or range: 2nd Grade

California Mathematics Content Standards:
Page 107 "Spiral Review and Test Practice"

Problem #1: 2.NS.2.1

Problem #2: 2.NS.1.2

Problem #3: 2.NS.6.0

Problem #4: 2.NS.2.3

Problem #5: 2.NS.5.1

Page 110 "Concepts and Skills" & "Problem Solving"

Problem #1: 2.NS.5.2

Problem #2: 2.NS.5.1

Problem #3: 2.NS.5.1

Problem #4: 2.NS.5.1

Acceptable Responses

Page 107 "Spiral Review and Test Practice"

Problem #1: $5-3 = 2$

Problem #2: 70

Problem #3: 50

Problem #4: 70

Problem #5: 61¢

Page 110 "Concepts and Skills" & "Problem Solving"

Problem #1: 25¢, 1¢, 10¢, 50¢ (Coins drawn in the following order: Half dollar, quarter, dime, penny)

Problem #2: Possible coins to be drawn: 1 quarter & 1 dime, 1 quarter & 2 nickels, 1

maybe -
It seems to
fit better
with 1N5 2.3
and you recognized it
and not fit w/ 50¢

How does this show
the use of estimation
in computation &
problem solving?

How does this question assess
whether students can use the
inverse relationship between +/-
to solve problems and/or check
solutions? If they choose the
right number sentence does
it mean they understand
inverse operations?

quarter & 10 pennies, 3 dimes & 1 nickel, 3 dimes & 5 pennies, 2 dimes & 3 nickels,
2 dimes & 15 pennies, 1 dime & 25 pennies, 35 pennies

Problem #3: $32¢ < 35¢$

Problem #4: $13¢$ because $25¢+25¢ + 10¢+2¢=62¢$ and $75¢-62¢ = 13¢$ or $62¢ + \boxed{10¢+3¢} = 75¢$
 $10+3=13¢$

The degree to which the test items match the standards

I think the test does a fabulous job matching with the California Mathematics Content Standards (specifically Number Sense). In fact, each question on the test even labels which mathematics standard it matches up with. In my opinion, every question on the test is also both clear and concise. One example of how well the test is linked to the standards is problem #2 on page 107 (which addresses standard 2.NS.1.2). The problem, which asked to identify the number when given 7 tens and 0 ones, is a definite way to use expanded form to represent the number 70. In addition, problem #4 on page 110 works in complete accordance with standard 2.NS.5.1. After being told that Mara has specific amounts of different coins, the student solving the problem must use his/her knowledge of combining coins in order to determine how much more money Mara needs to buy a purse costing 75¢. This is clearly a perfect representation of combining coins to solve problems (like standard 2.NS.5.1 states). All in all, I believe this test was extremely successful in working hand-in-hand with the California Mathematics Content Standards.

Good
Example

Do you think it's possible a student could get it right even though s/he may not understand expanded forms or place value?
What other answer has both a 7 and a 0
Do you think students would still get it right if it was just: 7 tens
or 0 ones, 7 tens?

CI 176 – Planning and Assessment Portfolio
Documentation Sheet: **Mathematics & Social Sciences**

NAME: 51 _____

DATE: 2/19/12

California History Social Science Content Standard

K.4.3 Identify traffic symbols and map symbols (e.g., those for land, water, roads, cities).

California Mathematics Content Standards K.AF.1.1 Identify, sort, and classify objects by attribute and identify objects that do not belong to a particular group (e.g., all these balls are green, those are red).

What would you do to connect these standards in a lesson or unit?

First, I would bring in various pictures or cut-outs of different traffic symbols and map symbols (i.e. a cut-out of a stop sign, picture of a compass, etc.). I would then break my students up into a few separate groups (number depending on how many pictures/cut-outs I brought) and give each group a mixture of the various pictures/cut-outs of symbols. Then, I would ask each group to sort the pictures/cut-outs they were given into two different groups: those that represented traffic symbols and those that represented map symbols. In doing so, the students could work together and build on each others' identification and classifying skills. I would then ask the students to raise only the traffic symbols in the air. Next, I'd ask them to put those down and raise the symbols that don't belong with the traffic symbols (the map symbols). In doing so, the students would be able to recognize relationships among the symbols and distinguish which ones do not belong. Afterwards, I would have the students break up the pictures/cut-outs into four different groups of symbols: those for land, water, roads, and cities. I would have each corner of the room be one of the four groups and ask students to set their symbols down in the correct corners they belong in. Finally, I would check for understanding by going to each corner (land, water, roads, and cities) and reading off which symbols were placed where.

In general, how can integrating mathematics and social science make mathematics more meaningful?

Integrating mathematics and social science can make mathematics more meaningful by helping children make connections. For example, so many of the social science content standards appear in our day-to-day lives. As a result, most students can better relate to various subjects when they are tied to what the children experience everyday. One great reflection of this idea is the social science standard I previously used in this assignment (K. 4.3 Identify traffic symbols and map symbols...). Traffic and map symbols most children see without even really looking for them. In fact, these sorts of symbols show up just about everywhere. When a standard like this is linked to a mathematics standard, students are more likely to understand and appreciate the mathematics side of a lesson since they already have background knowledge to build on (their knowledge of symbols). As a result, the mathematics incorporated becomes much more meaningful for them.

An interesting way to connect these standards. You recognized how you can incorporate sorting & classifying throughout the curriculum.

True

CI 176 – Planning and Assessment Portfolio, Scoring Guide

PROFESSIONAL READING: Journal Article

	Possible Points	Your Score
Copy of the article & Reference	1	1
Mathematics topic/process & grade level	1	1
Mathematics Content Standards	3	3
Summary of article	2	2
Key content/process ideas	3	3
TOTAL	10	10

INSTRUCTION: Children's Book

	Possible Points	Your Score
Copy of the cover & reference	1	1
Mathematics topic & grade level	1	1
Mathematics Content Standards	3	3
Summary of book	2	2
Suggestions for use with students	3	2
TOTAL	10	9

ASSESSMENT: Mathematics Written Test

	Possible Points	Your Score
Copy of test & reference	1	1
Mathematics topic and grade level	1	1
Mathematics Content Standards (by item)	3	2.5
Acceptable responses (by item)	3	3
Opinion of match between item & standard	2	1.5
TOTAL	10	9

MATHEMATICS AND OTHER SUBJECTS: Mathematics and Social Sciences

	Possible Points	Your Score
CA History Social Science Standard	2	2
CA Mathematics Content Standard(s)	2	2
Connections in lesson or unit	3	3
Making mathematics meaningful	3	3
TOTAL	10	10

Grand Total: 38 /40