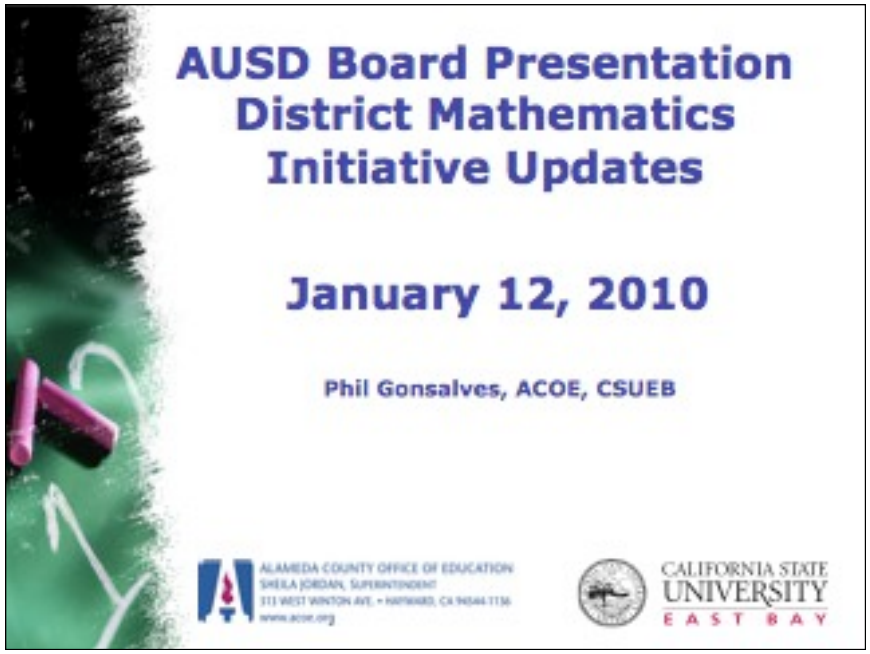


AUSD Board Presentation
District Mathematics Initiative Updates

January 12, 2010

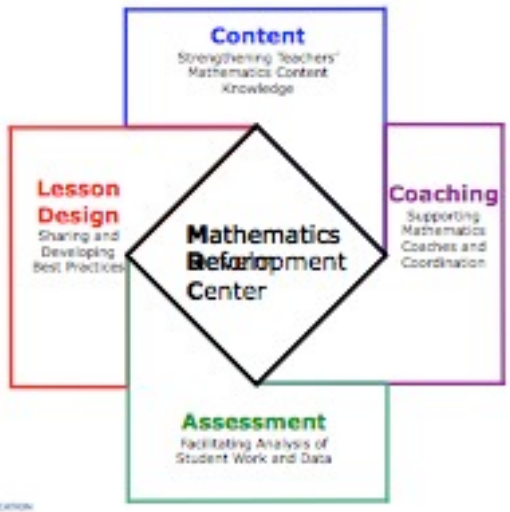
Phil Gonsalves, ACOE, CSUEB

ALAMEDA COUNTY OFFICE OF EDUCATION
SHEILA JORDAN, SUPERINTENDENT
313 WEST WINTON AVE. • HAYWARD, CA 94544-1136
www.acoe.org

CALIFORNIA STATE UNIVERSITY EAST BAY

1

Theory of Action



2

District-Wide Mathematics Professional Development Support

Including:

- Provided Grades K-12 mathematics PD on August 26, 2009
- Provided Grades 3-5 mathematics PD on Oct. 30, 2009 & had teachers integrate the best practices into their textbook series -- model used to bridge the gap between PD and daily practice
- Provide monthly after school mathematics PD for Grades K-12
- Provide monthly PD for site administrators

3

A few comments from AUSD Teachers ...

Hi Phil,

I just looked at your Sieve of Eras PP presentation – looks good - which I'll show tomorrow. Kelly Schroeder showed it today. We're planning together and are focusing on alternate ways of concept presentation, as well as using the bar model in problem solving. I was teaching a mini-lesson on % today and found the bar model to be effective. It's nice to have lots of tools and to see students "get it." Thanks!

Glenn Aitkens / Edison / AUSD

4

1,000 - 376 =

$$\begin{array}{r} {}^{9}\cancel{1}{}^{9}\cancel{0}{}^{1}\cancel{0}0 \\ -\ 376 \\ \hline 624 \end{array}$$

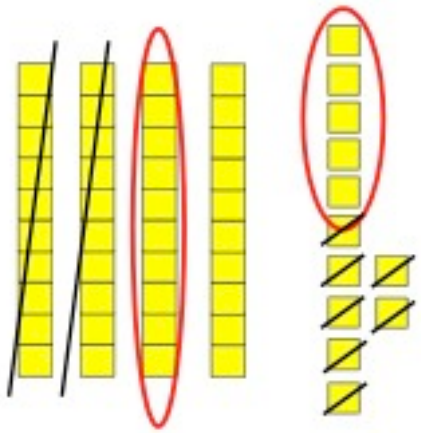
$$\begin{array}{rcl} 1{,}000 & = & 999+1 \\ -\ 376 & & -\ 376 \\ & & = 623+1 \\ & & = 624 \end{array}$$

$$1{,}000 - 376$$
$$= 1 + 999 - 376$$
$$= 1 + 623$$
$$= 624$$

5

42 - 27 = 15

$$\begin{array}{r} {}^{3}\cancel{4}{}^{1}2 \\ -\ 27 \\ \hline 15 \end{array}$$

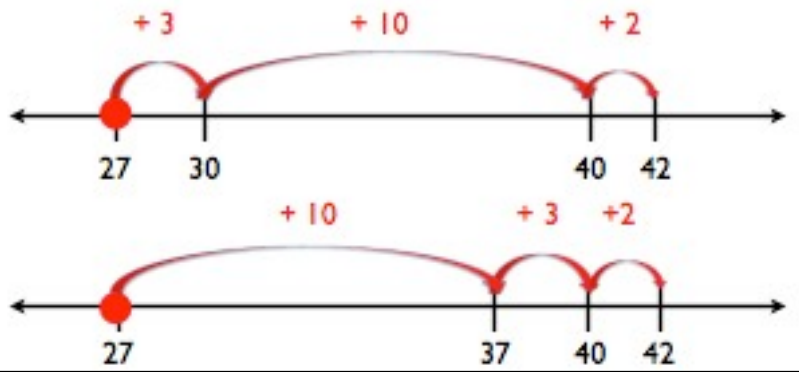


6

Subtraction on an open number line

42 - 27 = 15

Count Up (On)



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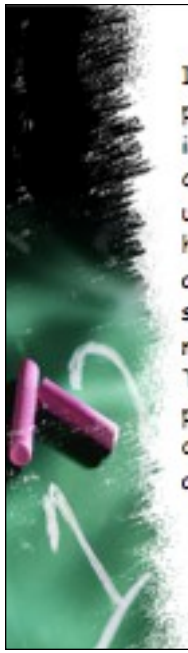
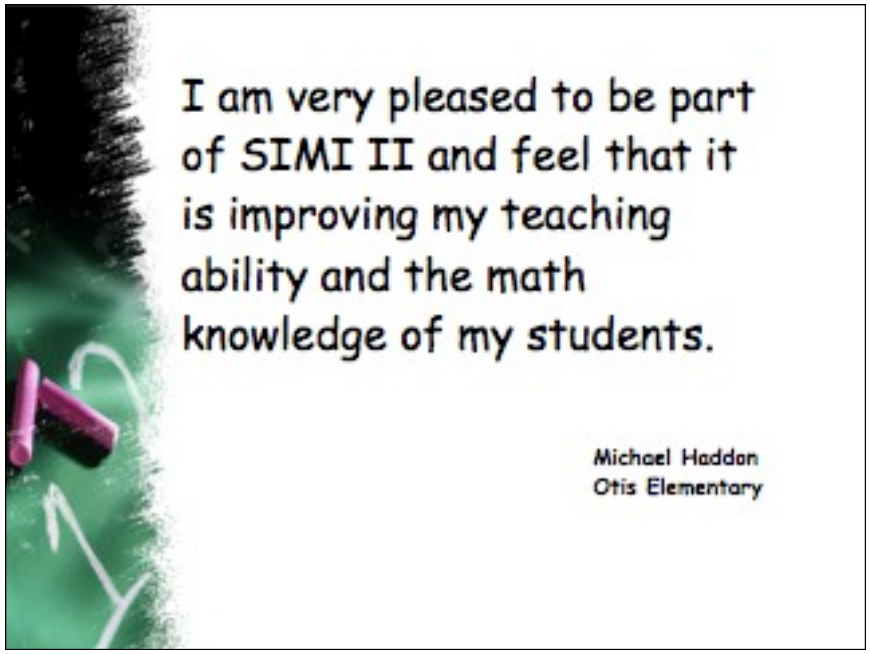


I just want to thank you for the wonderful math presentation. I was the resource teacher that walked in being a skeptic but walked out being a believer. I couldn't wait to really "teach" my students how to understand math and stop being intimidated by it. We have spent the last week using the bubble method to add unlike denominators and by golly, they get it. I see such a confidence and excitement with them that was missing when we were doing the same ol' boring stuff. This class is mixed with SDC and Resource - a lot of professionals told me these kids will never be capable of doing fractions, algebra, etc. Well, I say to them, "look at them now!!"

Anonymous

8


I am very pleased to be part of SIMI II and feel that it is improving my teaching ability and the math knowledge of my students.
Michael Haddon
Otis Elementary

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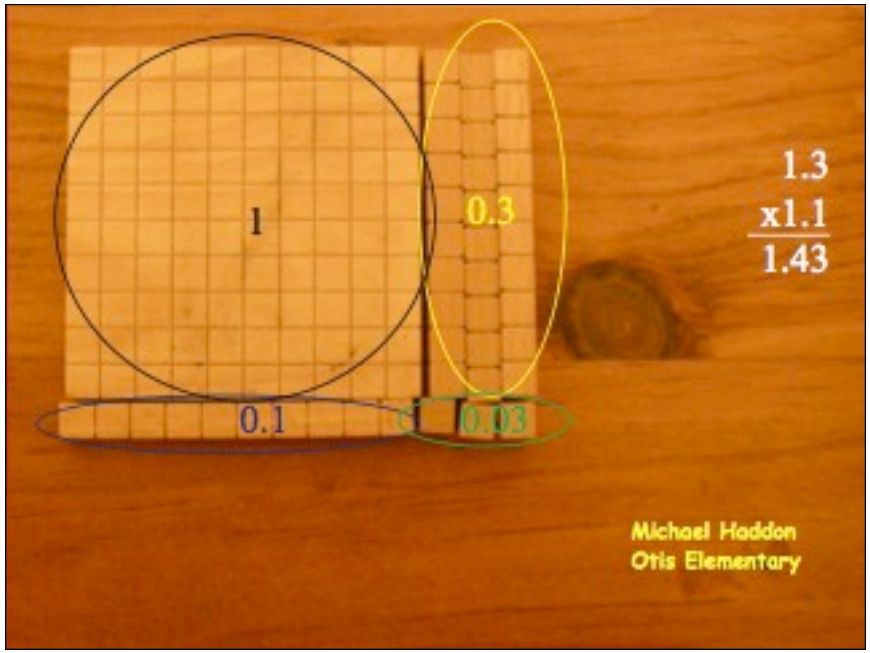
1
0.3
0.1
0.03
1.3
x1.1
1.43
Michael Haddon
Otis Elementary

10

After School Mathematics Professional Development:

Grade Levels:	Date:	Description:	Presenter:
K – 2	Oct. 29	Number Books, Ten Frames, Bar Models - for adding subtracting	Katherine Crawford
3 – 5	Oct. 27	Adding and Subtracting Fractions/ Mixed Numbers, LCM, Bubble Method	Aimée Penn
6 – 7	Nov. 5	Solving Equations - bar models, decomposition	Rick Doran
Algebra	Nov. 3	Graphing Linear and Quadratic Functions	Joy Sigmon

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After School Mathematics Professional Development:

Grade Levels:	Date:	Description:	Presenter:
2 – 3	Dec. 10	Instructional mitigations based on Trimester 1 data	Katherine Crawford
4 – 5	Dec. 8	Instructional mitigations based on Trimester 1 data	Aimée Penn
6 – 7	Dec. 9	Linear Functions	Rick Doran
Algebra	Dec. 1	Systems of Equations	Joy Sigmon
Special Ed Grades 6-12	Jan. 7	Relational Thinking	Phil Gonsalves

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Upcoming After School Mathematics Professional Development:

Grades 2-3	Grades 4-5	Grades 6-7	Algebra
January 28	January 19	January 20	January 6
February 25	February 16	February 17	February 3
March 25	March 16	March 17	March 3
April 29	April 20	April 21	April 21

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Working With Site Administrators

Provide monthly PD for site administrators:

- **August 18, 2009 AUSD Site Administrators Passport PD**
- **October 23 & 28 Elementary School Site Walk–Through**
- **November 24, 2009 Principal Mathematics PD (Focused on content and instructional practices)**
- **Upcoming Principal Mathematics PD**
  - **January 26, 2010 (Focused on Data)**
  - **February 23, 2010**
  - **March 23, 2010**
  - **April 27, 2010**
  - **May 11, 2010**

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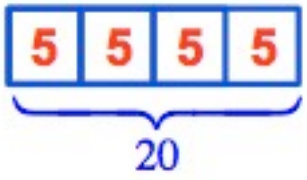
Relational Thinking

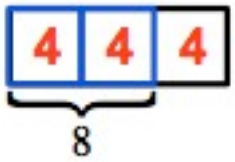


$$\frac{y}{4} = 5$$

$$4\left(\frac{y}{4}\right) = 4(5)$$

$$y = 20$$

15



$$\frac{2x}{3} = 8$$

$$\frac{3}{2}\left(\frac{2x}{3}\right) = \frac{3}{2}(8)$$

$$x = 12$$

16

Using Data to Develop Instructional Mitigations

- Developed Benchmark Assessments for Grades K-Algebra as per MOU
- Developed Benchmark Assessments for Geometry and Algebra II
- Provide Ongoing Professional Development on Using Data to Develop Instructional Mitigations

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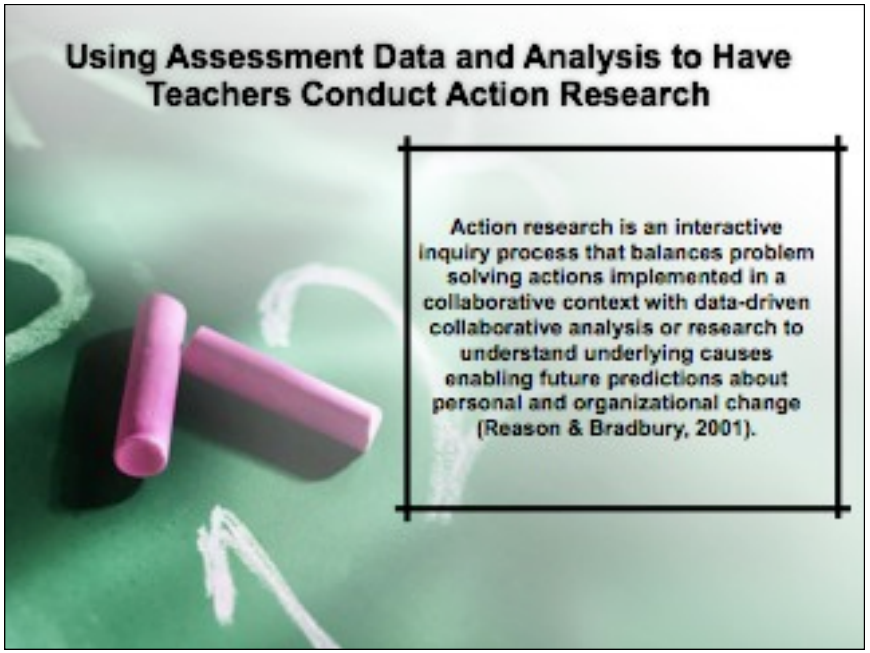
Using Assessment Data and Analysis to Have Teachers Conduct Action Research



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Example of Using Data to Inform Practice

Grade 3 Trimester 1 Assessment (n = 190)

12) Ashleigh had 15 barrettes. She got some more for her birthday. Now she has 32 barrettes. How many barrettes did she get for her birthday?

A	17	key	36%
B	23		12%
C	27		7%
D	47	→	45%

$$\begin{array}{r} 15 \\ +\ 32 \\ \hline 47 \end{array}$$

NS 2.1

Philip D. Gonsalves

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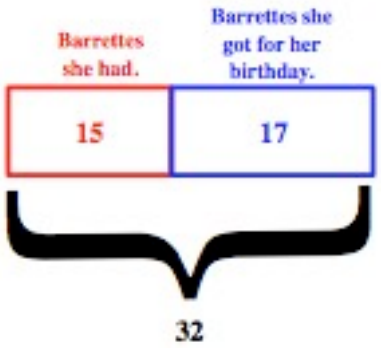
Grade 3 Trimester 1 Assessment (n = 190)

12) Ashleigh had 15 barrettes. She got some more for her birthday. Now she has 32 barrettes. How many barrettes did she get for her birthday?

A	17	key	36%
B	23		12%
C	27		7%
D	47		45%



$$\begin{array}{r} 32 \\ -\ 15 \\ \hline 17 \end{array}$$

NS 2.1

Answer: Ashleigh got 17 barrettes for her birthday.

Philip D. Gonsalves

20

Simplify: $\dfrac{22s^3t}{55s^3t^2}$

Sample of Professional Development – Developing Instructional Mitigations Based on Data

A) $\dfrac{2t}{11}$ 15%

B) $\dfrac{2}{5t}$ 40% Key

C) $\dfrac{2st}{5}$ 31%

D) $11s^3$ 13%

What percent of students chose each response?

1) What error might students have made to obtain each of the incorrect responses?
2) What specifically can teachers do to help each of the students who chose an incorrect response? Determine a specific mitigation for each of the incorrect responses.
3) How should this be taught?
4) What would you write?
5) What would you say?

21

Simplify: $\dfrac{22s^3t}{55s^3t^2}$

Error Analysis

A) $\dfrac{2t}{11}$ 15%

B) $\dfrac{2}{5t}$ 40% Key

C) $\dfrac{2st}{5}$ 31%

D) $11s^3$ 13%

$\dfrac{22s^3t}{55s^3t^2}$

$\neq \dfrac{22}{55}s^{3-3}t^{2-1}$

$= \dfrac{2}{11}s^0t^1$

$= \dfrac{2t}{11}$

$\dfrac{22s^3t}{55s^3t^2}$

$\neq \dfrac{2}{5}st^1$

$= \dfrac{2st}{5}$

$\dfrac{22s^3t}{55s^3t^2}$

$\neq 11s^3$

What they have in common.

22

Simplify: $\frac{22s^3t}{55s^3t^2}$

$= \frac{2 \bullet 11 \bullet s \bullet s \bullet s \bullet t}{5 \bullet 11 \bullet s \bullet s \bullet s \bullet t \bullet t}$ Decompose

$= \frac{2}{5t}$ Equivalent forms of 1

$= \frac{2 \bullet 11}{5 \bullet 11} s^{3-3} t^{1-2}$ Properties of Exponents

$= \frac{2}{5} s^0 t^{-1}$ Arithmetic

$= \frac{2}{5}(1)\frac{1}{t}$ Properties of Exponents

$= \frac{2}{5} \bullet \frac{1}{t}$

$= \frac{2}{5t}$

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Mitigation Model – Grade 7
Trimester 1 Final

Problem #10 was the third missed problem in the district.

Problem #10

10 Simplify: $\frac{22s^3t}{55s^3t^2}$

A) $\frac{2t}{11}$ B) $\frac{2}{5t}$

C) $\frac{2st}{5}$ D) $11s^3$

AF2.3

Statistics: (District / Your Students)

Label	Frequency	Percent	Redo
A	54	15%	
B*	142	40%	
C	107	31%	
D	46	13%	
NR	2	1%	
TOTAL	351	100%	

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Correct Solution Debriefed:

B)

$$\frac{22s^3t}{55s^3t^2}$$

$$= \frac{2 \bullet 11 \bullet s \bullet s \bullet s \bullet t}{5 \bullet 11 \bullet s \bullet s \bullet s \bullet t} \text{ decompose}$$

$$= \frac{2}{5t}$$

Most Common Mistake Debriefed:

C)

$$\frac{22s^3t}{55s^3t^2}$$

$$= \frac{2 \bullet \cancel{11}}{5 \bullet \cancel{11}} s^{3-3} t^{2-1} \text{ Error!}$$

$$= \frac{2st}{5}$$

Mitigation: *DECOMPOSTION*

1. Identify your students who chose the incorrect answers & what mistakes they made.
2. Call them up for small group work focusing on decomposition & proving their work.
3. During the week review 4-5 warm-ups focusing decomposing and finding equivalent forms of 1.
4. Work on test taking strategies, specifically elimination of 1-2 answers when possible.
5. After mitigation, students demonstrate their understanding by completing one similar problem as a ticket in/out. Immediately you'll be able to identify those students who got it and those who are still struggling.

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Name: _____ REDO #10

Simplify: $\frac{24x^3y}{36x^3y^2}$

A) $\frac{4y}{6}$ B) $\frac{2}{3y}$

C) $\frac{xy}{6}$ D) $6x^3y$

Prove it!

Name: KEY REDO #10

Simplify: $\frac{24x^3y}{36x^3y^2}$

A) $\frac{4y}{6}$ B) $\frac{2}{3y}$

C) $\frac{xy}{6}$ D) $6x^3y$

Prove it!

$$\frac{24x^3y}{36x^3y^2}$$

$$= \frac{2 \bullet 2 \bullet 2 \bullet 3 \bullet x \bullet x \bullet x \bullet y}{2 \bullet 2 \bullet 3 \bullet 3 \bullet x \bullet x \bullet x \bullet y \bullet y}$$

$$= \frac{1 \bullet 1 \bullet 2 \bullet 1 \bullet 1 \bullet 1 \bullet 1}{1 \bullet 1 \bullet 3 \bullet 1 \bullet 1 \bullet 1 \bullet 1 \bullet y} \text{ clean up step}$$

$$= \frac{2}{3y}$$

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Grade 7 Mitigation Warm-ups
Decomposition w/ clean-up step

Day 1	Day 2
Simplify. $\frac{10a^3b}{12a^4b^2}$ Solve the problem using decomposition. How many equivalent forms of 1 might you come up with?	Simplify the expression below using decomposition. Place the correct simplified solution in space C. Then come up with three incorrect answers using mistakes students might make. $\frac{105x^5y^2}{35xy}$ A. B. *C. D.
Day 3	**Day 4**
Simplify using decomposition. Show your "clean-up" step. $\frac{16s^3t^4w^2}{8s^3t^4w}$	Simplify the expression. Show your "clean-up" step. $\frac{15x^3y}{45x^3y^2}$
How many equivalent forms of 1 might there be in this problem? _____ What value remains in the denominator? _____	How many equivalent forms of 1 might there be in this problem? _____ What value remains in the numerator? _____