



Administrative Training

Components of an Effective Lesson

Teacher Expectancies


emphasizing

“5 + 1”



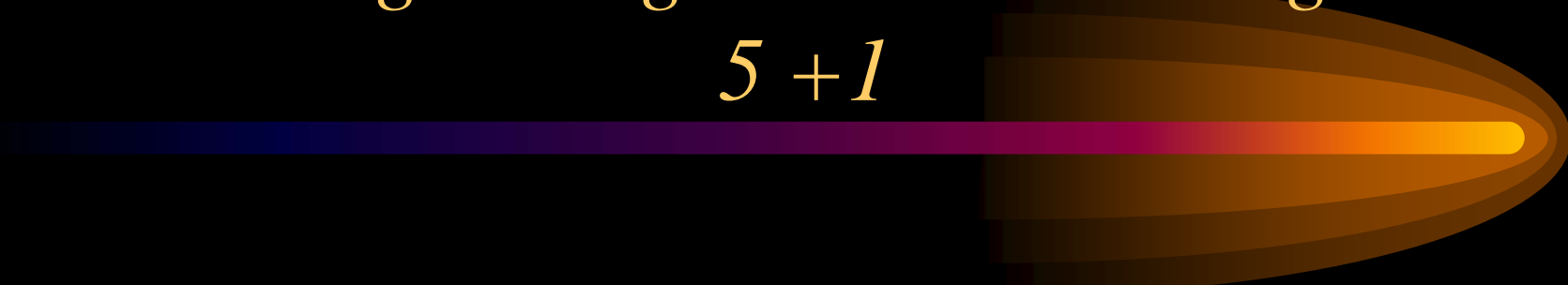
Superintendent's Goals

- Increase the graduation rate
 - Credits
 - HSPE
- Decrease the dropout rate
- Increase rigor of class work



Organizing Student Learning

5 + 1



- Instruction, Concept Development-Linkage
- Note Taking
- Homework
- Test Preparation
- Assessment

Student-Teacher Relationships

My Kid Standard



“5 + 1”

- Use the “5 + 1” to address student needs
 - Improve instruction
 - Increase student participation
 - Organize & focus student learning
 - Increase student achievement

Administrative Training

~ Effective Schools ~

Expectations make a difference!

“5 + 1”



Expectation - Goals

Being the best!

- What does it take to be the best?
- What are you willing to do?



*What are you doing
to improve instruction?*



*What are you doing
to help my child learn?*



Rules in Mathematics

Don't make sense!

Good News!



- Teachers are already employing many of the best practices needed to increase student achievement.



Best practices

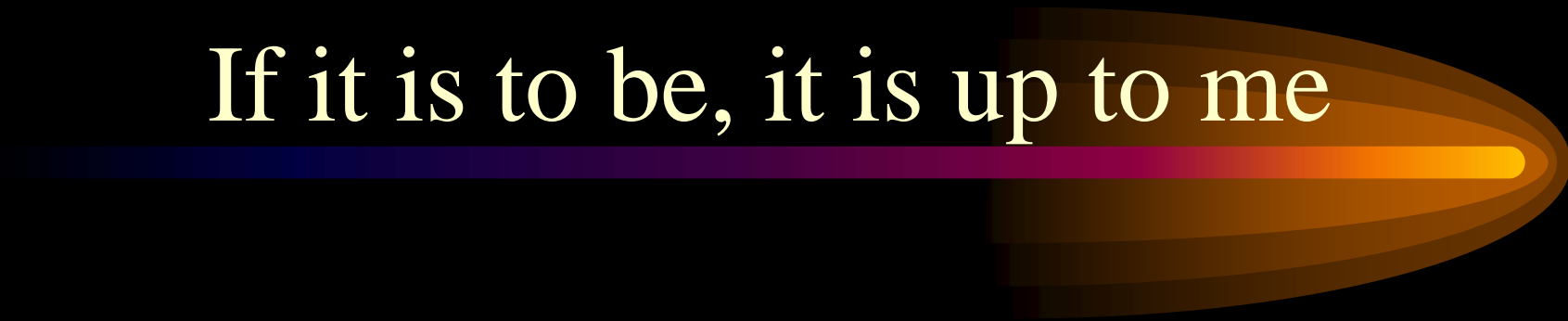
- Note taking
- Homework
- Tests

Actions follow beliefs



10 simple 2-letter words

If it is to be, it is up to me



Increasing Student Achievement



No simple answer-

what works is work



Success on Success

- First Test – Important for confidence!
 - Grade Distribution
- Success on Success
 - Teach students how to learn effectively and efficiently.
 - auditory
 - visual
 - kinesthetic
 - Concentration times

Studying



- Reading
- Thinking
- Reflecting
- Organizing
- Writing
- Analyzing
- Visualizing
- Reviewing
- Remembering
- Recalling



Student-Teacher Relationships

1. Treat your students the way you want your own children treated.
2. Build success on success.
3. Talk to your students. Be friendly.
4. Talk positively to your students about their opportunity to be successful.
5. Call home early with information and good news.
6. Make testing as much a reflection of your instruction as their studying.



Student-Teacher Relationships

6. Teach your students how to study effectively and efficiently (visual, audio, kinesthetic, concentration time).
7. Tell them you like them.
8. Go over expectations explicitly and give examples.
9. Build trust, make sure they know you are there for them by telling them you are.
10. Tell them you want them to succeed.
11. Continually answer the question; “What am I doing to help my students learn?”



Learning

Students learn best when they are given feedback on their performance and praised for doing things well



Unsuccessful Students





The Phone Conversation

- Introduction
- Pleasure teaching your son/daughter, nice young man/lady
- Explanation, how I intend to help your child succeed – Instruction
 - Clear instruction, linkage, memory aids
 - Notes, * system, very prescriptive
 - Homework, comes from notes & instruction
 - Oral recitation, procedures & formulas
 - Practice tests, * system
 - Study/flash cards
 - Reviews



The Phone Conversation

- Permission to use those strategies
- Parental help
 - Know when tests are scheduled
 - Examine student notebooks
 - Use flashcards to help study

Content & Pedagogy



1st Essential - Instruction





Instruction

- Teach for understanding
 - Its not a matter of *if* students will forget information, it's a matter of when they will forget
 - Students should be able to reconstruct knowledge over time



Instruction



Preparation

Creation of pre- or practice test before instruction begins suggests that teachers prepared for the unit; knowing where students traditionally experience difficulty and having resources and strategies ready to address those difficulties.



Preparation

- Practice test
 - Cover curriculum appropriately (rigor)
 - Grades - Fair & Portable
 - Benchmarked
 - Unit questions reflect questions on:
 - Curriculum
 - Unit
 - HSPE
 - Semester exams
 - College Entrance exams (ACT & SAT)

Balance

Balance in mathematics has been defined as:



- Vocabulary & Notation
- Concept Development & Linkage
- Memorization of Important Facts & Procedure
- Applications
- Appropriate Use of Technology

Balance should be reflected in assessments and in the delivery of instruction.

Vocabulary & Notation



There is no more single important factor that affects student achievement than vocabulary and notation



Vocabulary

- Find the degree of the monomial

$$4x^2y^3z^5$$

Best Bet?

– Bet A

- Probability of winning is $3/5$

– Bet B

- Odds of winning 3 to 5



Language Acquisition

- Double meanings

area

volume

operation

power

mean

feet

product

A decorative graphic consisting of a horizontal bar with a color gradient from dark blue on the left to bright yellow on the right. To the right of the bar is a teardrop-shaped graphic with a brown-to-gold gradient, pointing towards the right. The text 'MLL' is positioned at the top right of this teardrop shape.

MLL

Math Language Acquisition

Speaking



- Oral recitation
- Speaking
- Working in pairs (groups)

Oral Recitation



Language Acquisition

Teaches students how to learn

Embeds in short tem memory

Classroom Oral Recitation

- Procedure – Adding/Subtracting Fractions
 1. Find a common denominator
 2. Make equivalent fractions
 3. Add/Subtract numerators
 4. Bring down denominator
 5. Reduce

Classroom Oral Recitation

- Quadratic Formula

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$



Time on Task

Stake and local school districts usually determine the classroom time available to teachers and students. However, regardless of the quantity of time allocated to classroom instruction, it is the classroom teacher and school administrator who determine the effectiveness of the time allotted.

According to a survey conducted by the American Association of School Administrators, teachers identify student discipline as the single greatest factor that decreases time on task in the classroom. Generally, teachers with well-managed classrooms, have fewer disciplinary problems. These classrooms typically have teachers who have established rules and procedures in the classroom when the students arrive, and begin class promptly. They reduce the “wear and tear” on themselves and students by establishing procedures for make-up work, they arrange their room to accommodate their teaching philosophy and style, and they develop routines that increase overall efficiency. The benefits of establishing these classroom procedures and routines become apparent as the total time on task approaches the allocated time.



Time on Task

When teachers begin class immediately, students view them as better prepared, more organized and systematic in instruction, and better able to explain the material. Students also see these teachers as better classroom managers, friendlier, less punitive, more consistent and predictable, and as one who values student learning.

Routines like beginning class immediately, reviewing recently taught material, orally reciting new material, having students take notes, and ending the class by reviewing important definitions, formulas, algorithms, and the daily objective keep students engaged and on task. Quality time on task is not a “silver bullet” that can cure all the problems facing education. However, it can play an important role in increasing student achievement.

Content - Instruction



- What you teach affects student achievement
- How you teach it affects student achievement



Subtraction

$5 - 1$	$15 - 6$	$8 - 8$	$14 - 6$
$13 - 5$	$9 - 2$	$15 - 9$	$7 - 1$
$14 - 5$	$16 - 9$	$4 - 4$	$10 - 4$
$6 - 2$	$12 - 4$	$10 - 3$	$6 - 3$

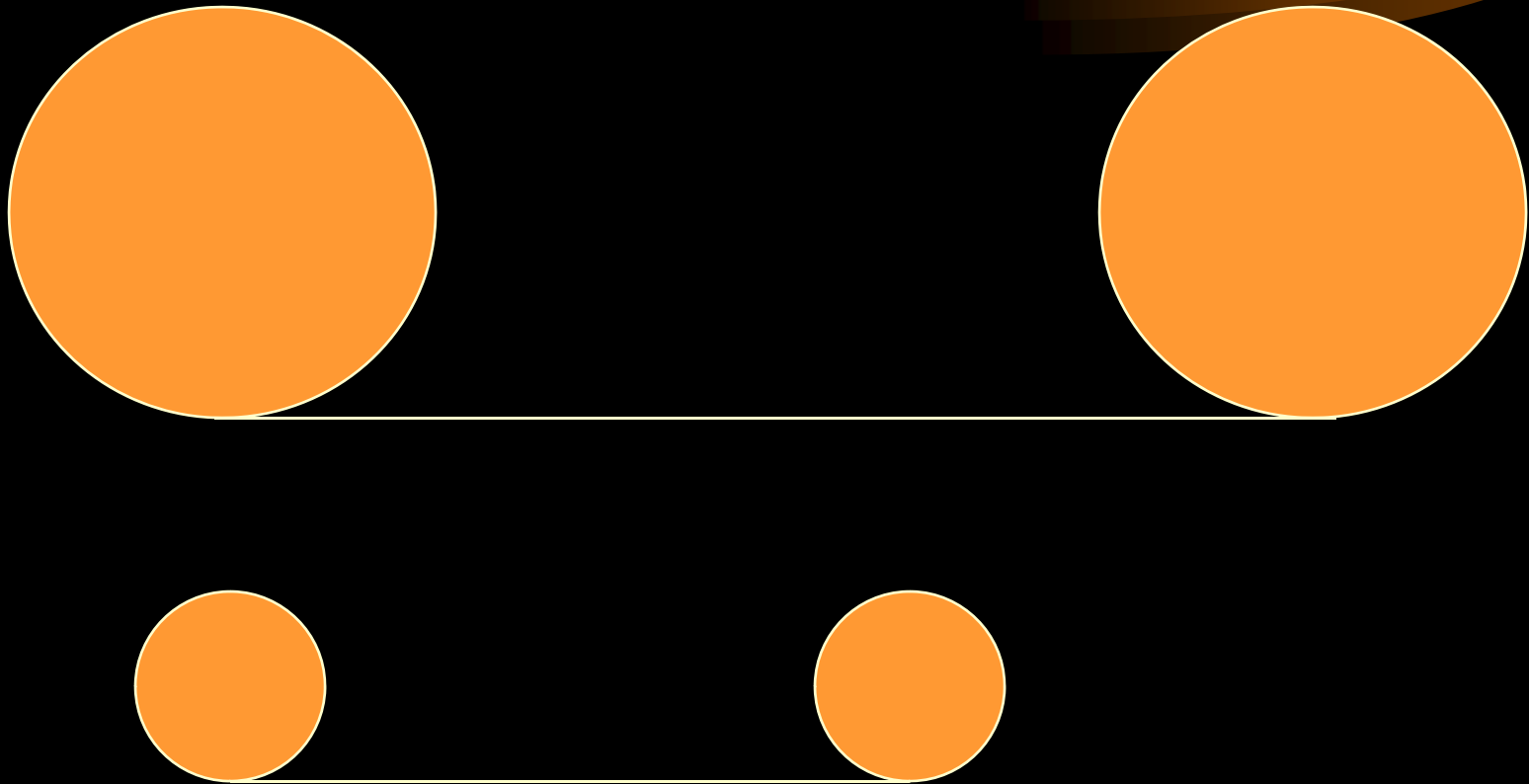


When will I ever use this?

- Pythagorean Theorem
- Parabola
- Circumference



Knowledge, Interest, & Enthusiasm



*Use simple straight forward
examples that clarify what you
are teaching.*

*Do not get bogged down in
arithmetic.*



Multiplication

- by 11
- by 25

Leading the department



- Leaders make sure all department members know what and how material is assessed and what a good answer looks like.
- Leaders make sure all members teach and assess the standards on high-stakes tests.

Different Ways to Measure the



Same Standard



Finding Measures of Central Tendency

1. Find the mean of the following data: 78, 74, 81, 83, and 82.
2. In Ted's class of thirty students, the average on the math exam was 80. Andrew's class of twenty students had an average 90. What was the mean of the two classes combined?
3. Ted's bowling scores last week were 85, 89, and 101. What score would he have to make on his next game to have a mean of 105?



I can't teach _____ because

my kids don't know _____

Show them how - Linkage



- Introduce new concepts using familiar language
- Review and reinforce
- Compare and contrast
- Teach in a different context



+ - Polynomials

$$672 = 6(100) + 7(10) + 2(1)$$

$$6 \cdot 10^2 + 7 \cdot 10 + 2$$

$$6 \cdot n^2 + 7 \cdot n + 2$$

$$6x^2 + 7x + 2$$

$$532 + 341 =$$

$$(5 + 3)(100) + (3 + 4)(10) + (2 + 1)(1) =$$

$$(8)(100) + (7)(10) + (3)(1) =$$

$$(800) + (70) + (3) =$$

$$873$$

Addition - Left to Right

$$\begin{array}{r} 412 \quad + \quad 362 \quad + \quad 213 = \\ (4+3+2)(100) + (1+6+1)(10) + (2+2+3)(1) = \\ (9)(100) \quad + \quad (8)(10) \quad + \quad (7)(1) = \\ (900) \quad + \quad (80) \quad + \quad (7) = \\ \quad \quad \quad 9 \ 8 \ 7 \end{array}$$

$$\begin{array}{r} 123 \quad + \quad 502 \quad + \quad 271 = \\ (1+5+2)(100) + (2+0+7)(10) + (3+2+1)(1) = \\ (8)(100) \quad + \quad (9)(10) \quad + \quad (6)(1) = \\ (800) \quad + \quad (90) \quad + \quad (6) = \\ \quad \quad \quad 8 \ 9 \ 6 \end{array}$$

$$5 \ 3 \ 2 \ + \ 3 \ 4 \ 1 = \ 8 \ 7 \ 3$$

$$(5x^2 + 3x + 2) + (3x^2 + 4x + 1)$$

$$(5x^2 + 3x^2) + (3x + 4x) + (2 + 1)$$

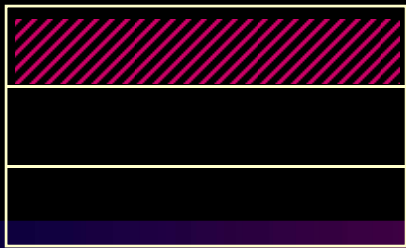
$$= 8x^2 + 7x + 3$$



Add / Subtract

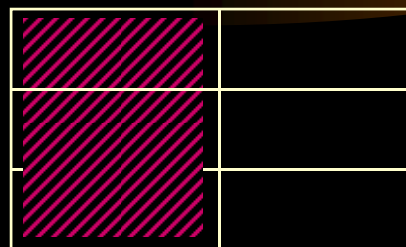
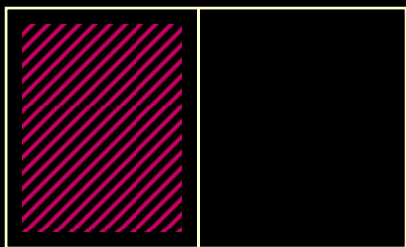
Rational Expressions

$$\frac{1}{3}$$



$$\frac{2}{6}$$

$$+ \frac{1}{2}$$



$$+ \frac{3}{6}$$

$$\frac{5}{6}$$

$$\frac{1}{3} + \frac{1}{2} = \frac{5}{6}$$

$$\frac{1}{4} + \frac{1}{5} = \frac{9}{20}$$

$$\frac{1}{3} + \frac{1}{4} = \frac{7}{12}$$

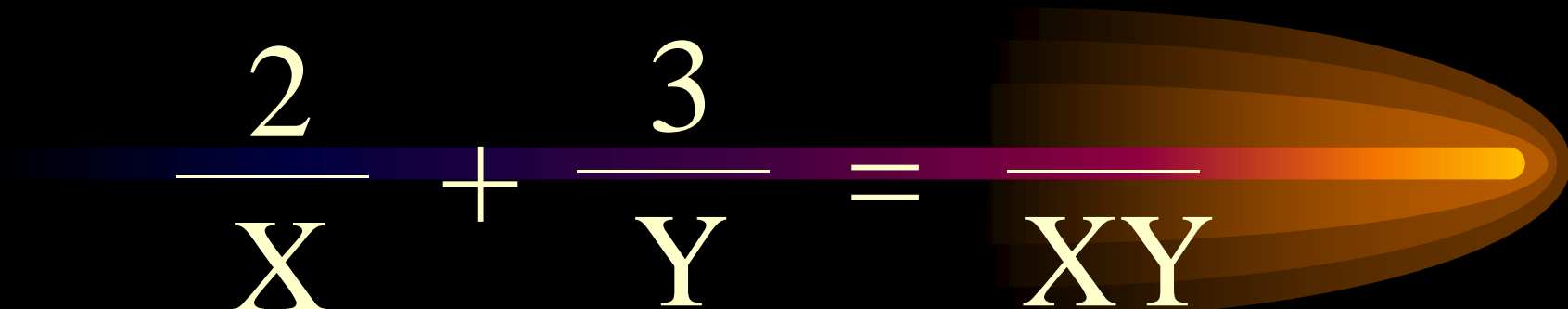

$$\frac{1}{3} + \frac{1}{5} = \frac{8}{15}$$

$$\frac{2}{3} + \frac{1}{5} = \frac{13}{15}$$

$$\frac{3}{10} + \frac{2}{3} = \frac{29}{30}$$

$$\frac{3}{4} + \frac{1}{5} =$$


$$\frac{3}{4} + \frac{1}{5} = \frac{19}{20}$$

$$\frac{2}{X} + \frac{3}{Y} = \frac{\quad}{XY}$$


$$\frac{2}{X} + \frac{3}{Y} = \frac{2Y + 3X}{XY}$$



$$\frac{A}{B} + \frac{C}{D} = \frac{\quad}{BD}$$

$$\frac{A}{B} + \frac{C}{D} = \frac{AD + BC}{BD}$$



$$\frac{3}{x-1} + \frac{2}{x+3} = \frac{\quad}{(x-1)(x+3)}$$

$$\frac{3}{x-1} + \frac{2}{x+3} = \frac{3(x+3) + 2(x-1)}{(x-1)(x+3)}$$



Relations & Functions



Functions

Special relation in which no 2
ordered pairs have the same 1st
element.

Menu



Hamburger4⁰⁰

Hotdog3⁰⁰

Sandwich5⁰⁰

H, 4⁰⁰

Hd, 3⁰⁰

S, 5⁰⁰

H, 4⁰⁰

Hd, (3⁰⁰

S), 5⁰⁰

(H, 4⁰⁰)

(Hd, 3⁰⁰)

(S, 5⁰⁰)

Cold Drinks

1, .50

(1, .50)

2, 1⁰⁰

(2, 1⁰⁰)

3, 1⁵⁰

(3, 1⁵⁰)

⋮

(10, ?)

1, .50

(1, .50)

2, 1⁰⁰

(2, 1⁰⁰)

3, 1⁵⁰

(3, 1⁵⁰)

$$C = n \times .50$$

$$= .50n$$

or

$$y = \frac{1}{2} X$$

⋮

(10, ?)



$(1, \underline{50})$ $(2, 1^{\underline{00}})$ $(3, 1^{\underline{50}})$

$(4, 2^{\underline{00}})$

$(4, 1^{\underline{75}})$



Functions

Special relation in which no 2 different ordered pairs have the same 1st element.

LINKING

- Introduce using familiar language

- Review & Reinforce

- Compare & Contrast

- Teach in different context

—————→ Increased Student Achievement

Linking



- Fractions
- Decimals
- Percents

Linking



- Pythagorean Theorem
- Distance Formula
- Equation of a Circle
- Trig Identity

Linking



- Special products in algebra
- Special products in arithmetic

Linking



- Quadratic Formula
- Completing the Square

Linking



- Solving Linear Equations
- Order of Operations



$$ax + b = c$$

- Linear equations
- Equations containing absolute value
- Radical equations
- Systems of equations
- Quadratic equations

Why Linking?

- It's not a matter of if students are going to forget information, it's a matter of when.
- Linking concepts will allow students to reconstruct concepts and skills

Basic Facts & Procedures



- Stopping to remember basic facts interrupts the flow of thought, which negatively impacts learning.



Memorization

- Memorizing can help students absorb and retain information on which understanding and critical thought are based.
- The more sophisticated mental operations of analysis, synthesis, and evaluation are impossible without rapid and accurate recall of bodies of specific knowledge.

It is my job to teach:



- Reading
- Writing



Reading

- Assign reading
- Explicitly introduce vocabulary & notation
- Preview reading
- Connect reading
- Check understanding of reading
- Correct their understanding
- Use paper & pencil



Organizing Student Thinking

- What's the easiest way to help students to organize their thinking?

Writing

Writing



- Definitions
- Procedures
- Linkages
- Applications
- Compare & contrast
- Describe what they understand
- Describe difficulty experienced
- Summarize
- Explain



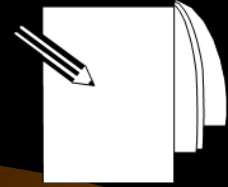
Instruction

- Instruction check
 - Pre test demonstrating pre-planning
 - Your own understanding of instruction
 - Unit test reflects other high stakes tests

2nd Essential - Note taking



Note Taking



Researchers - #1 Memory Aid - Writing it Down

Complete homework assignment

Prepare for unit test

Prepare for high-stakes tests

WHEN YOU MULTIPLY EXPONENTIALS WITH THE SAME BASE, YOU ADD THE EXPONENTS.

$$\text{Ex } 3^2 \cdot 3^5 = 3^7$$

$$\text{Ex } 5^2 \cdot 5^8 = 5^{10}$$

$$\text{Ex } 7 \cdot 7^4 = 7^5$$

$$\text{Ex } 2^3 \cdot 5^2, 2^4 \cdot 5^6 = 2^7 \cdot 5^8$$

Rules and examples

EXPONENTIALS

1/2

OBJ. TO SIMPLIFY EXPONENTIALS BEING MULTIPLIED WITH THE SAME BASE.

EXPONENT - TELLS YOU HOW MANY TIMES TO USE THE BASE AS A FACTOR

$$\begin{array}{c} 3 - \text{EXPONENT} \\ 2 \\ \cdot \\ \text{BASE} \end{array}$$

2^3 , read 2 to the 3rd power OR 2 cubed.

$$\begin{aligned} \text{By definition, } 2^3 &= 2 \cdot 2 \cdot 2 \\ &= 8 \end{aligned}$$

$$\begin{aligned} \text{Ex } 3^4 &= 3 \cdot 3 \cdot 3 \cdot 3 \\ &= 81 \end{aligned}$$

How could we simplify $2^3 \cdot 2^4$ in exponentiated form.

$$\begin{aligned} 2^3 \cdot 2^4 &= \\ (2 \cdot 2 \cdot 2) \cdot (2 \cdot 2 \cdot 2 \cdot 2) &= \text{How many times is} \\ &= 2^7 \quad \text{2 being used as} \\ &\quad \text{a factor?} \end{aligned}$$

$$\begin{aligned} \text{Ex } 3^2 \times 3^5 &= \\ (3 \cdot 3) \times (3 \cdot 3 \cdot 3 \cdot 3 \cdot 3) &= \text{By def} \\ &= 3^7 \end{aligned}$$

- Title
- Date
- Objective
- Vocabulary & Notation
- Pattern Development
- Rule
- Examples
- Variation

1/2

$$5^2 \cdot 5^8 =$$

$$(5 \cdot 5) \cdot (5 \cdot 5 \cdot 5 \cdot 5 \cdot 5 \cdot 5 \cdot 5 \cdot 5) = 5^{10}$$

Is there a pattern?

Rule 1. When you multiply exponentials with the SAME base, you add the exponents.

$$\text{Ex } 3^4 \cdot 3^5 = 3^{4+5}$$

$$= 3^9$$

$$\text{Ex } x^4 \cdot x^2 = x^{4+2}$$

$$= x^6$$

Generalizing: $A^x \cdot A^y = A^{x+y}$

$$\text{Ex } 7 \cdot 7^4 = ?$$

$$= 7^5$$



* If a # does NOT have an exponent, it is understood to be 1; $7 = 7^1$



Use simple straight forward
examples to clarify initial teaching!



Increase difficulty later.

Note check

- Student notes reflect instruction
- Contain title, date, objective, definitions, how to say it, pattern development, linkage, rules and exercises with developed rules
- White space
- Star * System
- Explanations ~ Cautions

3rd Essential - Homework

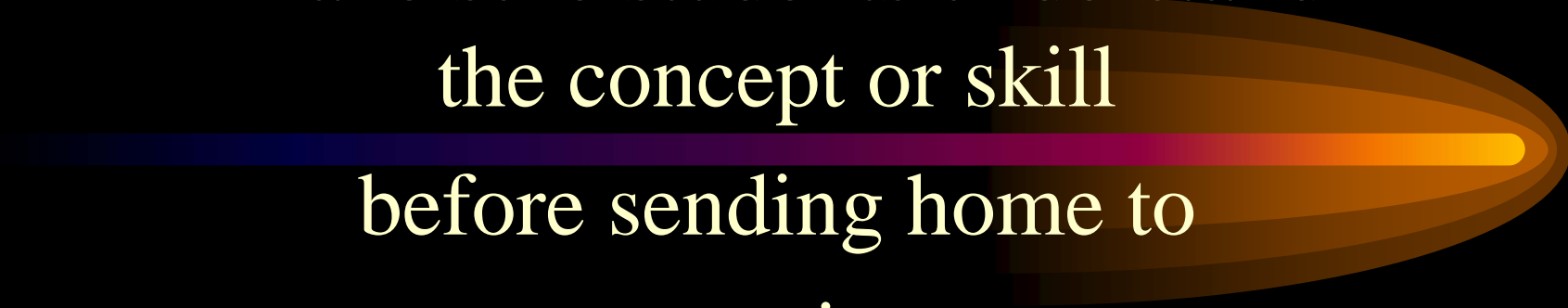


Homework



- Homework should reflect what you say you value.
 - Vocabulary & Notation
 - Conceptual Understanding & Linkage
 - Basic Facts & Procedures

Make sure students understand
the concept or skill
before sending home to
practice



Practice



- Guided
- Group
- Independent



Homework

Page 270, 1–32 odd

Homework-Studying

- Reading
- Thinking
- Reflecting
- Organizing
- Writing
- Analyzing
- Visualizing
- Reviewing
- Remembering
- Recalling



Homework

Read Sec. 9.4 - Expressions involving
logarithms

Define logarithm

Write a procedure for converting logarithms to
exponentials

Explain why when multiplying log with the same
base, you add the logs

$$\log (AB) = \log A + \log B$$

Page 270 1, 3, 6, 7, 9, 12, 13, 14, 21,23, 31



Homework



Read Sec 9.4 - Adding Fractions

Define Fraction

Draw a model for adding fractions

Write a procedure for adding fractions

Explain the link between adding fractions and
decimals

Page 270 1, 3, 6, 7, 9, 12, 13, 14, 21, 23, 31



Homework

Assignment Sheet

demonstrates thoughtful preparation



Homework check

- A quick look at the homework assignments suggest the care teachers take to reinforce the daily instruction to help students prepare for unit, semester and other high stakes tests.
- Star * System

4th Essential – Test Preparation





4th Essential- Test Preparation

Test what you say you value:

Instruction – Assessment – Balance

Questions reflecting other high-stakes tests

Cumulative questions

Practice tests - Parallel construction

Setting a date



Testing

Testing drives instruction



Tests

- Test Design
 - Design tests that encourage study.
 - Test what you say you value

Test Preparation

- Do you know what you are going to test your students on BEFORE you begin to teach a unit?
- Use the * System on notes, homework, and practice tests to to prepare for test

Practice Tests



- Parallel constructed; especially for students who have not experienced success in math.



Tests

Monitor student learning

Memory Aids



Help your students remember



5th Essential - Tests

Form A ~ Form B

Test Check



- Balanced assessment
- Cover the assigned curriculum/benchmarks
- Questions reflect other high stakes tests
- Grades are fair
- Grades are portable
- Parallel constructed



Tests



- Are test results a reflection of instruction?

Organizing Student Learning



Making the connection -

Instruction to

Note taking to

Homework to

Test preparation to

Tests

Organizing Student Learning



Helps students focus and study more effectively and efficiently resulting in increased student achievement

This organization strategy leads to



- Transparency
- Credibility
- Trust

“5 + 1” Summary

Student-teacher relationships

~parent communication~

- 1) Understanding instruction
- 2) Notes that reflect & reinforce instruction
- 3) Homework that supports and reflects instruction
- 4) Test preparation
- 5) Parallel constructed tests

What are you willing to do?





Next steps

- What are you willing to do to increase student achievement?
 - Explicitly go over expectations with staff in August; “5+1”
 - Parental communication
 - Observe instruction in September/October with emphasis on “5+1” and understanding
 - Collect grade distributions for 1st unit test
 - Conduct pre- and post- observation conferences within a week and provide meaningful suggestions, recommendations, or directions that improve instruction
 - Continue observations, conferences & monitor grade distributions



Next steps

- What are you willing to do to increase student achievement?
 - Create pre tests that reflect unit and other high stakes tests
 - Parental communication
 - Introduce new concepts and skills using concept development or linkage
 - Be more prescriptive & directive with notes that reflect instruction
 - Create homework assignments that encourage study
 - Use star * system in notes, homework & practice tests
 - Create parallel constructed tests



Recommended Next Steps

