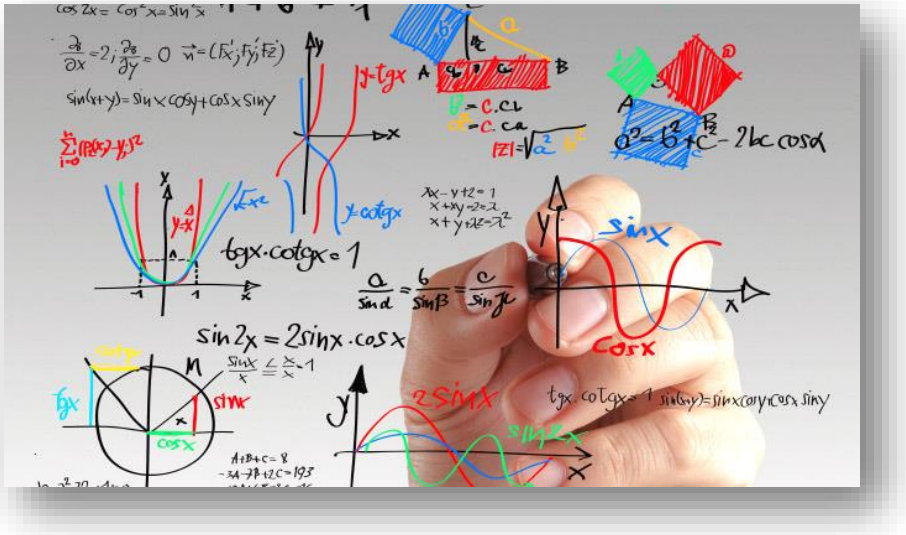
Rethink Literacy! 2.0



Incorporating Literacy Instruction in the Algebra 1 Classroom

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Rethink Literacy: 2.0
Literacy Instruction Across the Content Areas for 6th-8th Grades
Session Agenda

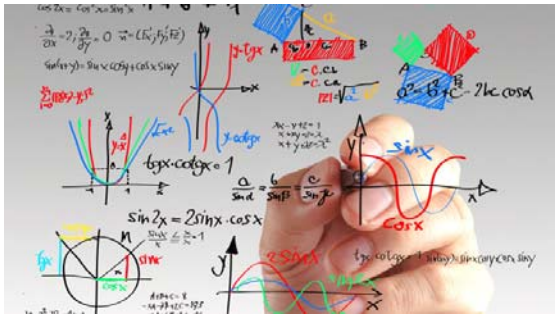
Morning Break is scheduled from 10:15-10:25 | Lunch on your own will be from 12:25-1:25

Concurrent Sessions	
ELA	**8:15-10:15** Session 1: Self-study Guide for Implementing Literacy Interventions (REL-SE)
	10:25-12:25 Session 2: Differentiated Instruction
	1:30-3:30 Session 3: Content-Driven Strategies for ELA: Fluency, Vocabulary, and Comprehension
Math	**8:15-10:15** Session 1: Differentiated Instruction
	10:25-12:25 Session 2: Self-study Guide for Implementing Literacy Interventions (REL-SE)
	1:30-3:30 Session 3: Content-Driven Strategies for Math: Fluency, Vocabulary, and Comprehension
Science	**8:15-10:15** Session 1: Differentiated Instruction
	10:25-12:25 Session 2: Content-Driven Strategies for Science: Fluency, Vocabulary, and Comprehension
	1:30-3:30 Session 3: Self-study Guide for Implementing Literacy Interventions (REL-SE)

INCORPORATING EFFECTIVE LITERACY STRATEGIES

IN THE ALGEBRA I CLASSROOM

Rethink Literacy! 2.0



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Division of Literacy
Office of Elementary Education and Reading
601-359-2586

Mississippi Department of Education

VISION

To create a world-class educational system that gives students the knowledge and skills to be successful in college and the workforce, and to flourish as parents and citizens

MISSION

To provide leadership through the development of policy and accountability systems so that all students are prepared to compete in the global community

State Board of Education Goals FIVE-YEAR STRATEGIC PLAN FOR 2016-2020

1. All Students Proficient and Showing Growth in All Assessed Areas
2. Every Student Graduates from High School and is Ready for College and Career
3. Every Child Has Access to a High-Quality Early Childhood Program
4. Every School Has Effective Teachers and Leaders
5. Every Community Effectively Uses a World-Class Data System to Improve Student Outcomes
6. Every School and District is Rated "C" or Higher

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Objectives

- Highlight literacy strategies that can be used to deepen students' conceptual understanding of key standards in the A-SSE domain

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Training Agenda

- Work Session #1: Literacy for All: Readers and Mathematics
- Work Session #2: Decoding Strategies in the Algebra I Classroom (A-SSE)
- Work Session #3: Fluency Strategies in the Algebra I Classroom (A-SSE)
- Work Session #4: Comprehension Strategies in the Algebra I Classroom (A-SSE)

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WORK SESSION #1:

LITERACY FOR ALL

READERS and MATHEMATICIANS

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Ponder a Moment

"A math teacher is a reading teacher… a reading teacher that teaches students to read math."

Agree or Disagree? Explain your reasoning.

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Voices from the Math Classroom

- "The students know how to do the math, they just don't understand what the question is asking."
- "The thing I don't like about this new series is the way the problems are stated; it's difficult for students to understand what is being asked of them."
- "I have to reword the questions for my students, and then they can do it."

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Literacy Defined

- The ability to identify, understand, interpret, create, compute, and communicate using visual audible, and digital materials across disciplines and in any context.

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Students Who Can't Read

- 126 million youth worldwide are illiterate.
- Students who can't read are not deficient because of a lack of book and print awareness or because they can't read the words on a page.
- Students who can't read

  - are not able to read words with enough fluency to facilitate comprehension.

  - lack strategies to help comprehend what they read.

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Literacy Challenges

- Reading math is different from reading a narrative:

Students generally read the words from left to right, while math may require students to read from left to right, right to left, top to bottom, bottom to top, and diagonally (e.g. order of operations, division, multiplication, etc.)

A sentence has a subject, predicated, and a verb; mathematical expression consists of variables and symbols that may have multiple or discrete meanings.

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Literacy Challenges

- Textbooks that are designed for students who possess on-grade level reading skills.
- Students frequently have to read and comprehend real-world problems.
- Students are frequently asked to justify or explain their solutions.

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Students Who Struggle with Math

Students who struggle with math often have not fully developed one or more of the following strands of mathematical proficiency:

- Conceptual understanding
- Procedural fluency
- Adaptive reasoning
- Productive disposition

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Decoding and Comprehension

Reading generally has two components:

- **Decoding** is the process that readers use to quickly and automatically translate letters, symbols, or spelling patterns of written words into speech sounds.
- **Comprehension** is the ability to actively listen, read, and understand language. To comprehend a text, students' decoding skills must allow for fluent reading.

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Mathematics for All

- Social norms that do not readily admit to not being able to read.
- Social norms that proclaim pride in the inability to perform even moderately complicated math problems.
- Poor math performance seemingly does not carry the same stigma as poor performance in reading.

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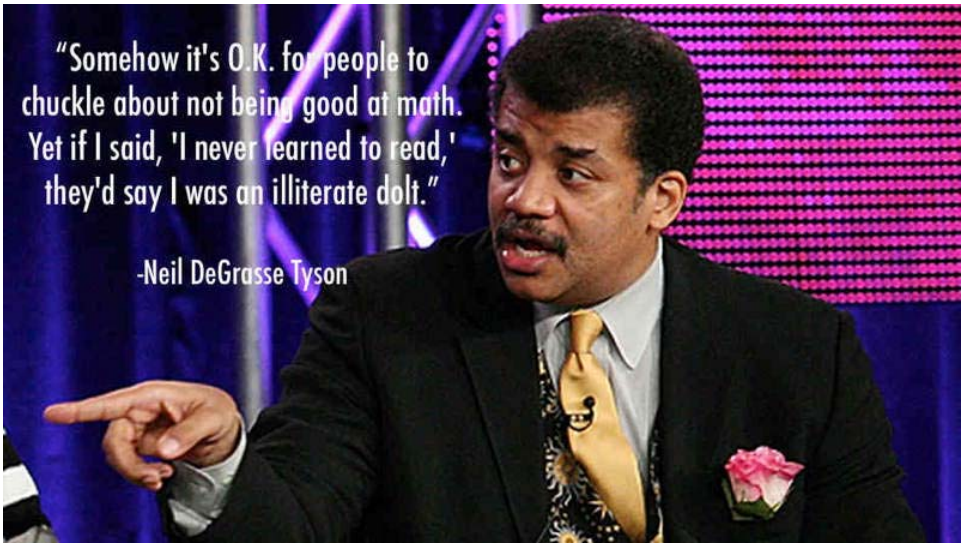
Mathematics for All



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Mathematics for All

Directions (1 of 2):

- Locate Handout #1: Problem-Solving Myths and remove it.
- With your group, read the introduction, complete the table, and discuss each column.

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Mathematics for All

Directions (2 of 2):

- In the column labeled “What I Can Do to Forget the Myth and Concentrate on the Truth”, describe what actions you might take as the teacher to support student learning.
- Be prepared to share out.

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Seeing Structure in Expressions

Seeing Structure in Expressions (A-SSE)	
Interpret the structure of expressions	
A-SSE.1	Interpret expressions that represent a quantity in terms of its context.* 1.Interpret parts of an expression, such as terms, factors, and coefficients. 2.Interpret complicated expressions by viewing one or more of their parts as a single entity. *For example, interpret $P(1 + r)^n$ as the product of P and a factor not depending on P.*
A-SEE.2	Use the structure of an expression to identify ways to rewrite it. *For example, see $x^4 - y^4$ as $(x^2)^2 - (y^2)^2$, thus recognizing it as a difference of squares that can be factored as $(x^2 - y^2)(x^2 + y^2)$.*

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Identifying the Struggling Learner for A-SSE

- Struggling learners may define the term “variable” as a quantity that changes or varies.
- Struggling learners may not

  - see expressions as constructions of basic operations.

  - have a dynamic view of expressions such that the potential arrangements and manipulations are not easily recognized.

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A-SSE Example 1

$$\frac{R_1 R_2}{R_1 + R_2} = \frac{1}{\frac{1}{R_1} + \frac{1}{R_2}}$$

$$(a - b)(a + b) = a^2 - b^2.$$

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A-SSE Example 2

$$\sqrt{ab} = \sqrt{a}\sqrt{b} \quad \text{for all positive } a, b$$

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A-SSE Example 3

$$\frac{x^2}{(3x^4+x+2)}+\frac{6}{(x^2+5)}$$

x^2, $3x^4+x+2$, 6, and x^2+5

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A-SSE Example 3 Continued

$$\frac{a}{b}+\frac{c}{d}=\frac{ad+cb}{bd}$$

$$\frac{x^2}{(3x^4+x+2)}+\frac{6}{(x^2+5)}=\frac{x^2(x^2+5)+6(3x^4+x+2)}{(3x^4+x+2)(x^2+5)}$$

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Supporting the Struggling Learner

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Literacy for All

Struggling, EL, and Gifted learners all benefit from:

- creating vocabulary banks.
- using graphic organizers.
- using manipulatives and games.
- teachers speaking slowly, with clear articulation.
- visual cues and prompts.

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WORK SESSION #2:

DECODING STRATEGIES

IN THE ALGEBRA I CLASSROOM
(A-SSE)

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Decoding in Mathematics

What We Decode in Reading	What We Decode in Doing Math
Words	•Quantities associated with numerals and place value •Graphs •Symbols (<, >, + , +, %, etc.) •Mathematical Notations (e.g. geometry, measurement, trigonometry, calculus, etc.)

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Unpacking the CCRS

Review the focus standards on slide 21. What are students expected to know, understand, and be able to do?

(The Scaffolding Document can be used for this.)

Record your response on the chart paper provided.

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A-SSE Decoding Basics

Students should understand that

- expressions, equations, and functions are different mathematical concepts.

- complicated expressions are compositions of simpler expressions.

- expressions can be sums of terms or products of factors.

- terms are separated by operations (+) and (-) in an expression.

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A-SSE Decoding Basics

Students should understand that

- terms are parts of an expression, usually numbers or variables, or number and variables multiplied together.

- a variable is an element in the domain of a function, and the domain can be finite or infinite.

- a letter *x* can stand for a number in the same way that the pronoun "he" can stand for a man.

- for any expression, *x* is a number.

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A-SSE Decoding Basics

Students should understand that

- a coefficient is the non-variable used to multiply a variable.

- constants are well-defined, having a fixed value.

- the simplest form may be desirable for a given purpose.

- transformations of expressions into equivalent forms can be suitable for the purpose of a mathematical task (e.g. there are three commonly used forms for a quadratic expression.)

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Ponder a Moment

Research revealed that 80% of comprehending is tied to understanding the vocabulary.

Agree or disagree? What implications might this finding have on teaching and learning mathematics?

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Tiered Vocabulary

- **Tier 1** words are those basic words used regularly and generally learned without instruction (e.g. boy, number, book, pencil)
- **Tier 2** words are high frequency words for mature users (e.g. term, similar, translate)
- **Tier 3** words are domain specific and not otherwise frequently used in other content areas (e.g. perpendicular, gradient, coefficient)

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Tiered Vocabulary Acquisition

Explicit Instruction or Incidental Acquisition

1. Explicit Instruction

   - Modeling, explaining, and guiding student thinking.

   - This strategy is best used for Tier 2 words.

2. Incidental Acquisition

   - Incidentally through the conscious or unconscious use of context clues during reading and listening activities

   - This strategy is best used for Tier 3 words.

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Classifying Vocabulary

As a group, classify the words on the following slide as Tier 2 or Tier 3.

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A-SSE Vocabulary

- Factors
- Root
- Solution
- Commutative Law of Addition/Multiplication
- Associative Law of Addition/Multiplication
- Distributive Law of Multiplication Over
- Addition
- Variable
- Constant
- Number line
- Equations of one/two variable(s)
- Expressions
- Equation
- Coefficient
- Term

Additional words can be considered.

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Supporting the Struggling Learner

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Mathematics Word Walls

Mathematics word walls can

- provide an approach to the meaningful teaching of vocabulary with an emphasis on student engagement and higher order thinking skills
- reinforce students' understanding of math words.
- help students improve spelling and awareness of spelling patterns.
- provide visual cues to students.

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Pocket Book for Mathematics

- Before starting a new lesson, identify the key vocabulary terms and mathematical concepts.
- On the first day of the lesson, write the vocabulary terms and mathematical concepts on the board.
- Students write all the terms and concepts on index cards.
- The students may define as many terms as possible before the lesson begins.

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Pocket Book for Mathematics

- Students then sort the terms by “know” and “need to know”.
- Students may revisit the words throughout the unit of study.
- Words may be moved from pocket to pocket.
- Struggling learners may be provided “fill in the blank cards” with the word and a visual cue prior to sorting.

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Pocket Book for Mathematics

Directions 1 of 3:

- Locate Handout #2: Pocket Book Activity, one sheet of construction paper, four index cards, and colored pencils in the center of the table.
- Read the directions from the handout to construct your pocket book.
- Label the left pocket “Know/Learned” and label the right pocket “Need to Know”.

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Pocket Book for Mathematics

Directions 2 of 3:

- From the A-SSE vocabulary list, choose two words that you might know, and two words that you "need to know."
- Write each word on a separate index card.
- On each card, write what you know and/or understand about the word.

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Pocket Book for Mathematics

Directions 3 of 3:

- Demonstrate how a student might place the cards in each pocket.
- Be prepared to share out.

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One-Minute Schema

Directions 1 of 2:

- Locate Handout #3: One-Minute Schema and remove it.
- At the top of the left column, write the word “variable”.
- At the top of the right column, write the word “term.”

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One–Minute Schema

Directions 2 of 2:

- You will have 60 seconds to record as many thoughts, ideas, and examples as you can about each word.
- Be prepared to share out.

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Card Sort

Directions 1 of 1:

- Locate the bag labeled “Word Work” in the center of the table and remove the cards.
- Locate the large sorting mat and an index card in the center of the table.
- With your group, choose a mathematical criteria to sort the cards.
- Record the mathematical criteria used on an index card.
- Be prepared to share out.

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These Are… These Are Not!

Directions 1 of 1:

- Locate the bag labeled “Word Work” in the center of the table and remove the cards.
- Locate the large two-column graphic organizer card in the center of the table.
- With your group, choose a mathematical criteria to sort the cards into two groups, “These Are” and “These Are Not.”
- Record the mathematical criteria used on an index card.
- Be prepared to share out.

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Tic-Tac-Toe

Directions 1 of 2:

- Locate the bag labeled Tic-Tac-Toe in the center of the table and remove its contents
- Each player will select a color counter (i.e. red or yellow)
- Each player takes a turn describing some aspect of an expression using a word from A-SSE vocabulary list.
- Once a word is used it may not be used by any other player during the game.

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Tic-Tac-Toe

Directions 2 of 2:

- The first player to get three in a row or diagonally wins the game.
- Be prepared to share out.

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Charades

Directions 1 of 1:

- Each group will select one player to start the game.
- The player will select a A-SSE vocabulary word from the deck of words held by the facilitator.
- The player will then pantomime the word or phrase chosen to the audience.
- The groups will have 60 seconds to guess the word or phrase correctly!

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Ponder a Moment

- How might I extend the decoding strategies in this work session to other topics in Algebra I?

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WORK SESSION #3:

FLUENCY STRATEGIES

IN THE ALGEBRA I CLASSROOM
(A-SSE)

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Fluency in Mathematics

- What does it mean to be fluent in Math? What indicators do you look for in students to identify whether or not they are fluent?

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Fluency in Mathematics

- The ability to quickly compute or rapidly recall facts is insufficient.
- Students find it difficult mathematically because they struggle with computation and facts.
- Truly fluent students arrive at a solution and decide on their own if it is reasonable.
- Mental energy is placed on noticing patterns, making generalizations, conjectures, and tackling multistep word problems.

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Fluency in Mathematics

- Be sure to address serious problems that may exist in foundational understanding.
- Students need a good sense of numbers and recall of basic facts.
- Make sure students have the opportunity to do work that challenges them.
- Students build fluency (and corresponding confidence) when they meet challenges, and experience success often.

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A-SSE Fluency Basics

- Students should understand that

  -operations for building expressions include addition, subtraction, multiplication, division, and work with exponents.

  - seeing structure in expressions entails a dynamic view of algebraic expression, in which potential rearrangements and manipulations are ever present.

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Graphics Organizers in Mathematics

Graphic organizers are

- used to organize information visually
- scaffold learning
- best used as conceptual tools, rather than a way for students to express what they have learned.

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Supporting the Struggling Learner

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Types of Operations

Directions 1 of 1:

- Locate Handout #4: Types of Operations and remove it.
- With a partner, read the introduction and complete the diagram.
- Be prepared to share out.

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Properties of Operations

Directions 1 of 1:

- Locate Handout #5: Properties of Operations and remove it.
- With a partner, read the introduction and complete the table.
- Be prepared to share out.

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Roles of Variables

Directions 1 of 1:

- Locate Handout #6: Roles of Variables and remove it.
- With a partner, read the introduction and complete the diagram.
- Be prepared to share out.

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Modeling Expressions with Algebra Tiles

Algebra tiles can support student's ability to:

- develop an initial conceptual understanding of different uses of variables.
- Use symbolic algebra to represent situations and to solve problems, especially those that involve linear relationships.
- Recognize and generate equivalent forms for simple algebraic expressions and solve linear relationships.

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Modeling Expressions with Algebra Tiles

- There will be an initial investment of classroom time that will pay dividends later as students continue their study of Algebra.
- The models constructed are extendable for other algebraic concepts; therefore, additional, classroom time will not be needed as students use Algebra Tiles to explore these concepts.

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Algebra Tiles 101

- The x^2 tile is a square whose sides have a length and width of ***x*** each.

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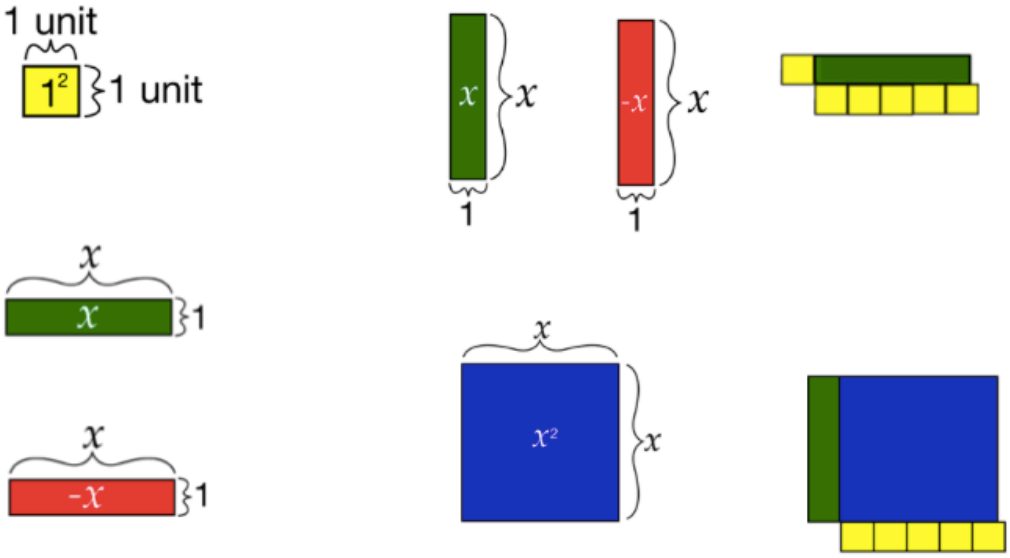
Algebra Tiles Review



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Algebra Tiles 101

The red Algebra Tiles are additive inverse for their corresponding tiles. When used together, a 'zero pair' is created.

Directions:

On a Post-it note, use color pencils/markers to show the 'zero pair' for each Algebra Tile.

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Practice

What expression is modeled below?

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Practice

Use your Algebra Tiles to model the expression **4 (x-3)**

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Modeling Expressions with Algebra Tiles

Directions 1 of 1:

- Locate Handout #7: Modeling Expressions and remove it.
- Locate a set of Algebra Tiles in the center of the table.
- With a partner, use your Algebra Tiles to complete the chart.
- Be prepared to report out.

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Ponder a Moment

How might I extend the fluency strategies in this Work Session to other topics in Algebra I?

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WORK SESSION #4:

COMPREHENSION STRATEGIES

IN THE ALGEBRA I CLASSROOM
(A-SSE)

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Reading Comprehension

Reading Comprehension is an intentional, active interactive process that occurs before, during, and after a person reads a particular piece of writing. Simply put, reading comprehension is the act of understanding what you are reading.

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Simile Me Reflection

Reading comprehension in mathematics is like _____ because _____.

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Walk It Out

Directions 1 of 1:

- Line up in two rows facing each other.
- Share your Simile with the person in front of you.
- Row 1 rotates 2 to the right.
- Repeat.

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Comprehension in Mathematics

- Decoding, fluency, and vocabulary are all essential to success in literacy and mathematics, but alone are insufficient for comprehension.
- Decoding and comprehension are inseparable.

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Before, During, and After Reading Instructions

Before Reading Strategies

- Making connections
- Monitoring meaning
- Questioning

During Reading Strategies

- Making connections
- Questioning
- Visualizing
- Inferring
- Summarizing

After Reading Strategies

- Summarizing
- Synthesizing

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A Closer Look at Reading Strategies

- Making connections: using schema and background knowledge.
- Questioning: generating questions before, during, and after reading to clarify understanding.
- Visualizing: using sensory and emotional images to deepen and expand meaning.

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A Closer Look at Reading Strategies

- Inferring: using background knowledge with new information to predict, conclude, make judgements, or interpret.
- Summarizing: deciding what information is significant
- Synthesizing: creating new ideas or extending/revising understanding based on engagement with the text or mathematical observation/investigation.

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A Closer Look at Reading Strategies

- Monitoring meaning: thinking about the degree of understanding and taking the steps to improve understanding when necessary.

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Making Connections

In mathematics, we teach students what it feels like to understand the math that they do—and how they can develop it:

Math-to-Self: connections relate unfamiliar mathematical material to personal experiences.

Math-to-Math: connections emphasize the interconnectedness of mathematical concepts to learn new material.

Math-to-World: connections integrate what students know about the world around them.

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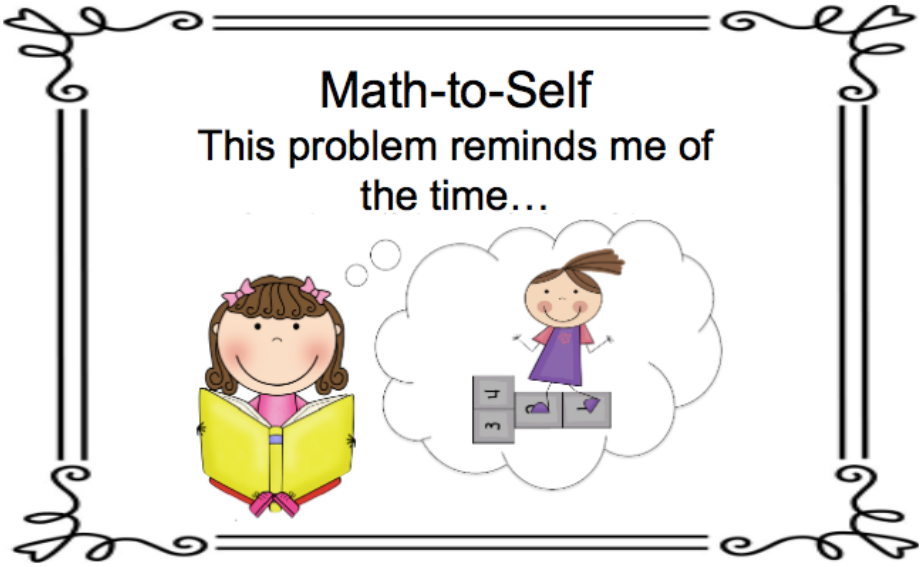
Making Connection



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Making Connections

Math-to-Math

This problem reminds me of a different problem…

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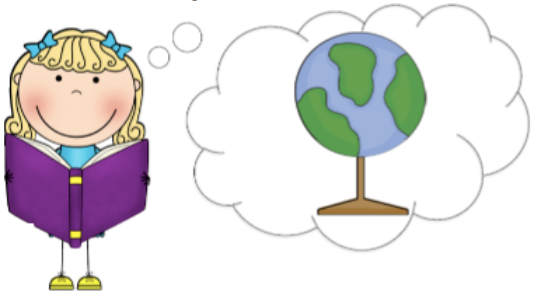
Making Connections

Math-to-World

This problem is a real problem I could experience in life…



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Visualizing

- Visualizing is a way to enhance the ability to infer and monitor meaning.
- Proficient math students use sensory to connect to the math they are doing.
- Students may use a mental number line, place value charts, stories, or their fingers.
- Students need support when they are creating appropriate images they may have to call later.

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Supporting the Struggling Learner

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Comprehension in Mathematics

Directions (1 of 3):

- Locate Handout #8: Ten Tab Foldable and remove it.
- Use your scissors to cut along the perimeter of the foldable.
- Fold the anchor tab.
- Glue the anchor tab onto cardstock paper before cutting along the dotted lines.
- Use your scissors to cut along the dotted lines to form "information" tabs.
- Read the task on the following slide.

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Comprehension in Mathematics

Task

Suppose P and Q give the sizes of two different animal populations, where Q>P. In (a)-(f), say which of the given pair of expressions is larger. Briefly explain your reasoning in terms of the two populations.

a. $P+Q$ and $2P$	d. $P+50t$ and $Q+50t$
b. $\frac{P}{P+Q}$ and $\frac{P+Q}{2}$	e. $\frac{P}{P+Q}$ and 0.5
c. $\frac{Q-P}{2}$ and $Q-\frac{P}{2}$	f. $\frac{P}{Q}$ and $\frac{Q}{P}$

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Comprehension in Mathematics

Directions (2 of 3):

- Write each sentence of the task on a different tab until the entire task is deconstructed.
- Complete the problem “one sentence at a time.”
- Use the inside tab record any pertinent information gained from reading the sentence.
- Discuss how reading the task one sentence at a tie might increase students’ mathematical comprehension.
- Be prepared to share out.

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Comprehension

Directions (3 of 3):

- Discuss how reading the task one sentence at a tie might increase students’ mathematical comprehension.
- Be prepared to share out.

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Ponder a Moment

How might I extend the comprehension strategies in this work session to other topics in Algebra I?

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Two-Dollar Summary

Reflect on the literacy strategies from today's training.

Write a two-dollar(or more) summary of today's training session. Each word is worth 10¢.

(Teacher Tip: Ask students to include specific words in their statement.)

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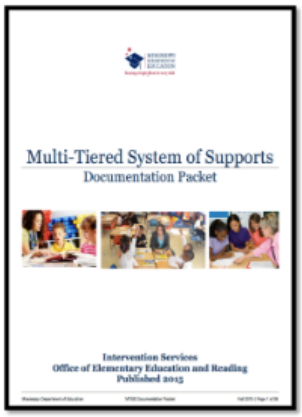
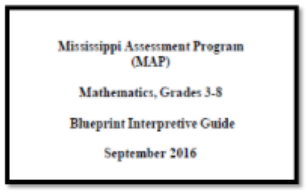
Resources & Publications for Math Teachers

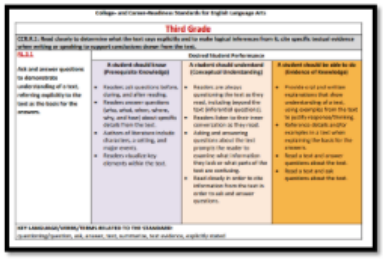


Multi-Tiered System of Supports
PK-12

Assessment Blueprints and Guides
3-HS



Instructional Scaffolding Document
PK-Algebra II



2016 MS CCRS for Mathematics
K-12

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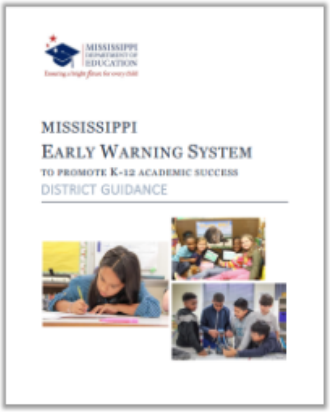
Resources & Publications for Administrators

On Demand PD & Technical Assistance
K-12



Early Warning System
College and Career Readiness Data
Guidance Document

Mississippi Educator & Administrator Professional Growth System

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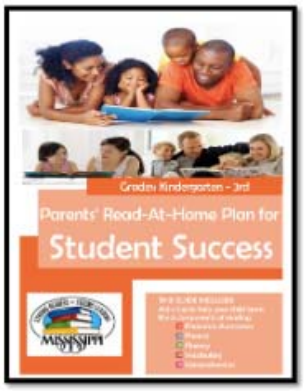
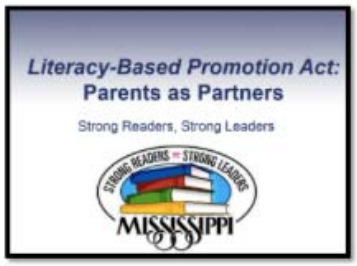
Resources & Publications for Parents

Family Guides for Student Success
PK-8



Parents' Read-At-Home Plan
LBPA Parent Document



Parents As Partners
LBPA
Parent Presentation

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DIFFERENTIATING INSTRUCTION

STRATEGIES FOR MEETING STUDENTS' INDIVIDUAL NEEDS

Rethink Literacy! 2.0

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Division of Literacy
Office of Elementary Education and Reading
601-359-2586

Mississippi Department of Education

VISION

To create a world-class educational system that gives students the knowledge and skills to be successful in college and the workforce, and to flourish as parents and citizens

MISSION

To provide leadership through the development of policy and accountability systems so that all students are prepared to compete in the global community

State Board of Education Goals FIVE-YEAR STRATEGIC PLAN FOR 2016-2020

1. All Students Proficient and Showing Growth in All Assessed Areas
2. Every Student Graduates from High School and is Ready for College and Career
3. Every Child Has Access to a High-Quality Early Childhood Program
4. Every School Has Effective Teachers and Leaders
5. Every Community Effectively Uses a World-Class Data System to Improve Student Outcomes
6. Every School and District is Rated "C" or Higher

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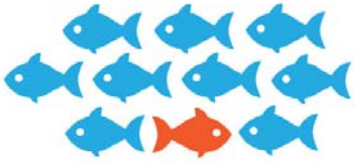
Session Norms

- Silence your cell phones
- Please check and/or reply to emails and texts during the scheduled breaks
- Be an active participant
- Do not hesitate to ask questions



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Session Goals

- Review the meaning of **Differentiated Instruction**
- Discuss how to **tier instruction for differentiation**
- Implement and practice **differentiated instructional strategies**

Opening Activity

Find others who have the same number as you. In your group, answer the following questions. *Be prepared to share out!*

- What **IS** differentiated instruction? What **IS NOT** differentiated instruction?
- What differentiated instruction strategies have you seen used or have you used in your own classroom?
- Why might teachers be hesitant to include differentiated instruction in their classrooms?

WHAT IS DIFFERENTIATED INSTRUCTION?

Meeting Individual Needs

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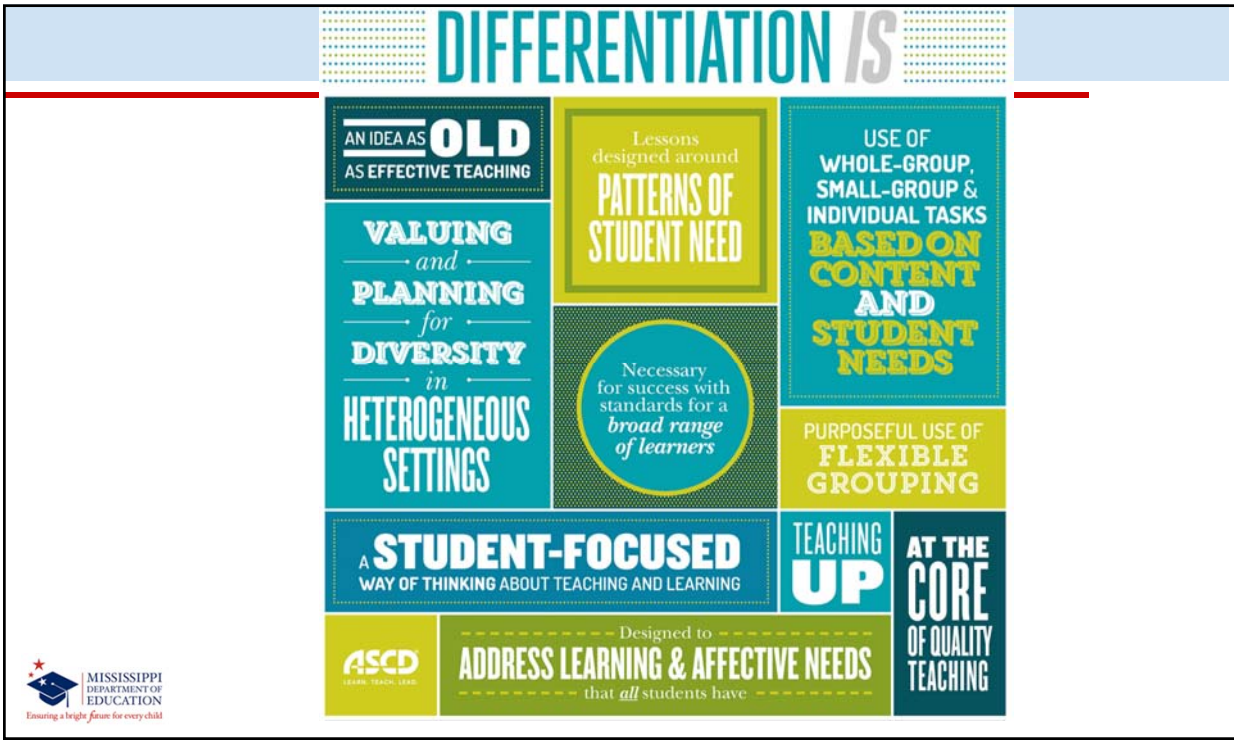

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What is Differentiated Instruction?

Differentiation means tailoring instruction to meet individual needs. Whether teachers differentiate content, process, products, or the learning environment, the use of ongoing assessment and flexible grouping makes this a successful approach to instruction.

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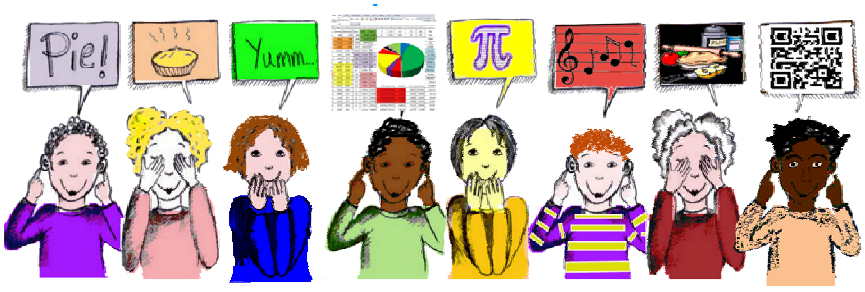
What is Differentiated Instruction?

At its most basic level, differentiation consists of the efforts of teachers to respond to variance among learners in the classroom. *Whenever a teacher reaches out to an individual or small group to vary his or her teaching in order to create the best learning experience possible, that teacher is differentiating instruction.*

Differentiating the Content

Teachers can differentiate at least four classroom elements based on student readiness, interest, or learning profile:

1) Content – what the student needs to learn or how the student will get access to the information



Differentiating the Content

Examples of differentiating content include the following:

- Providing students with choices in order to add depth to learning;
- Provide students with additional resources that match their levels of understanding
- Pre-assess student skills and understandings, then match with appropriate activities
- Present essential facts and skills

Differentiating the Process

Teachers can differentiate at least four classroom elements based on student readiness, interest, or learning profile:

2) Process – activities in which the student en order to make sense of or master the content

Differentiating the Process

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Differentiating the Process

Examples of differentiating processes or activities include the following:

- Using tiered activities through which all learners work with the same important understandings and skills, but proceed with different levels of support, challenge, or complexity;
- Developing personal agendas (task lists written by the teacher and containing both in-common work for the whole class and work that addresses individual needs of learners) to be completed either during specified agenda time or as students complete other work early;
- Develop activities that reflect student learning styles and preferences

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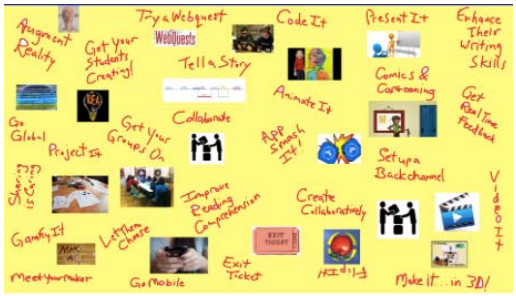
Differentiating the Products

Teachers can differentiate at least four classroom elements based on student readiness, interest, or learning profile:

3) Products – culminating projects that ask the student to rehearse, apply, and extend what he or she has learned in a unit



Differentiating the Products

Examples of differentiating products include the following:

- Giving students options of how to express required learning (e.g., write a report, take a test, create a brochure, write a speech, produce a skit);
- Using rubrics that match and extend students' varied skills levels;
- Allowing students to work alone or in small groups on their products; and
- Encouraging students to create their own product assignments as long as the assignments contain required elements.

Differentiating the Learning Environments

Teachers can differentiate at least four classroom elements based on student readiness, interest, or learning profile:

4) Learning Environment – the way the classroom works and feels

Differentiating the Learning Environments

Examples of differentiating learning environments include the following:

- Ensuring there are places in the room to work quietly and without distraction, as well as places that invite student collaboration;
- Providing materials that reflect a variety of cultures and home settings;
- Setting clear guidelines for independent work that matches individual needs;
- Developing routines that allow students to get help when teachers are busy with other students and cannot help them immediately; and
- Helping students understand that some learners need to move around to learn, while others do better sitting quietly

Differentiated Instruction Table Activity

As a table, **choose one of the following classroom elements**.
Discuss how you would differentiate instruction in that area.
Be ready to share!

1) Content – what the student needs to learn or how the student will get access to the information
2) Process – activities in which the student engages in order to make sense of or master the content
3) Products – culminating projects that ask the student to rehearse, apply, and extend what he or she has learned in a unit
4) Learning Environment – the way the classroom works and feels

UTILIZING COMMON ASSESSMENT DATA TO PLAN

TIERED INSTRUCTION

Step 1: Record Results by Standard

Following a common assessment, use the test blueprint to record student results by standard assessed to provide a clear picture of student understanding.

Analyzing Individual Student Common Assessment Data
ELA 2nd 9 Weeks

- Use the Objective Level Report and write in the standards assessed on the 2nd 9 weeks CA.
1. List your students' names for your homeroom.
2. Look at their objective report and write the percentage for each standard
3. For each standard, highlight 60% and above green and below 60% pink.

Student Names/Overall Total						Language Total								Lit Total									Info Total

Office of Elementary Education and Reading

A Note on Scaffolding Instruction

By identifying standards students struggled with, teachers can use the scaffolding document to understand where students might have gaps or be ready for more advanced content, allowing them to better plan tiered instruction.

Using the Scaffolding Document….

1. Locate the 2 weakest standards from Common Assessment that you chose above.

2. Identify the gaps…..Look at the evidence column on the SD for that standard. Which piece of evidence did the students not master?
   Standard _____
   _____
   Standard_____
   _____

3. Next steps/Strategies- What are our next steps to ensure these standards are mastered and the gaps are closed?

_____
_____
_____
_____
_____

Office of Elementary Education and Reading

Step 2: Group Students for Tiered Instruction

Using data from the previous chart, identify students who scored below 60% for each standard and record their names. This creates a grouping system to assist in planning tiered tasks and small group intervention support.

Students below 60% Standard_____	Students below 60% Standard_____	Students below 60% Standard_____	Students below 60% Standard_____	Students below 60% Standard_____	Students below 60% Standard_____	Students below 60% Standard_____	Students below 60% Standard_____	Students below 60% Standard_____
Students below 60% Standard_____	Students below 60% Standard_____	Students below 60% Standard_____	Students below 60% Standard_____	Students below 60% Standard_____	Students below 60% Standard_____	Students below 60% Standard_____	Students below 60% Standard_____	Students below 60% Standard_____

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What is tiered instruction?

Tiered instruction is making slight adjustments within the same lesson to meet student needs. This includes, but is not limited to:

- Level of complexity
- Amount of structure
- Time allowed
- Number of steps required for completion
- Form of expression (letter, essay, report, research paper, short story, speech)
- Pacing of the assignment
- Materials provided
- Level of independence required

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Planning a Tiered Instruction Lesson

Step 1:
Identify the key concepts, skills, and essential understandings all students need to achieve.

Step 2:
Identify how to cluster groups/activities. There can be multiple levels of tiers, but the number of levels need to be consistent with the tier groups students are currently in.

Planning a Tiered Instruction Lesson

Step 3:
Select the elements to tier.

- Tier by **challenge level** using Bloom's Taxonomy
- Tier by **complexity** by addressing the needs of students at all levels, introductory to advanced
- Tier by **resources** by choosing materials at various reading levels and content complexities
- Tier by **outcomes** by having students use the same materials to develop various end products
- Tier by **process** by having students come to the same end product in their own different ways
- Tier by **product** by grouping students by intelligences or learning styles followed by assignments which fit their preferences

Planning a Tiered Instruction Lesson

Step 4:
Create your on-level tier.

Step 5:
Design a similar task for struggling learners where adjustments are based on student readiness.

Step 6:
If needed, develop a third, more advanced activity for learners who have already mastered the basic standard or competency. This task needs to require more higher-level thinking than the on-level task. Remember that the advanced tier should not be more repetitions or longer assignments of the same on-level task.

DIFFERENTIATED INSTRUCTION ACTIVITIES

Differentiated Instruction Strategies - MENU

Menus

1. Identify the most important element of the lesson or unit
2. Develop a required assignment or project that covers the minimum understanding all students are expected to achieve
3. Create negotiables that expand upon the “main dish” (required assignment) which require students to synthesize, analyze, or evaluate.
4. Create a final optional section for enrichment. This section can be used for extra credit.

Differentiated Instruction Strategies - MENU

Menus

	Overview
Appetizers (Negotiables)	- A list of assignments or projects where students need to synthesize, analyze, or evaluate (Choose 1)
The Main Dish (Imperatives)	- The assignment or project everyone must complete
Side Dishes (Imperatives)	- A list of assignments or projects where students need to synthesize, analyze, or evaluate (Choose 2)
Desserts (Extension Options)	- Optional (but irresistible!) high-interest and challenging assignments or projects (Choose 1)

Differentiated Instructional Strategies - MENU

Main Dish	Side Dish	Dessert
You must complete all items to earn a C.	You must complete one to earn a B. You must complete two to earn an A.	Complete one for an A.
- Create a list of 10 pairs of events. 5 pairs should contain dependent events, the other 5 pairs should contain independent events. Explain each classification. - Examine the attached list of functions and determine which functions represent probability distributions.	- Work with a partner to analyze the game of "Primarily Odd." See your teacher for game cubes. - Design a game spinner with this probability distribution: P(red)=0.1; P(green)=0.2; P(blue)=0.3; P(yellow)=0.4	- Figure the probability of "Murphy's Law" and make a case for whether or not it should indeed be a "law." - Use a frequency table to chart the colors that your classmates wear for a week. Then, use probability to predict how many students will wear a certain color on a given day.

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MENU Activity

Work with your table group to create menu items based on an upcoming unit to complete the template:

Main Dish	Side Dish	Dessert
You must complete all items to earn a C.	You must complete one to earn a B. You must complete two to earn an A.	Complete one for an A.

Differentiated Instructional Strategy - CUBING

Group Discussion and Cooperative Learning Strategies:

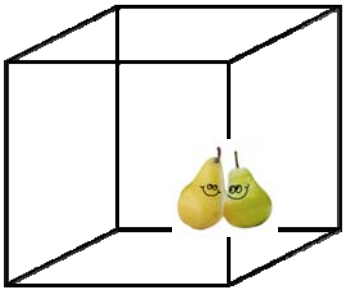
Think-Pair-Share

- What is the benefit of the Menu?
- What additional planning does the classroom teacher need to do to begin using the Menu?
- How do you expect to see students respond to the Menu?

Differentiated Instructional Strategy - CUBING

Cubing

- Introduce by applying to a familiar object, such as a candy.
- Have students work in groups or pairs.

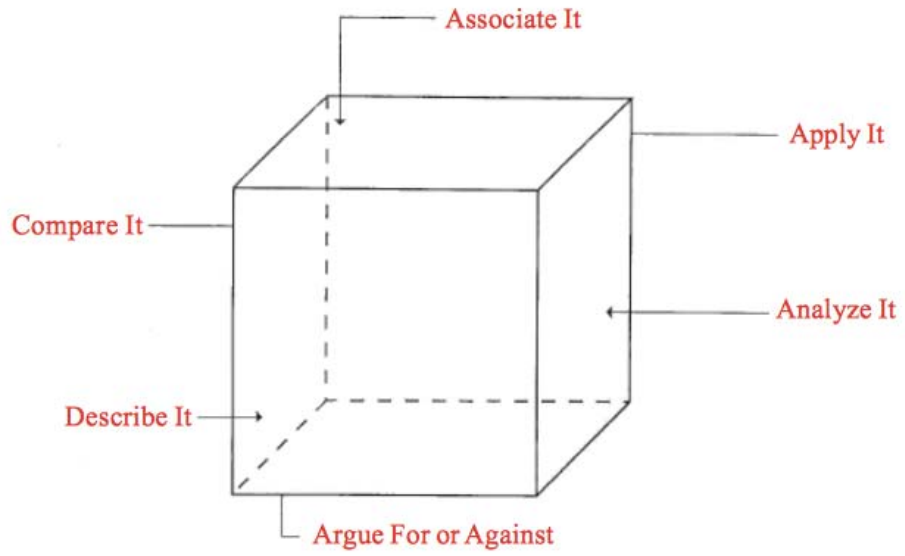


Differentiated Instructional Strategy - CUBING

Cubing

- **Describe It** – What does it look like?
- **Compare It** – Compared to something else, what is it similar to or different from?
- **Associate It** – What do you associate it with? What does it make you think of?
- **Analyze It** – What are its parts? How is it made?
- **Apply It** – What can you do with it? How can you use it?
- **Argue For or Against It** – Present an argument. Give students 10 minutes to build a mini-presentation and share out.

Differentiated Instructional Strategy - CUBING



Differentiated Instructional Strategy Cubing Activity

CHOOSE ONE OBJECT:

Describe It – What does it look like?

Compare It – Compared to something else, what is it similar to or different from?

Associate It – What do you associate it with? What does it make you think of?

Analyze It – What are its parts? How is it made?

Apply It – What can you do with it? How can you use it?

Argue For or Against It – Present an argument.

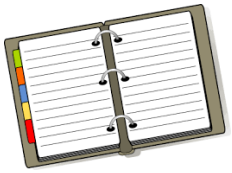


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Table Talk Activity

Group Discussion and Cooperative Learning Strategies:

Numbered Heads Together

- What planning needs to be done by the teacher prior to using the cube strategy?
- How can the cube be used across content areas to differentiate instruction?
- How could the cube be used for both group and independent work?

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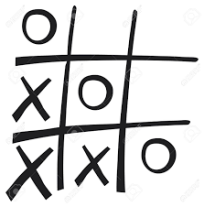
Differentiated Instructional Strategy – Tic Tac Toe

Tic-Tac-Toe

- Identify the instructional focus of a unit of study
- Use assessment data and student profiles to determine student readiness, learning styles, and interests
- Design nine different tasks
- Arrange the tasks on a choice board
- Select one task required for all students and place it at the center



- Students complete three tasks, one of which must be the task in the middle square, completing a Tic-Tac-Toe row

Differentiated Instructional Strategy – Tic Tac Toe

Tic-Tac-Toe Adaptations

- Allow students to complete any three tasks, even if they don't make a Tic-Tac-Toe
- Assign students tasks based on their readiness, or create different choice boards based on readiness
- Create choice board options based on learning styles or learning preferences (Example: a choice board could include three kinesthetic tasks, three auditory tasks, and three visual tasks)

Differentiated Instructional Strategy – Tic Tac Toe

Tic-Tac-Toe Example

Interpersonal Task	Kinesthetic Task	Naturalist Task
Logical Task	Student Choice	Intrapersonal Task
Interpersonal Verbal Task	Musical Task	Verbal Task

Rick Wormeli

Differentiated Instructional Strategy – Tic Tac Toe

Draw a right triangle and label the right angle, legs, and hypotenuse. State the relationship of the sides of a triangle.	Name a career in which one would have to use the Pythagorean Theorem. Give an example of when, where, and how it would be used.	Design a teaching tool with a diagram of a proof of the Pythagorean Theorem. Label it for all to understand.
Create 4 real world problems that would need the use of the Pythagorean Theorem. Show the solutions.	**Unit Test**	Determine a set of 8 Pythagorean "TRIPLES." Prove them with equations.
Write a descriptive essay about Pythagoras: his life, accomplishments, and failures.	Find another mathematical theorem. State it, diagram its proof, and write a paragraph about why, how and where it works.	Complete the Practice Problems found at this: http:regentsprep/Regents/math/fpyth/PracPyth.htm

Tic Tac Toe Activity

Work with your table group to develop a Tic-Tac-Toe board based on an upcoming unit. Record on the chart paper. Be prepared to share out!

Table Talk Activity

Group Discussion and Cooperative Learning Strategies:

Tea Party

- What is your previous interaction with “Tic-Tac-Toe” in the classroom?
- How can Tic-Tac-Toe be used as a differentiated instruction tool?
- How do you see yourself using this strategy in your classroom?

Differentiated Instructional Strategy - TECH

Technology Benefits

- Multimedia reaches multiple senses
- Multimedia projects validate self-expression
- Technology gives a sense of ownership to the user
- Multimedia creates an active rather than passive atmosphere for learning
- Technology fosters communication among students, as well as between students and teachers

Table Talk Activity

Technology Activity

- Discuss technology resources you currently use in your classroom or school.
- Record the resources on the anchor chart paper.
- Be prepared to share a brief synopsis of your favorite technology tool and how it benefits differentiated instruction.

In Closing, WHY Differentiated Instruction?

Gina Biancarosa and Catherine Snow (2004), authors of Reading Next, point to a statistic that should cause all middle grade, middle school, and high school educators to rethink their instructional practices. They note:

"A full **70 percent of U.S. middle and high school students require differentiated instruction**, which is instruction targeted to their individual strengths and weaknesses."

Exit Ticket

- List **THREE** things you remember from this session.
- Share **TWO** examples of something you would like to try.
- Write down **ONE** question on a post-it note that you would have like more information on.

Sources

"Literacy Strategies: Cubing." *Literacy and Learning: Reading in the Content Areas.* Louisiana Public Broadcasting, Baton Rouge, LA. 26 June 06 http://www.litandlearn.lpb.org/strategies/strat_cubing.pdf

Tomlinson, Carol Ann. *The Differentiated Classroom: Responding to the Needs of All Learners.* Alexandria, VA: ASCD, 1999.

Tomlinson, Carol Ann, and Jay McTighe. *Integrating Differentiated Instruction and Understanding by Design: Connecting Content and Kids.* Alexandria, VA: ASCD, 2006

Witherell, Nancy L., and Mary C. McMackin. *Graphic Organizers and Activities for Differentiated Instruction in Reading.* New York: Scholastic, 2002.

Wormeli, Rick. *Fair Isn't Always Equal: Assessing & Grading in the Differentiated Classroom.* Portland, ME: Stenhouse, 2006.

Resources

Reading Rockets *"What is Differentiated Instruction?"*
http://www.readingrockets.org/article/what-differentiated-instruction
Strategies That Differentiate Instruction (Grades 4 and 5)
http://education.ky.gov/educational/diff/Documents/StrategiesThatDifferentiateInstruction4.12.pdf
Cooperative Learning Instructional Strategies
http://www.teach-nology.com/currenttrends/cooperative_learning/
6 Strategies for Differentiated Instruction in Project-Based Learning
https://www.edutopia.org/blog/differentiated-instruction-strategies-pbl-andrew-miller
Scholastic *"4 Proven Strategies for Differentiating Instruction"*
https://beta.scholastic.com/teachers/articles/teaching-content/4-proven-strategies-differentiating-instruction/

Resources

Florida Center for Reading Research Center Activities
http://www.fcrr.org/curriculum/SCAindex.shtm
"Collection of Ready-to-use Literacy Center Ideas for Grades 3-5"
http://www.franklinboe.org/cms/lib/NJ01000817/Centricity/Domain/39/A_collection_of_ready_to_use_Literacy_Centers_Grades_3-5.pdf
Cooperative Learning Activities and Strategies
http://www.colorincolorado.org/article/cooperative-learning-strategies

MISSISSIPPI DEPARTMENT OF EDUCATION
Ensuring a bright future for every child

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Analyzing Common Assessment Data

Using the Objective report….

1. Put a Star beside the standards that have been taught this 9 weeks.
2. Out of the standards taught, highlight 60% and above green and anything below pink.
3. What are the 2 weakest standards that you highlighted pink?

Standard 1

_____

Standard 2

_____

Using a hard copy of the Common Assessment….

1. Locate the questions that assessed the weakest standard on the Common Assessment.
2. Complete the section below about each question.

Question #_____ Standard_____	Question #_____ Standard_____	Question #_____ Standard_____	Question #_____ Standard_____
1. What is the question asking the students to do? (verb)_____ _____ _____ _____ _____ _____	1. What is the question asking the students to do? (verb)_____ _____ _____ _____ _____ _____	1. What is the question asking the students to do? (verb)_____ _____ _____ _____ _____ _____	1. What is the question asking the students to do? (verb)_____ _____ _____ _____ _____ _____
2.What format is used to assess the standard? • MC • Part A and B • Fill in the Blank • Graphic Organizer • Select more than one answer • Drag and Drop	2. What format is used to assess the standard? • MC • Part A and B • Fill in the Blank • Graphic Organizer • Select more than one answer • Drag and Drop	2. What format is used to assess the standard? • MC • Part A and B • Fill in the Blank • Graphic Organizer • Select more than one answer • Drag and Drop	2. What format is used to assess the standard? • MC • Part A and B • Fill in the Blank • Graphic Organizer • Select more than one answer • Drag and Drop

Using the Scaffolding Document….

1. Locate the 2 weakest standards from Common Assessment that you chose above.

2. Identify the gaps…..Look at the evidence column on the SD for that standard. Which piece of evidence did the students not master?
   Standard _____
   _____
   Standard_____
   _____

3. Next steps/Strategies- What are our next steps to ensure these standards are mastered and the gaps are closed?

_____
_____
_____
_____
_____

Analyzing Individual Student Common Assessment Data

* Use the Objective Level Report and write in the standards assessed on the Common Assessment.

1. List your students' names for your homeroom.
2. Look at their objective report and write the percentage for each standard
3. For each standard, highlight 60% and above green and below 60% pink.

Student Names/Overall Total						Language Total									Lit Total										Info Total

Use for Small Group Purposes

Students below 60% Standard_____ _	Students below 60% Standard_____ _	Students below 60% Standard_____ _	Students below 60% Standard_____ _	Students below 60% Standard_____ _	Students below 60% Standard_____ _	Students below 60% Standard_____ _	Students below 60% Standard_____ _	Students below 60% Standard_____ _
Students below 60% Standard_____ _	Students below 60% Standard_____ _	Students below 60% Standard_____ _	Students below 60% Standard_____ _	Students below 60% Standard_____ _	Students below 60% Standard_____ _	Students below 60% Standard_____ _	Students below 60% Standard_____ _	Students below 60% Standard_____ _

Students below 60% Standard_____ _	Students below 60% Standard_____ _	Students below 60% Standard_____ _	Students below 60% Standard_____ _	Students below 60% Standard_____ _	Students below 60% Standard_____ _	Students below 60% Standard_____ _	Students below 60% Standard_____ _	Students below 60% Standard_____ _
Students below 60% Standard_____ _	Students below 60% Standard_____ _	Students below 60% Standard_____ _	Students below 60% Standard_____ _	Students below 60% Standard_____ _	Students below 60% Standard_____ _	Students below 60% Standard_____ _	Students below 60% Standard_____ _	Students below 60% Standard_____ _