Welcome to the 7th Grade Math
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> **The Year of Implementation and Alignment with the Common Core Objectives**

> *Learning Focus / Student-Centered – Teaching Techniques;*
> - ■ *Direct Lessons and Instructions*
> - ■ *"See the Big Picture"*
> - ■ *Treat each and every student as a thinker…. "What do you think?"*
> - ■ *Group, In-Class Work, Practices and Discussions*
> - ■ *One-on-One Guidance*
> - ■ *Peer-teaching*
> - ■ *Assessments as to reinforce learning and*
>   *Review of teaching effectiveness and Adjust.*

Textbook: California Middle School Mathematics Concepts and Skills – Course 2
          McDougal Littell (2006)

Course Description: 7th Grade Math is a collection of Mathematical skills in the areas of Sense of Numbers, basic fundamentals of Algebra, Measurement / Geometry, Statistic, and Mathematical Reasoning. These skill sets are important key steps toward deep understanding and application of Algebra (Algebra I and II) and Geometry.
These mentioned skill sets are covered over the span of two years. (6th and 7th Grade).

Goals: From the 7th grade Mathematics Curriculum - "By the end of grade seven, students are adept at manipulating numbers and equations and understand the general principles at work. Students understand and use factoring of numerators and denominators and properties of exponents. They know the Pythagorean theorem and solve problems in which they compute the length of an unknown side. Students know how to compute the surface area and volume of basic three-dimensional objects and understand how area and volume change with a change in scale. Students make conversions between different units of measurement. They know and use different representations of fractional numbers (fractions, decimals, and percents) and are proficient at changing from one to another. They increase their fluency with ratio and proportion, compute percents of increase and decrease, and compute simple and compound interest. They graph linear functions and understand the idea of slope and its relation to ratio."
Utilizing the textbook and other resources, we will work to fully teach all of the 7th grade standards. California Common Core Standards for the 7th grade math are listed in the last section of this document.

California Content Standards- 7th Grade Math
(NS 1.1-1.7, 2.1-2.5) **Number Sense**: Students will know the properties of rational numbers and can compare ad analyze them and can perform basic operations using the numbers.
(AF 1.1-1.5, 2.1-2.2, 3.1-3.4, 4.1-4.2) Algebra and Functions: Students translate verbal expressions into algebraic expressions, and equations, and they evaluate simple linear equations, and interpret the result in words. Students use tables and graphs and analyze problems involving rates and proportions. Students describe and evaluate geometric patters algebraically. Students graph simple linear equations and analyze.

(MG 1.1-1.3, 2.1-2.4, 3.1-3.6) Measurement and Geometry: Students gain understanding of plane and solids shapes and, in particular, students evaluate properties of two-dimensional figures. Students will know the Pythagorean theorem.
(SDP 1.1, 1.2, 1.3) Statistics, Data Analysis, and Probability Students compute and analyze statistical measurements for a given data set. Students determine theoretical and experimental probabilities.
(MR 1.1-1.3, 2.1-2.8, 3.1-3.3) Mathematical Reasoning: Students use prior knowledge to approach problem solving.

Differentiated Learning Environment and Instructions, Two Smaller Classes Setting:
Mr. Boegel and Mr. Motamed assisted by Mrs. Yip will be teaching the two 7th grade math classes, in two smaller subclasses within the Differentiated Learning framework. The two classes are essentially divided equally. Utilizing Differentiated Learning, we continuously try to teach to the individual student and capitalize on student's strengths. We modulate the depth of each section according to the individual abilities. We use various forms of assessments to adjust and refine instructions.

Differentiated Learning Environment Concept Diagram
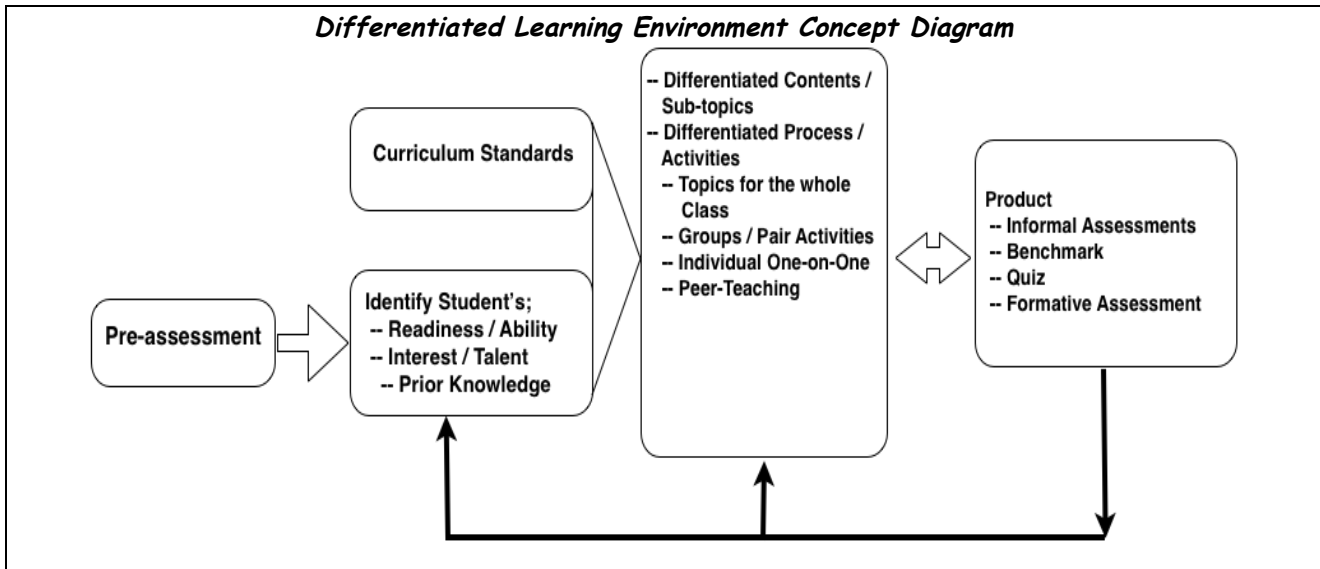
Grading Scale 2013 - 2014
- **Tests**……………………………………………………… 35%
- **Quizzes**………………………………………………… 30%
- **Group Tests / Math Facts Assessment**………… 5%
- **Homework / In-Class Work**……………………… 15%
- **Project** …………………………………………………… 10%
- **Participation / Conduct and Citizenship** ….. 3%
- **Folders and Notebook** ………………………………… 2%

Late Policy:
Assignments are due on the specified due dates. We consciously give adequate time for the assignments including time to start the work in the classes.
Therefore, for each late day, we will deduct 10% off the graded percent of an assignment. Late assignments after 5 school days (1 week) will receive *ZERO* point for that assignment. No work will be accepted more than one week (5 school days) after the required due date.
Missing assignments can seriously affect the final grade and continuous missing work is considered an act of disobedient and will result in more severe consequences.

Attendance / Absence / Make-up Work Policy:
- If you miss a class, you are responsible for getting the notes, class work, and homework from your classmates or from the website. (will be available shortly)

- If you are absent for a test, you must make arrangements with us to reschedule the test as soon as you return to the school. Rescheduling is your own responsibility.
- Being tardy is extremely disturbing to the class. You will loose part of your daily participation points for each tardy.
- Your attendance for the full length of all class periods is vital.

Daily Homework:
- Homework will be given daily (except Friday) and checked on the next day, unless otherwise specified.
- Homework serves as a review and practice of the day's lesson. On average you should expect to spend 45 to 60 minutes on homework.
- Homework must have the correct heading: ***Your full name, Homework Number, Date, Period***

Participation / Note Taking / Note Keeping / Organization / Conduct / Citizenship:
- Each student will automatically receive 3 points for this category daily. Every time you are late to class, misbehave, fail to follow directions, or are not on task, one point will be deducted from your daily participation grade.

Quizzes / Tests / Group Tests
- Quizzes / tests will be given almost once a week.
- No calculators are allowed on the tests or quizzes unless specified by us.
- Some tests will be completed in groups and others will be individually.
- Group tests generally will be prior to the chapter or unit test.
- Chapter tests will be given at the end of each chapter.
- We will provide guidance and practice worksheets prior to the chapter / unit test.

Classroom Rules:
- School policies on behavior fully apply in this class.

7ᵗʰ Grade Math: 2013 - 2014 Yearly Focus Overview

1ˢᵗ Quarter
- ❖ PEARL Connection and Reflection
- ❖ Review – Math Facts / Order of Operations
- ❖ Property of Real Numbers and the Application
- ❖ Solving Linear Equations (multi-step equations)
- ❖ Word Problem Solving / Set up / Solve / Analysis
- ❖ PEARL Review and Reflection

2ⁿᵈ Quarter
- ❖ PEARL Write Up
- ❖ Real World Problems – word problem solving
  - ➢ Strategies and Set Ups
  - ➢ Translation from English phrases to Mathematical Expression
  - ➢ Solving and Analyzing
- ❖ X-Y Coordinate – Graph and Analysis
  - ➢ Tables and Charts and Interpretation
  - ➢ Project: Use Excel to produce charts
- ❖ PEARL Reflection
- ❖ Rational Numbers and Percents
  - ➢ Math Facts Review of Fractions
  - ➢ Percent (Sales discounts, Tax, Mark up)

3ʳᵈ Quarter
- ❖ PEARL Connection and Reflection
- ❖ Math Facts Review (working with Fractions and Decimals)
- ❖ Real World Problems – word problems working with discounts, taxes, mark up
- ❖ Exponential Expressions; Exponent Rules
  - ➢ Multiplying and Dividing Exponents
  - ➢ Scientific Notations (and Engineering Notations)
- ❖ Proportional Reasoning
  - ➢ Rates, Ratios and Scale
  - ➢ More on Sales discounts, Tax, Mark up
  - ➢ Simple and Compound Interest
  - ➢ Project: Use Excel and Program to Calculate and Graph Compound Interest
- ❖ PEARL Write Up

4ᵗʰ Quarter
- ❖ PEARL Connection and Growth Project
- ❖ Geometry Connections and Linear Algebra
  - ➢ Lines, Linear Equations, Slope and Intercept Points, Parallel and Perpendicular Lines
- ❖ Geometry and Measurement
- ❖ Polynomials

Grade 7 Overview California Common Core Standards

Ratios and Proportional Relationships

- Analyze proportional relationships and use them to solve real-world and mathematical problems.

The Number System

- Apply and extend previous understandings of operations with fractions to add, subtract, multiply, and divide rational numbers.

Expressions and Equations

- Use properties of operations to generate equivalent expressions.
- Solve real-life and mathematical problems using numerical and algebraic expressions and equations.

Geometry

- Draw, construct and describe geometrical figures and describe the relationships between them.
- Solve real-life and mathematical problems involving angle measure, area, surface area, and volume.

Statistics and Probability

- Use random sampling to draw inferences about a population.
- Draw informal comparative inferences about two populations.
- Investigate chance processes and develop, use, and evaluate probability models.

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Ratios and Proportional Relationships 7.RP

Analyze proportional relationships and use them to solve real-world and mathematical problems.

1. Compute unit rates associated with ratios of fractions, including ratios of lengths, areas and other quantities measured in like or different units. *For example, if a person walks 1/2 mile in each 1/4 hour, compute the unit rate as the complex fraction $^{1/2}/_{1/4}$ miles per hour, equivalently 2 miles per hour.*

2. Recognize and represent proportional relationships between quantities.
   a. Decide whether two quantities are in a proportional relationship, e.g., by testing for equivalent ratios in a table or graphing on a coordinate plane and observing whether the graph is a straight line through the origin.
   b. Identify the constant of proportionality (unit rate) in tables, graphs, equations, diagrams, and verbal descriptions of proportional relationships.
   c. Represent proportional relationships by equations. *For example, if total cost t is proportional to the number n of items purchased at a constant price p, the relationship between the total cost and the number of items can be expressed as t = pn.*
   d. Explain what a point *(x, y)* on the graph of a proportional relationship means in terms of the situation, with special attention to the points (0, 0) and (1, *r*) where *r* is the unit rate.

3. Use proportional relationships to solve multistep ratio and percent problems. *Examples: simple interest, tax, markups and markdowns, gratuities and commissions, fees, percent increase and decrease, percent error.*

The Number System 7.NS

Apply and extend previous understandings of operations with fractions to add, subtract, multiply, and divide rational numbers.

1. Apply and extend previous understandings of addition and subtraction to add and subtract rational numbers; represent addition and subtraction on a horizontal or vertical number line diagram.
   a. Describe situations in which opposite quantities combine to make 0. *For example, a hydrogen atom has 0 charge because its two constituents are oppositely charged.*
   b. Understand $p + q$ as the number located a distance $|q|$ from p, in the positive or negative direction depending on whether q is positive or negative. Show that a number and its opposite have a sum of 0 (are additive inverses). Interpret sums of rational numbers by describing real-world contexts.
   c. Understand subtraction of rational numbers as adding the additive inverse, $p - q = p + (-q)$. Show that the distance between two rational numbers on the number line is the absolute value of their difference, and apply this principle in real-world contexts.
   d. Apply properties of operations as strategies to add and subtract rational numbers.

2. Apply and extend previous understandings of multiplication and division and of fractions to multiply and divide rational numbers.
   a. Understand that multiplication is extended from fractions to rational numbers by requiring that operations continue to satisfy the properties of operations, particularly the distributive property, leading to products such as $(-1)(-1) = 1$ and the rules for multiplying signed numbers. Interpret products of rational numbers by describing real-world contexts.
   b. Understand that integers can be divided, provided that the divisor is not zero, and every quotient of integers (with non-zero divisor) is a rational number. If p and q are integers, then $-(p/q) = (-p)/q = p/(-q)$. Interpret quotients of rational numbers by describing real world contexts.

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   c. Apply properties of operations as strategies to multiply and divide rational numbers.
   d. Convert a rational number to a decimal using long division; know that the decimal form of a rational number terminates in 0s or eventually repeats.
3. Solve real-world and mathematical problems involving the four operations with rational numbers.[1]

Expressions and Equations 7.EE

Use properties of operations to generate equivalent expressions.
1. Apply properties of operations as strategies to add, subtract, factor, and expand linear expressions with rational coefficients.
2. Understand that rewriting an expression in different forms in a problem context can shed light on the problem and how the quantities in it are related. *For example, a + 0.05a = 1.05a means that "increase by 5%" is the same as "multiply by 1.05."*

Solve real-life and mathematical problems using numerical and algebraic expressions and equations.
3. Solve multi-step real-life and mathematical problems posed with positive and negative rational numbers in any form (whole numbers, fractions, and decimals), using tools strategically. Apply properties of operations to calculate with numbers in any form; convert between forms as appropriate; and assess the reasonableness of answers using mental computation and estimation strategies. *For example: If a woman making $25 an hour gets a 10% raise, she will make an additional 1/10 of her salary an hour, or $2.50, for a new salary of $27.50. If you want to place a towel bar 9 3/4 inches long in the center of a door that is 27 1/2 inches wide, you will need to place the bar about 9 inches from each edge; this estimate can be used as a check on the exact computation.*
4. Use variables to represent quantities in a real-world or mathematical problem, and construct simple equations and inequalities to solve problems by reasoning about the quantities.
   a. Solve word problems leading to equations of the form $px + q = r$ and $p(x + q) = r$, where p, q, and r are specific rational numbers. Solve equations of these forms fluently. Compare an algebraic solution to an arithmetic solution, identifying the sequence of the operations used in each approach. *For example, the perimeter of a rectangle is 54 cm. Its length is 6 cm. What is its width?*
   b. Solve word problems leading to inequalities of the form $px + q > r$ or $px + q < r$, where p, q, and r are specific rational numbers. Graph the solution set of the inequality and interpret it in the context of the problem. *For example: As a salesperson, you are paid $50 per week plus $3 per sale. This week you want your pay to be at least $100. Write an inequality for the number of sales you need to make, and describe the solutions.*

Geometry 7.G

Draw, construct, and describe geometrical figures and describe the relationships between them.
1. Solve problems involving scale drawings of geometric figures, including computing actual lengths and areas from a scale drawing and reproducing a scale drawing at a different scale.
2. Draw (freehand, with ruler and protractor, and with technology) geometric shapes with given conditions. Focus on constructing triangles from three measures of angles or sides, noticing when the conditions determine a unique triangle, more than one triangle, or no triangle.
3. Describe the two-dimensional figures that result from slicing three-dimensional figures, as in plane sections of right rectangular prisms and right rectangular pyramids.

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[1] Computations with rational numbers extend the rules for manipulating fractions to complex fractions.

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Solve real-life and mathematical problems involving angle measure, area, surface area, and volume.

4. Know the formulas for the area and circumference of a circle and use them to solve problems; give an informal derivation of the relationship between the circumference and area of a circle.
5. Use facts about supplementary, complementary, vertical, and adjacent angles in a multi-step problem to write and solve simple equations for an unknown angle in a figure.
6. Solve real-world and mathematical problems involving area, volume and surface area of two- and three-dimensional objects composed of triangles, quadrilaterals, polygons, cubes, and right prisms.

Statistics and Probability 7.SP

Use random sampling to draw inferences about a population.

1. Understand that statistics can be used to gain information about a population by examining a sample of the population; generalizations about a population from a sample are valid only if the sample is representative of that population. Understand that random sampling tends to produce representative samples and support valid inferences.
2. Use data from a random sample to draw inferences about a population with an unknown characteristic of interest. Generate multiple samples (or simulated samples) of the same size to gauge the variation in estimates or predictions. *For example, estimate the mean word length in a book by randomly sampling words from the book; predict the winner of a school election based on randomly sampled survey data. Gauge how far off the estimate or prediction might be.*

Draw informal comparative inferences about two populations.

3. Informally assess the degree of visual overlap of two numerical data distributions with similar variabilities, measuring the difference between the centers by expressing it as a multiple of a measure of variability. *For example, the mean height of players on the basketball team is 10 cm greater than the mean height of players on the soccer team, about twice the variability (mean absolute deviation) on either team; on a dot plot, the separation between the two distributions of heights is noticeable.*
4. Use measures of center and measures of variability for numerical data from random samples to draw informal comparative inferences about two populations. *For example, decide whether the words in a chapter of a seventh-grade science book are generally longer than the words in a chapter of a fourth-grade science book.*

Investigate chance processes and develop, use, and evaluate probability models.

5. Understand that the probability of a chance event is a number between 0 and 1 that expresses the likelihood of the event occurring. Larger numbers indicate greater likelihood. A probability near 0 indicates an unlikely event, a probability around 1/2 indicates an event that is neither unlikely nor likely, and a probability near 1 indicates a likely event.
6. Approximate the probability of a chance event by collecting data on the chance process that produces it and observing its long-run relative frequency, and predict the approximate relative frequency given the probability. *For example, when rolling a number cube 600 times, predict that a 3 or 6 would be rolled roughly 200 times, but probably not exactly 200 times.*
7. Develop a probability model and use it to find probabilities of events. Compare probabilities from a model to observed frequencies; if the agreement is not good, explain possible sources of the discrepancy.

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    a. Develop a uniform probability model by assigning equal probability to all outcomes, and use the model to determine probabilities of events. *For example, if a student is selected at random from a class, find the probability that Jane will be selected and the probability that a girl will be selected.*

    b. Develop a probability model (which may not be uniform) by observing frequencies in data generated from a chance process. *For example, find the approximate probability that a spinning penny will land heads up or that a tossed paper cup will land open-end down. Do the outcomes for the spinning penny appear to be equally likely based on the observed frequencies?*

8. Find probabilities of compound events using organized lists, tables, tree diagrams, and simulation.

    a. Understand that, just as with simple events, the probability of a compound event is the fraction of outcomes in the sample space for which the compound event occurs.

    b. Represent sample spaces for compound events using methods such as organized lists, tables and tree diagrams. For an event described in everyday language (e.g., "rolling double sixes"), identify the outcomes in the sample space which compose the event.

    c. Design and use a simulation to generate frequencies for compound events. *For example, use random digits as a simulation tool to approximate the answer to the question: If 40% of donors have type A blood, what is the probability that it will take at least 4 donors to find one with type A blood?*