

Timothy Edwards Middle School

MATH INTERVENTION HANDBOOK



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Overview of Math Intervention

What is Math Intervention?

Math Intervention is a class that focuses on helping students strengthen their foundational math skills. The goal is to move students from their current level of performance toward grade-level expectations. Areas of weakness are identified through scaffolded skill cycles and targeted instruction is developed to meet the individual needs of each student. Smaller class size allows for an individualized approach to instruction through mini-lessons and hands-on activities designed for various learning styles. As a student progresses through each skill cycle, the discrepancy narrows between his/her ability and grade-level expectations. As these gaps narrow, time in intervention is also used to support on-grade level skills introduced in the team math class.

How does my child become enrolled in Math Intervention?

When does my child attend Math Intervention?

Math Intervention is attended during one of the encore periods. The frequency a student attends Math Intervention is dependent upon his/her individual needs. Math Intervention does not replace team math classes.

How is my child's progress monitored in Math Intervention?

Student progress is monitored through short assessments called probes. Intervention classrooms are structured to move students through a series of math cycles (each cycle focusing on a different skillset). Every cycle begins with a pre-assessment to identify target areas of instruction for your child. Small group or individual mini-lessons are presented and practice occurs with immediate feedback. When ready, students are given a post-assessment to check for understanding and growth in each cycle.

When is my child dismissed from Math Intervention?

A student will be exited from Math Intervention upon the recommendation of the intervention teacher supported by documentation of data. Documentation of data will include at least three of the four listed below:

- Completion of TEMS Math Intervention Cycles to grade level.
- TEMS Math Intervention Cycle Reviews reflecting retention of skills.
- TEMS Math Intervention Screen average at or above 75%.
- SMI score at or above "approaching grade level" band.

Math Intervention Cycles

Math Intervention is structured to move students through a series of math cycles focusing on different skillsets. Every cycle begins with a pre-assessment to identify target areas for instruction. Small group or individual mini-lessons are presented and practice occurs with immediate feedback. When ready, students complete a post-assessment to show their understanding and growth within a specific cycle. The following is a brief overview of the skills found in each cycle.

Cycle A: Whole Number Place Value

- Convert from expanded notation to standard notation
 - (i.e. $4 \times 1,000 + 2 \times 100 + 7 \times 10 + 3 \times 1 = 4,273$)
- Write a number from words up to the millions place
 - (i.e. Two hundred sixty-seven thousand = 267,000)
- Identify the place value for a given digit
- Determine the value of a specific digit in a number
 - (i.e. The 8 in 847 is worth 800)
- Compare and order whole numbers
- Round whole numbers to a given place

Cycle B: Mental Math

- Multiply whole numbers by powers of ten (including multiples of ten by multiples of ten)
 - (i.e. $42 \times 100 = 4,200$)
 - (i.e. $20 \times 30 = 600$)
- Divide whole numbers by powers of ten
 - (i.e. $6,200 \div 10 = 620$)
- Determine the unknown number that makes an equation true (addition and multiplication)
 - (i.e. $3 + 8 = \underline{\quad} + 6$)
 - (i.e. $4 \times \underline{\quad} = 8 \times 3$)
- Use computation strategies effectively
 - Make ten (i.e. $4 + \underline{\quad} = 10$)
 - One more/one less (i.e. $14 + 9 = 14 + 10 - 1$)
 - Doubles (i.e. $8 + 8 = 16$)
 - Almost doubles (i.e. $7 + 8 = 8 + 8 - 1$)
 - Add and subtract multiples of ten (i.e. 20 more than 47 is 67)

Cycle C: Whole Number Operations

- Add multi-digit whole numbers
- Subtract multi-digit whole numbers
- Multiply multi-digit whole numbers
- Divide multi-digit whole numbers by a single-digit divisor (with/without remainders)
- Estimate an answer
- Solve one and two-step story problems using all operations

Cycle D: Decimal Place Value

- Convert from expanded notation to standard notation
 - (i.e. $4 \times 100 + 8 \times 10 + 7 \times 1 + 3 \times \frac{1}{10} + 5 \times \frac{1}{100} = 487.35$)
- Write a number from words to the ten thousandths place
 - (i.e. Three thousand and seven tenths = 3,000.7)
- Identify the place value for a given digit in a decimal
- Determine the value of a specific digit in a decimal
 - (i.e. The 7 in 6.278 is worth $\frac{7}{100}$)
- Compare and order decimals
- Round decimals to a given place

Cycle E: Decimal Operations

- Add decimals (including adding a whole number and a decimal)
- Subtract decimals (including subtracting a whole number and a decimal)
- Multiply and divide decimals by powers of ten
 - (i.e. $23.74 \times 10 = 237.4$)
 - (i.e. $7.5 \div 1,000 = 0.0075$)
- Multiply decimals
- Divide a decimal by a decimal or a whole number
- Estimate an answer
- Solve one and two-step story problems using all operations

Cycle F: **Money and Time**

- Name coins and identify their value
- Make different combinations of dollars and coins to represent a given amount
- Solve one and two-step story problems involving money
- Convert units of time accurately
 - (i.e. 75 min. = 1 hr. 15 min.)
 - (i.e. 7 days = 1 week)
- Telling time on an analog clock (including familiar expressions, i.e. “half past”, “quarter of”)
- Solve story problems involving elapsed time

Cycle G: **Factors, Multiples, and Divisibility**

- Identify prime and composite numbers
- List the factors of a given number
 - (i.e. Factors of 12: 1, 2, 3, 4, 6, 12)
- Find the prime factorization of a number
 - (i.e. Prime factorization of 24: $2^3 \cdot 3$)
- List the multiples of a given number
 - (i.e. Multiples of 5: 5, 10, 15, 20, 25 ...)
- Find the LCM (least common multiple) and GCF (greatest common factor) of a pair of numbers
- Use divisibility rules to identify if a multi-digit number is divisible by 2, 3, 5, & 10.

Cycle H: **Understanding Fractions**

- Determine the fraction represented by a picture
- Name equivalent fractions for a given fraction
- Simplify Fractions
- Convert between decimals and fractions
- Compare Fractions
- Locate a given fraction using a number line
- Convert between improper fractions (fractions greater than one) and mixed numbers
 - (i.e. $\frac{4}{3} = 1\frac{1}{3}$)

Cycle I: **Fraction Operations**

- Add fractions with both like and unlike denominators
- Subtract fractions with both like and unlike denominators
- Multiply fractions
- Divide fractions
- Solve story problems using all operations

Cycle J: **Mixed Number Operations**

- Add mixed numbers with unlike denominators (including adding a whole number and a mixed number)
- Subtract mixed numbers with unlike denominators
- Subtract mixed numbers with regrouping
 - (i.e. $8\frac{1}{5} - 3\frac{4}{5} = 4\frac{2}{5}$)
- Multiply mixed numbers
- Divide mixed numbers
- Solve story problems using all operations

Cycle K: **Basic Geometry**

- Find the area of rectangles and triangles
- Find the perimeter of rectangles and triangles
- Find the area and perimeter of irregular figures
- Determine the measure of an unknown side of a rectangle or triangle given the area or perimeter

Cycle L: **Ratios and Rates**

- Write ratios to represent a given situation
- Calculate a unit rate
 - (i.e. \$32 for 4 hours of work = \$8 per hour)
- Apply the unit rate in different scenarios (i.e. “Which is the better buy?”)

Cycle M: Order of Operations

- Apply the *order of operation* to simplify expressions
 - PEMDAS (i.e. Parenthesis, Exponents, Multiply & Divide, Add & Subtract)

Cycle N: Introduction to Integers

- Compare and order integers
 - (i.e. $-8 < -2$)
 - (i.e. $-6, -2, 0, 2, 6$)
- Locate an integer on a number line
- Identify the opposite of an integer
 - (i.e. -7 and 7)
- Identify the absolute value
 - (i.e. $|-5| = 5$ and $|5| = 5$)

Cycle O: Integer Operations

- Add, subtract, multiply, and divide integers
- Apply the *order of operations* to simplify expressions containing integers

Cycle P: Writing and Evaluating Expressions

- Translate a given statement into a variable expression
 - (i.e. 5 less than a number $\rightarrow n - 5$)
- Evaluate expressions
 - (i.e. Evaluate $3(4 + x)$ when $x = 7$)
- Simplify variable expressions (including the use of the distributive property)
 - (i.e. $5(x - 2) = 5x - 10$)

Cycle Q: Introduction to Percentages

- Determine the percentage represented by a picture
- Draw a picture to represent a given percentage
- Convert between decimals, fractions, and percentages
 - (i.e. $0.8 = \frac{8}{10} = 80\%$)
- Find a percent of a given number
- Solve story problems involving percent

Cycle R: Proportions

- Solve for the unknown in a proportion
 - (i.e. $\frac{x}{5} = \frac{6}{15}$)
- Prove if two ratios are proportional
- Use proportions to solve story problems
- Find the constant of proportionality (rate of change) to write an equation that models the relationship between variables
- Use the constant of proportionality (rate of change) to find the missing value in a table

Cycle S: Simplifying Expressions and Solving Equations

- Solve one and two-step equations using inverse operations (may include the distributive property and simplifying like-terms)
- Write and solve an equation that models a given story problem

School to Home Link

It is extremely beneficial for students to extend their learning beyond the classroom. Outlined below, please find resources and information that can guide you in helping your child with math.

Fact Fluency

Fact fluency is the ability to recall answers to basic math facts with little to no hesitation. The ability to retrieve facts automatically allows students to move their focus from these calculations to learning new math concepts. Fact fluency is gained through significant practice. Students who do not have fact fluency (especially with multiplication facts) have a difficult time completing middle school math tasks efficiently and accurately. Please encourage your child to practice his/her math facts regularly with flash cards or online programs/apps (some suggestions are listed below). Intervention teachers can be contacted to provide you with specific math facts your child has yet to master.

Websites

- Mr. Nussbaum's Math: <http://www.mrnussbaum.com/mathcode.htm>
- Math Dictionary: <http://www.amathsdictionaryforkids.com/>
- Math Playground: <http://www.mathplayground.com/>
- Multiplication Practice: <http://www.multiplication.com/>
- Math-Play: <http://math-play.com/>
- XP Math: <http://www.xpmath.com/>
- Cool Math for Kids: <http://www.coolmath4kids.com/>
- Johnnie's Math Page: <http://jmathpage.com/>
- Khan Academy: <https://www.khanacademy.org/>
- IXL (see page 10 for further information): <https://www.ixl.com/signin/swindsor>

Apps for your Smart Phone and/or Tablet

- Math Bingo
- Math Hunt
- Khan Academy
- Kakooma
- Deep Sea Duel
- Chicken Coop Fractions
- Lobster Diver
- Middle School Math HD
- Sumdog
- Ratio Rumble

Find more suggestions for popular math apps at:

- Common Core Aligned Math Apps: <http://www.teachthought.com/apps-2/25-common-core-aligned-math-apps-for-middle-school-students-from-edshelf/>

IXL Skill Practice

<https://www.ixl.com/signin/swindsor>

Each student in TEMS has been provided with an account to IXL. This is where students can find math practice aligned to curricular standards. Student's individual progress on this site is monitored and tracked to provide data for both the teacher and student. When practicing, students receive immediate feedback on each question including an explanation for incorrect responses. Below you will find IXL skills matched to each math intervention cycle.

How to read IXL skill labels:	The first number represents the grade-level tab. The letter represents the topic within that grade. The second number is the specific skill within that topic.
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Cycle A: Whole Number Place Value

- Expanded Notation: 3.B.7 3.B.8
- Writing Numbers from Words: 5.A.4 6.A.2
- Rounding: 5.A.6
- Comparing Numbers: 5.A.3
- Identifying Place Value: 6.A.1

Cycle B: Mental Math

- Add Multiples of Ten: 2.G.1
- Subtract Multiples of Ten: 2.H.1
- Multiply by Ten: 3.F.11
- Multiply by a Multiple of Ten: 3.H.1
- Divide by Power of Ten: 5.J.1

Cycle C: Whole Number Operations

- Add: 4.B.1 4.B.2 (word problems)
- Subtract: 4.C.1 4.C.2 (word problems)
- Add & Subtract: 5.B.1 5.B.2 (word problems)
- Multiply: 4.D.7 4.D.18 4.D.22
- Divide: 4.E.4 4.E.8 5.D.3 5.D.4 (word problems)
- Mixed Operations: 4.F.1 5.O.1 5.O.2 (word problems)

Cycle D: Decimal Place Value

- Write Decimals from Words: 5.G.3 6.F.3
- Identify the Place Value of a Digit: 5.G.4 6.F.2
- Rounding: 5.G.7 6.F.7 7.D.4
- Compare and Order: 5.G.10 5.G.11 6.F.5 7.D.2
- Expanded Notation: 5.G.14

Cycle E: Decimal Operations

- Add & Subtract: 6.G.1 7.E.1
- Multiply: 6.H.2 7.E.3
- Divide by a Whole Number: 6.H.4 7.E.6 (word problems)
- Divide with Decimal Quotients: 6.H.7
- Mixed Operations: 6.O.4

Cycle F: Money and Time

- Coins and Values: 2.P.1 2.P.3 2.P.4
- Dollars & Coins to make an Amount: 2.P.5 4.M.1 6.U.1
- Word Problems with Money: 6.U.3 6.U.5 6.U.7
- Telling Time: 2.Q.6 3.T.3
- Time Equivalencies: 2.Q.17 3.T.9 4.O.1 5.Y.1
- Word Problems with Elapsed Time: 3.T.7 4.O.6 4.O.7 5.Y.5

Cycle G: Factors, Multiples, & Divisibility

- Prime and Composite Numbers: 5.F.1 6.E.3 7.A.1
- Identify Factors: 6.E.4 8.A.1
- Prime Factorization: 6.E.6 7.A.2 8.A.4
- LCM: 6.E.8 7.A.6 8.A.6
- GCF: 5.F.6 6.E.7 7.A.5 8.A.5
- LCM and GCF Word Problems: 6.E.9 7.A.7 8.A.7
- Divisibility: 3.L.11 5.F.4 6.C.1

Cycle H: Introduction to Fractions

- Simplify: 5.K.4 6.I.3 7.F.2
- Compare and Order: 5.K.10 6.I.6 7.F.5
- Convert between Mixed & Improper: 5.K.5 6.I.8 7.F.7
- Equivalent: 6.I.2 7.F.1
- Convert to Decimals: 5.G.12 5.G.13 6.I.9

Cycle I: Fraction Operations

- Add & Subtract with Like Denominators: 6.J.1 6.J.2 (word problems)
- Least Common Denominator: 7.F.4
- Add and Subtract with Unlike Denominators: 6.J.3 6.J.4 (word problems)
- Add & Subtract with Like/Unlike Denominators: 7.G.1 7.G.2 (word problems)
- Multiply: 6.K.6 7.G.9 6.K.7 (word problems)
- Divide: 6.L.5 7.G.12
- Mixed Operations with Fractions: 6.O.7 6.O.8 (word problems)

Cycle J: Mixed Number Operations

- Add and Subtract: 6.J.6 7.G.3 7.G.4 (word problems)
- Multiply Mixed Number and Whole Number: 6.K.10 7.G.7
- Multiply Mixed Numbers: 6.K.11 7.G.10 7.G.11 (word problems)
- Divide Fractions and Mixed Numbers: 6.L.7 7.G.13 7.G.14 (word problems)
- Mixed Operations Word Problems: 7.G.16

Cycle K: Basic Geometry

- Perimeter: 5.EE.1 6.FF.1 7.AA.1
- Area of Squares and Rectangles: 5.EE.2
- Area of Irregular Figures: 5.EE.5 6.FF.6
- Area of Triangles: 5.EE.3 6.FF.3

Cycle L: Ratios & Rates

- Unit Rates: 6.R.7 7.J.5
- Unit Rates (word problems): 6.R.9 7.J.6

Cycle M: Order of Operations

- Simplifying Expressions: 4.F.10 5.O.4

Cycle N: Introduction to Integers

- Compare and Order Integers: 6.M.5 7.B.5 8.B.4
- Locate an Integer on a Number Line: 6.M.3 6.M.4 7.B.2 7.B.3
- Opposites and Absolute Value: 6.M.2 7.B.4 8.B.3

Cycle O: Integer Operations

- Add and Subtract with Counters: 6.N.1 6.N.3
- Add: 6.N.2
- Subtract: 6.N.4
- Add and Subtract: 7.C.3 8.C.3
- Multiply and Divide: 7.C.7 8.C.7
- Order of Operations with Integers: Algebra.B.2

Cycle P: Writing and Evaluating Expressions:

- Simplify Variable Expressions: 6.Y.12 6.Y.13 7.R.12
- Write Variable Expressions: 7.R.1 8.V.1
- Evaluate Multi-Variable Expressions: 7.R.4 8.V.5

Cycle Q: Introduction to Percentages

- Convert between Percent, Fraction, and Decimal: 6.S.1 7.L.2
- Find the Percent of a Number: 6.S.4 7.L.5
- Percent of Numbers (word problems): 6.S.5 7.L.6
- Find what Percent a Number is of Another (word problems): 6.S.8 7.L.8

Cycle R: Proportions

- Solve for the Variable: 7.J.10
- Are the Ratios Proportional?: 7.J.8
- Write an Equation for a Proportional Relationship: 8.I.4
- Ratio Tables: 6.R.5

Cycle S: Simplify Expressions and Solve Equations

- One-Step Equations w/Whole Numbers: 6.Y.3
- Solve Equations with Algebra Tiles: 7.S.3
- One-Step Linear Equations: 7.S.5
- One-Step Equations w/Decimals, Fractions and Mixed Numbers: 6.Y.5
- Two-Step Linear Equations: 6.Z.9 7.S.6 Algebra.J.4
- Solve Multi-Step Equations: 8.W.8
- Solve Equations w/Like-Terms: 8.W.9



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