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Resources for Summer Mathematics Preparation

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Dear Parents/Guardians,

As summer sets in, you may be thinking about how to preserve your child's Mathematics skills over the summer break. In an effort to assist parents in helping their children retain and strengthen their mathematics skills, we have generated a list of topics for the first three units, on each grade level, for the upcoming school year, as well as a list of online websites/resources that the students can engage with. Children typically forget some of what they learned during the school year if they do not engage in learning activities over the summer. We encourage students to engage in 20-30 minutes of mathematics skill based activities a few days a week, to keep sharp for the upcoming school year. In addition, we have included a list of fundamental skills/prerequisite topics from the previous grade level that students should have before entering the next grade level. Attached to this letter please find the topics and list of websites/resources that can be used to help make summer work interactive and exciting while still focusing on reviewing specific concepts.

I wish you and your children a safe, restful and enjoyable summer!

Sincerely,

Antonella Schiano
Assistant Principal, Math Department
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Preparing for 6th Grade Mathematics

Prerequisite 5th Grade Mathematics Skills

- Multiplication Facts
- Long Division
- Fraction Addition, Subtraction and Multiplication
- Decimal Addition, Subtraction and Multiplication

Beginning of Year 6th Grade Mathematics Topics

Decimal and Fraction Operations (Standards: 6NS1, 6NS2, 6NS3)

- All operations with decimals
- All operations with fractions

In 6th Grade more emphasis will be placed on the **division of Fractions and Decimals

** Students will work on multi-step word problems

Ratios, Proportions and Percent (Standards: 6RP1, 6RP2, 6RP3)

- Writing and Simplifying Ratios
- Creating Equivalent Ratios
- Recognizing Proportional Relationships
- Graphing Proportional Relationships
- Converting Measurements with Proportions
- Solving Problems with Percent

Rational Numbers (Standards: 6NS5, 6NS6, 6NS7, 6NS8)

- Converting between Fractions and Decimals
- Locating Rational Numbers on the Number Line
- Ordering Rational Numbers
- Absolute Value
- Graphing on the Coordinate Plane
- Integer (Positive and Negative) Operations

Online Resources:

<https://www.khanacademy.org/math/cc-sixth-grade-math>

With this site, you can create a free account to monitor your progress. There are instructional videos, guided examples as well as independent practice to complete.

<https://www.ixl.com/math/grade-6>

This site offers practice problems on each topic. You can practice for free with a set number of practice problems allowed each day or you can sign up for a paid account to access additional practice

<http://mathbitsnotebook.com/JuniorMath/JRMath.html>

This site has lessons and examples outlined as well as interactive practice problems for each topic.

<https://mathantics.com/>

This site is filled with engaging math videos to explain various topics. Access to all videos is free and you can sign up for \$10 for the year to gain access to practice worksheets and additional resources.

<https://www.virtualnerd.com/middle-math/all/>

This site offers video tutorials on math topics and also has links to pre-requisite skills videos for each topic.

<https://www.mashupmath.com/math-videos-4th-5th-6th>

This site offers videos on math topics as well as practice worksheets for many topics.

Preparing for 7th Grade Mathematics

Prerequisite 6th Grade Mathematics Skills

- Ordering rational numbers
- Equivalent ratios
- Understanding percent
- Finding the greatest common factor
- Solving one-step equations
- Solving one-step inequalities

Beginning of Year 7th Grade Mathematics Topics

Problem Solving with Rational Numbers (7.NS.1,2,3; 7.EE.3)

- Operations with fractions and decimals
- Operations with integers
- Converting between fractions, decimals, and percent

Proportions and Percent (7.RP.1,2,3)

- Determining if quantities are proportional
- Solving proportions
- Finding unit rate and unit price
- Determining the better buy
- Solving problems using the percent proportion and the percent equation
- Finding tax and tip
- Finding discount and sale price
- Finding mark up
- Finding commission
- Finding simple interest
- Finding percent of change
- Finding percent error

Linear Equations and Inequalities in One Variable (7.EE.1,2,3,4)

- Adding and subtracting monomials and binomials
- Creating equivalent expressions by factoring out the greatest common factor
- Creating equivalent expressions using the distributive property
- Solving two-step equations
- Solving multi-step equations
- Solving multi-step equations with variables on both sides
- Identifying the number of solutions to an equation (one solution, no solution, infinitely many solutions)
- Solving and graphing two-step inequalities
- Solving negative inequalities

Online Resources

Below is a list of websites that can be great resources for extra practice, tutorials on a specific topic, examples, definitions, or enrichment for you and your child.

Extra Websites that have video tutorials and Practice:

- Math Antics
 - o www.mathantics.com
- MashUp Math
 - o www.mashupmath.com
- Khan Academy - Has great practice problems in addition to videos.
 - o <https://www.khanacademy.org/>
- The Art of Problem Solving
 - o <http://www.artofproblemsolving.com/videos>
- Patrick JMT
 - o <http://patrickjmt.com/>
- Virtual Nerd
 - o <http://www.virtualnerd.com/>
- Prodigy
 - o <https://sso.prodigygame.com/login?rid=a982dd97-e483-406d-a5ed-8c39b597373b#>

Extra Websites that discuss topics, vocabulary, and have practice problems:

- JMAP: Past Regents Questions
 - o <http://www.jmap.org/>
- Math is Fun
 - o <https://www.mathsisfun.com/>
- Math Bits
 - o <http://mathbits.com/>

Other:

- Wolfram Alpha – Calculates problems and defines math vocabulary
 - o <http://www.wolframalpha.com/>
- An amazing list of even more math websites and resources:
 - o <http://www.cumbavac.org/math.htm>

Preparing for 8th Grade General Education Mathematics

Prerequisite 7th Grade Mathematics Skills

- Integer Rules
- Solving one step and two step equations
- Graphing linear equations
- Knowledge of percent's, decimals, and fractions

Beginning of Year 8th Grade Mathematics Topics

Equations and Volume

- Solving equations using combining like terms and distributive property (8.EE.7b)
- Solving multi-Step equations (8.EE.7b)
- Solving equations with variables on both sides (8.EE.7b)
- Explore equations with special cases (number of solutions) (8.EE.7a)
- Determining the volume of a 3-D shape using the formula (cylinders, cones, and spheres) (8.G.9)
- Volume real world word problems (8.G.9)

Pythagorean Theorem

- Identifying square and cubed roots (8.EE.2)
- Proving the Pythagorean theorem (8.G.6)
- Applying the Pythagorean theorem (8.G.7)
- Determining the distance of the hypotenuse on the coordinate plane (8.G.8)
- Solving real world problems applying the Pythagorean theorem (8.G.6,7,8)

Angles

- Identifying and determining the measure of complementary and supplementary angles (8.G.5)
- Identifying and determining the measure of vertical angles (8.G.5)
- Identifying angle pairs formed when parallel lines are cut by a transversal (8.G.5)
- Determining missing angles inside of a triangle (8.G.5)
- Determining exterior angles of a triangle (8.G.5)

Online Resources

- Khan Academy <https://www.khanacademy.org/>
- Prodigy <https://sso.prodigygame.com/login?rid=a982dd97-e483-406d-a5ed-8c39b597373b#>
- Quizizz <https://quizizz.com/>
- IXL <https://ca.ixl.com/math/>
- Math Antics <https://mathantics.com/>
- Math is Fun <https://www.mathsisfun.com/>
- Math Bits <https://mathbits.com/>

Preparing for Algebra 1

Prerequisite 8th Grade Mathematics Skills

- Integer rules
- Graphing linear functions
- Solving equations
- Evaluating expressions
- Understanding percents, decimals, fractions and converting between
- Unit conversion
- Exponent rules

Beginning of Year Algebra 1 Topics

Solving Equations/Literal Equations

- Properties of Real Numbers (A.REI.A.2)
- Solving equations with rational numbers (A.REI.A.1)
- Solving multi-step equations including variables on both sides (A.REI.A.1, 2)
- Solving equations with squared variables using square roots (A.REI.A.1)
- Solve equations with special cases – more than one solution (A.REI.A.1, 2)
- Rewrite literal equations in terms of a different variable (A.CED.A.4, A.REI.B.3)
- Explore solutions to inequalities (A.CED.A.1)
- Solve multi-step inequalities (A.CED.A.1)
- Graph multi-step inequalities on a number line (A.CED.A.1)

Linear Functions/Linear Inequalities

- Relate graphs to events – Motion Graphs (F.IF.B.4)
- Determine if a relation is a function (F.IF.A.1, F.IF.A.2)
- Evaluate a function using function notation (F.IF.B.5)
- Find the domain and range of a graphed function using interval notation
- Write equation of a line in slope-intercept form and identify the slope and y-intercept, (F.IF.C.7, A.CED.A.2)
- Graph linear equations in slope-intercept form (F.IF.C.7, A.CED.A.2)
- Identify the slope and y-intercept of linear functions given a graph, a table of values, or an equation (F.IF.C.7, A.CED.A.2)
- Change a linear function from standard form to slope-intercept form (F.IF.C.7, A.CED.A.2)
- Graph linear inequalities in the coordinate plane (A.REI.D.10, 12)
- Solve real-world linear inequalities and graph on coordinate plane, identify solutions (A.REI.D.10, 12)

Linear and Exponential Functions

- Rules of exponents (8.EE.1)
- Graph exponential functions from tables of values (F.IF.A.2, LE.A.1.C)
- Recognize exponential growth or decay (F.LE.A.1.C)
- Write and evaluate exponential functions given a situation using knowledge of percents, growth, and decay (F.LE.A.1.C, F.LE.A.2, A.CED.A.2)
- Find compound interest (F.LE.A.1.C, F.LE.A.2, A.CED.A.2)

- Identify when a situation should be represented by an exponential function or linear function (F.LE.A.1.C, F.LE.A.2, A.CED.A.2)
- Arithmetic recursive and explicit sequences (F.LE.A.2, F.IF.A.3)
- Geometric recursive and explicit sequences (F.LE.A.2, F.IF.A.3)

Online Resources

Below is a list of websites that can be great resources for extra practice, tutorials on a specific topic, examples, definitions, or enrichment for you and your child.

Algebra 1 Study Guide: (See Additional Attachment)

Websites that have video tutorials:

- Khan Academy - Has great practice problems in addition to videos.
 - <https://www.khanacademy.org/>
- The Art of Problem Solving
 - <http://www.artofproblemsolving.com/videos>
- Patrick JMT
 - <http://patrickjmt.com/>
- Virtual Nerd
 - <http://www.virtualnerd.com/>
- eMATHinstructon
 - <https://www.emathinstruction.com/courses/common-core-algebra-i/>

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- Math Bits
 - <http://mathbits.com/>
- Delta Math
 - <https://deltamath.com>

Other:

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