



# RTTT Facts for Families

RACE TO THE TOP

January-February 2012

## Facts for Families

is a regional publication to help the parents in our region better understand how the federal Race To The Top (RTTT) initiative will impact their child(ren).



In this issue, you'll gain understanding and learn tips that you can implement at home.

## Table of Contents

ELA Overview . . .	1
ELA K-1 . . . . .	1
ELA 2-5 . . . . .	2
ELA 6-8 . . . . .	3
ELA 9-11 . . . . .	4
Math K-1 . . . . .	5
Math 2-3 . . . . .	6
Math 4-5 . . . . .	7
Math 6-7 . . . . .	8
Math 8 . . . . .	9
Math H.S. . . . .	10-12



# English Language Arts K-5

If your child is in grades K-5, they will be reading:

- **Stories** - Includes adventures, folktales, legends, fables, fantasy, realistic fiction, and myths
- **Dramas** - Includes written dialogue and brief familiar scenes
- **Poetry** - Includes nursery rhymes, narrative poems, limericks, and free verse poems
- **Nonfiction and Historical, Scientific, and Technical Texts** - Includes biographies and autobiographies; books about history, social studies, science and the arts; technical texts including directions, forms and information displayed in graphs, charts or maps; and digital sources on a range of topics



## Kindergarten

A key focus in kindergarten is the development of language skills. Learning about the alphabet will lay the groundwork for reading. Students will also learn about the different patterns within the English language, such as words that begin with the same sounds and words that rhyme. These activities will lead to the blending of the different sounds that letters make into words. Building your child's vocabulary is another foundational skill that will support his or her ability to read and comprehend. In kindergarten, experimentation with writing is encouraged. Children will be asked to draw, write letters and verbalize their thoughts, feelings and ideas.

## 1st Grade

As your child goes through first grade, he or she will continue to distinguish sounds that make up words and begin to read and write more independently. The distinction of different sounds will allow for reading more complex words by

### Reading suggestions: Grade Level: Kindergarten

#### Literature: Stories, Drama, Poetry

- ❖ Over in the Meadow by John Langstaff (traditional)
- ❖ A Boy, a Dog, and a Frog by Mercer Mayer
- ❖ A Story, A Story by Gail E. Haley
- ❖ Pancakes for Breakfast by Tomie DePaola
- ❖ Kitten's First Full Moon by Kevin Henkes

#### Informational Texts: Literary Nonfiction and Historical, Scientific, and Technical Texts

- ❖ My Five Senses by Alikei
- ❖ Truck by Donald Crews
- ❖ I Read Signs by Tana Hoban
- ❖ What Do You Do With a Tail Like This? by Steve Jenkins and Robin Page
- ❖ Amazing Whales! by Sarah L. Thomson

### Reading suggestions: Grade Level 1

#### Literature: Stories, Drama, Poetry

- ❖ Mix a Pancake by Christina G. Rossetti
- ❖ Mr. Popper's Penguins by Richard Atwater
- ❖ Little Bear by Else Holmelund Minarik, illustrated by Maurice Sendak
- ❖ Frog and Toad Together by Arnold Lobel
- ❖ Hi! Fly Guy by Tedd Arnold

continued on next page

# English Language Arts K-5

## 1st Grade *continued from page 1*

sounding them out. Learning to describe the main ideas of simple stories that your child will read is one important component to developing proficiency and comprehension. First graders will also begin to use complete sentences as well as correct spelling within their writing.

## 2nd Grade

In second grade, students will continue to connect different sounds to letters in words as well as understand the meaning of a new word formed from words with the same root (e.g., gold and golden) or a known prefix (e.g., do/undo). Your child will also continue to acquire more skills in reading, writing, speaking and listening. He or she will be able to highlight key facts, write stories with a beginning, middle, and end, and spell most words correctly.

## 3rd Grade

Reading fluently, reading stories and poems without pausing to sound words out, is the critical goal for your child at the end of third grade. This will lay the groundwork for future reading tasks in later grades. Building your child's vocabulary will allow him or her to read more challenging texts and build knowledge about the world. Also, your child will be writing clear complete sentences as well as stories that establish a situation and follow through a logical progression of events.

## 4th Grade

Students in fourth grade will gain cultural awareness through reading books, stories and poems. Your child will be asked to write summaries or opinions about topics while comparing ideas, events, characters and settings from different texts. Students should be encouraged to describe what a book or article says by paying attention to the key features of the text and citing text-based evidence. Working with your child on building vocabulary will also help him or her to read more complex books and stories.

## 5th Grade

Your child will continue to gain knowledge about other cultures and historical events through research projects and analyzing nonfiction texts.



Improvement of grammar and writing skills will come through written essays and stories. Having your child edit his or her work will help to refine and improve writing samples. The level of reading material in fifth grade will become increasingly more complex and challenging in both fiction and nonfiction. Use of the computer for research and publication of written work will be integrated in your child's fifth grade classroom.

### *Reading suggestions: Grade Level 1*

#### **Informational Texts: Literary Nonfiction and Historical, Scientific, and Technical Texts**

- ❖ A Tree Is a Plant by Clyde Robert Bulla, illustrated by Stacey Schuett
- ❖ Starfish by Edith Thacher Hurd
- ❖ Follow the Water from Brook to Ocean by Arthur Dorros
- ❖ From Seed to Pumpkin by Wendy Pfeffer, illustrated by James Graham Hale
- ❖ How People Learned to Fly by Fran Hodgkins and True Kelley

### *Reading suggestions: Grade Levels 2-3*

#### **Literature: Stories, Drama, Poetry**

- ❖ "Who Has Seen the Wind?" by Christina G. Rossetti
- ❖ Charlotte's Web by E. B. White
- ❖ Sarah, Plain and Tall by Patricia MacLachlan
- ❖ Tops and Bottoms by Janet Stevens
- ❖ Poppleton in Winter by Cynthia Rylant, illustrated by Mark Teague

#### **Informational Texts: Literary Nonfiction and Historical, Scientific, and Technical Texts**

- ❖ A Medieval Feast by Alikei
- ❖ From Seed to Plant by Gail Gibbons
- ❖ The Story of Ruby Bridges by Robert Coles
- ❖ A Drop of Water: A Book of Science and Wonder by Walter Wick
- ❖ Moonshot: The Flight of Apollo 11 by Brian Floca

### *Reading suggestions: Grade Levels 4-5*

#### **Literature: Stories, Drama, Poetry**

- ❖ Alice's Adventures in Wonderland by Lewis Carroll
- ❖ Casey at the Bat" by Ernest Lawrence Thayer
- ❖ The Black Stallion by Walter Farley
- ❖ Zlateh the Goat" by Isaac Bashevis Singer
- ❖ Where the Mountain Meets the Moon by Grace Lin

#### **Informational Texts: Literary Nonfiction and Historical, Scientific, and Technical Texts**

- ❖ Discovering Mars: The Amazing Story of the Red Planet by Melvin Berger
- ❖ Hurricanes: Earth's Mightiest Storms by Patricia Lauber
- ❖ A History of US by Joy Hakim
- ❖ Horses by Seymour Simon
- ❖ Quest for the Tree Kangaroo: An Expedition to the Cloud Forest of New Guinea by Sy Montgomery

# English Language Arts 6-8

If your child is in grades 6-8, they will be reading:

- **Stories** - Includes adventure stories, historical fiction, mysteries, myths, science fiction, realistic fiction, allegories, parodies, satire and graphic novels
- **Dramas** - Includes one-act and multi-act plays, both in written form and on film
- **Poetry** - Includes narrative poems, lyrical poems, free verse poems, sonnets, odes, ballads and epics
- **Literary Nonfiction** - Includes exposition, argument and functional text in the form of personal essays, speeches and opinion pieces. Essays will be about art or literature, biographies, memoirs, journalism, historical, scientific, technical or economic accounts (including digital sources) written for a broad audience



## 6th Grade

The key focus in sixth grade becomes the analysis of works of various authors. Your child will implement the skills they learned at the elementary level to evaluate what an author is saying about a topic and cite the evidence within the work that supports the author's argument. Reading challenging texts for relevant facts, details and quotes will be the focus for this grade level. Increasing your child's vocabulary will help to synthesize these more challenging books and articles, while also improving his or her ability to write more sophisticated essays.

## 7th Grade

Refining the writing skills of your child is a key focus at the seventh grade level. Reading both classic and contemporary literature, as well as nonfiction pieces, will become more complex. Citing text based evidence will become more challenging as the reading material will become more complicated. Your child will be asked to defend his or her viewpoint, not only through writing but through speaking as well. Being able to speak clearly and concisely will facilitate your child's success in high school and beyond.

## 8th Grade

In eighth grade, your child will go beyond the analysis of what a writer is trying to say. They will evaluate if a topic is portrayed accurately. Students will need to support their conclusions about a claim through research of other materials. Your child will learn how to refine their writing by analyzing the way in which authors structure their arguments and the words they choose within their writing. Building academic vocabulary and translating figures of speech further develop your child's writing.

### Reading suggestions: Grade Levels 6-8

#### **Literature: Stories, Drama, Poetry**

- ❖ Little Women by Louisa May Alcott
- ❖ The Adventures of Tom Sawyer by Mark Twain
- ❖ The Road Not Taken by Robert Frost
- ❖ The Dark Is Rising by Susan Cooper
- ❖ Dragonwings by Laurence Yep
- ❖ Roll of Thunder, Hear My Cry by Mildred Taylor

#### **Informational Texts: Literary Nonfiction and Historical, Scientific, and Technical Texts**

- ❖ Letter on Thomas Jefferson by John Adams
- ❖ Narrative of the Life of Frederick Douglass, an American Slave by Frederick Douglass
- ❖ Blood, Toil, Tears and Sweat: Address to Parliament on May 13th, 1940 by Winston Churchill
- ❖ Harriet Tubman: Conductor on the Underground Railroad by Ann Petry
- ❖ Travels with Charley: In Search of America by John Steinbeck



# English Language Arts 9-11

Reading, writing, speaking, listening and language conventions are skills your child should master by the end of their high school career. Your child will be expected to read a variety of complex texts, make connections to other ideas, evaluate the work of others, and formulate a coherent and logical argument supported with evidence. He or she will also be able to listen and appropriately respond to a variety of perspectives.

## *Reading suggestions: Grade Levels 9-10*

### **Literature: Stories, Drama, Poetry**

- ❖ The Tragedy of Macbeth by William Shakespeare
- ❖ Ozymandias by Percy Bysshe Shelley
- ❖ The Raven by Edgar Allan Poe
- ❖ The Gift of the Magi by O. Henry
- ❖ The Grapes of Wrath by John Steinbeck
- ❖ Fahrenheit 451 by Ray Bradbury
- ❖ The Killer Angels by Michael Shaara

### **Informational Texts: Literary Nonfiction and Historical, Scientific, and Technical Texts**

- ❖ Speech to the Second Virginia Convention by Patrick Henry
- ❖ Farewell Address by George Washington
- ❖ Gettysburg Address by Abraham Lincoln
- ❖ State of the Union Address by Franklin Delano Roosevelt
- ❖ Letter from Birmingham Jail by Martin Luther King, Jr.
- ❖ Hope, Despair and Memory by Elie Wiesel

## *Reading suggestions: Grade Levels 11-CCR*

### **Literature: Stories, Drama, Poetry**

- ❖ Ode on a Grecian Urn by John Keats
- ❖ Jane Eyre by Charlotte Brontë
- ❖ Because I Could Not Stop for Death by Emily Dickinson
- ❖ The Great Gatsby by F. Scott Fitzgerald
- ❖ Their Eyes Were Watching God by Zora Neale Hurston
- ❖ A Raisin in the Sun by Lorraine Hansberry
- ❖ The Namesake by Jhumpa Lahiri

### **Informational Texts: Literary Nonfiction and Historical, Scientific, and Technical Texts**

- ❖ Common Sense by Thomas Paine
- ❖ Walden by Henry David Thoreau
- ❖ Society and Solitude by Ralph Waldo Emerson
- ❖ The Fallacy of Success by G. K. Chesterton
- ❖ Black Boy by Richard Wright
- ❖ Politics and the English Language by George Orwell
- ❖ Take the Tortillas Out of Your Poetry by Rudolfo Anaya

The enclosed information is a summary from a CCLS document located at: [http://www.p12.nysed.gov/cial/common\\_core\\_standards](http://www.p12.nysed.gov/cial/common_core_standards)



# Mathematics K-8

## Kindergarten

The foundational skills of mathematics are built in kindergarten. Addition and subtraction of small whole numbers are the foundational skills your child will need to learn. Applying addition and subtraction of small whole numbers to solve word problems are important at the kindergarten level. Having your child practice counting the number of objects to tell you how many there are will help lay the groundwork for addition and subtraction skills.

### *Key Concepts: Kindergarten*

#### **Counting and Cardinality (i.e. 1st, 2nd)**

- ✦ Know number names and count sequence
- ✦ Count to tell the number of objects
- ✦ Compare numbers

#### **Operations and Algebraic Thinking**

- ✦ Understand addition as putting together and adding to, and understand subtraction as taking apart and taking from

#### **Number and Operations in Base 10**

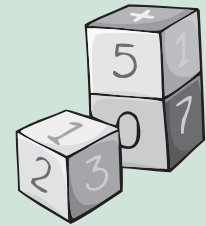
- ✦ Work with numbers 11-19 to gain foundations for place value

#### **Geometry**

- ✦ Identify and describe shapes
- ✦ Analyze, compare, create and compose shapes

#### **Measurement and Data**

- ✦ Describe and compare measurable attributes
- ✦ Classify objects in categories



## 1st Grade

In math, your first grade student will build upon what they know about addition and subtraction of small whole numbers to add and subtract with numbers up to 20. Precision and speed with these computations are critical in first grade. Learning about place value and understanding the concepts of the “tens” place and “ones” place will extend students’ knowledge to be able to add numbers up to 100.

### *Key Concepts: 1st Grade*

#### **Operations and Algebraic Thinking**

- ✦ Represent and solve problems involving addition and subtraction
- ✦ Understand and apply properties of operations and the relationship between addition and subtraction
- ✦ Add and subtract within 20
- ✦ Work with addition and subtraction equations

#### **Measurement and Data**

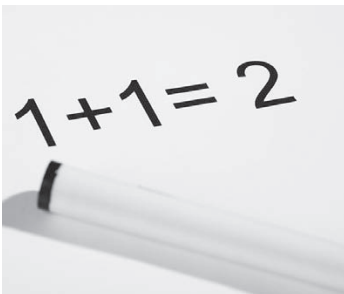
- ✦ Measure lengths indirectly and by repeating length units

#### **Number and Operations in Base 10**

- ✦ Extend the counting sequence
- ✦ Understand place value
- ✦ Use place value understanding and properties of operations to add and subtract

#### **Geometry**

- ✦ Reason with shapes and their attributes
- ✦ Tell and write time
- ✦ Represent and interpret data



# Mathematics K-8

## 2nd Grade

Addition and subtraction with two-digit numbers precisely and promptly are key skills students need to master at the end of second grade. Place value concepts are extended from “tens” and “ones” to “hundreds.” Students will be asked the meaning of the digits in each place of a three-digit number. Once students have mastered addition and subtraction, they will be asked to apply these operations to solve word problems. It is crucial that your child knows their addition and subtraction math facts by the end of second grade as they will begin to learn multiplication, division, and fractions in higher grade levels.

### *Key Concepts: 2nd Grade*

#### **Operations and Algebraic Thinking**

- ◇ Represent and solve problems involving addition and subtraction
- ◇ Add and subtract within 20
- ◇ Work with equal groups of objects to gain foundations for multiplication

#### **Number and Operations in Base 10**

- ◇ Understand place value
- ◇ Use place value understanding and properties of operations to add and subtract

#### **Measurement and Data**

- ◇ Measure and estimate lengths in standard units
- ◇ Relate addition and subtraction to length
- ◇ Work with time and money
- ◇ Represent and interpret data

#### **Geometry**

- ◇ Reason with shapes and their attributes

## 3rd Grade

Multiplication and division are two important concepts that are introduced in third grade. Your child will need to be fluent, fast and accurate, with multiplication and division of whole numbers (e.g.  $10 \times 10 = 100$ ;  $100 \div 10 = 10$ ). The relationship between the area of shapes and multiplication is highlighted in this grade level. Your child will also be introduced to fractions. Developing an understanding of the concept of fractions is critical to the future work in algebra and higher level mathematics.

$$\begin{array}{r} 23 \\ \times 3 \\ \hline 69 \end{array}$$

### *Key Concepts: 3rd Grade*

#### **Operations and Algebraic Thinking**

- ◇ Represent and solve problems involving multiplication and division
- ◇ Understand the properties of multiplication and the relationship between multiplication and division
- ◇ Multiply and divide within 100
- ◇ Solve problems involving the four operations, and identify and explain patterns in arithmetic

#### **Number and Operations – Fractions**

- ◇ Develop understanding of fractions as numbers

#### **Number and Operations in Base 10**

- ◇ Use place value understanding and figures and distinguish between linear and area measures

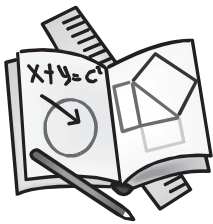
#### **Measurement and Data**

- ◇ Geometric measurement: understand concepts of area and relate area to multiplication and to addition
- ◇ Solve problems involving measurement and estimation of intervals of time, liquid volumes, and masses of objects
- ◇ Geometric measurement: recognize perimeter as an attribute of plane figures and distinguish between linear and area measures
- ◇ Represent and interpret data (Opportunity to link to multiplication and division problem solving.)
- ◇ Reason with shapes and their attributes

# Mathematics K-8

## 4th Grade

Math in this grade level builds on what your child has learned in previous grade levels by applying concepts to solve problems. Your child will take what he or she has learned about fractions and begin to add, subtract and multiply basic fractions. Students will add and subtract fractions with common denominators while writing simple decimals as fractions. Working with basic fractions will lead to the mastery of all operations with fractions in fifth and sixth grade.



### Key Concepts: 4th Grade

#### Operations and Algebraic Thinking

- ◇ Use the four operations with whole numbers to solve problems
- ◇ Gain familiarity with factors and multiples
- ◇ Generate and analyze patterns

#### Number and Operations – Fractions

- ◇ Extend understanding of fraction equivalence and ordering
- ◇ Build fractions from unit fractions by applying and extending previous understandings of operations on whole numbers
- ◇ Understand decimal notation for fractions, and compare decimal fractions

#### Number and Operations in Base 10

- ◇ Generalize place value understanding for multi-digit whole numbers
- ◇ Use place value understanding and properties of operations to perform multi-digit arithmetic

#### Measurement and Data

- ◇ Solve problems involving measurement and conversion of measurements from a larger unit to a smaller unit
- ◇ Geometric measurement: understand concepts of angle and measure angles
- ◇ Draw and identify lines and angles, and classify shapes by properties of their lines and angles
- ◇ Represent and interpret data

## 5th Grade

In math, fifth grade culminates the arithmetic that your child has learned in his or her previous grade levels. Students need to be fluent with addition, subtraction, multiplication and division of whole numbers in order to be prepared for fractions. Operations with fractions are the critical skills your child needs to master at the end of fifth grade in order to be prepared for algebra in middle school and high school. Work with fractions becomes increasingly more challenging in middle school, so it is important that a solid foundation is built by the end of the school year.

### Key Concepts: 5th Grade

#### Number and Operations in Base Ten

- ◇ Understand the place value system.
- ◇ Perform operations with multi-digit whole numbers and with decimals to hundredths.
- ◇ Write and interpret numerical expressions.
- ◇ Analyze patterns and relationships.

#### Number and Operations – Fractions

- ◇ Use equivalent fractions as a strategy to add and subtract fractions.
- ◇ Apply and extend previous understandings of multiplication and division to multiply and divide fractions.

#### Measurement and Data

- ◇ Convert like measurement units within a given measurement system.
- ◇ Geometric measurement: understand concepts of volume and relate volume to multiplication and to addition.
- ◇ Represent and interpret data.

#### Geometry

- ◇ Graph points on the coordinate plane to solve real-world and mathematical problems.
- ◇ Classify two-dimensional figures into categories based on their properties.

# Mathematics K-8

## 6th Grade

Working with ratios, variables and expressions in sixth grade provides the groundwork for algebra. Division of fractions and the introduction to positive and negative numbers sets the stage for the concepts your child will learn throughout middle school. Students will learn how to solve simple equations as well as how equations can help to solve word problems or model relationships between two quantities.



### Key Concepts: 6th Grade

#### Ratios and Proportional Relationships

- ◇ Understand ratio concepts and use ratio reasoning to solve problems

#### Expressions and Equations

- ◇ Reason about and solve one-variable equations and inequalities
- ◇ Represent and analyze quantitative relationships between dependent and independent variables

#### Statistics and Probability

- ◇ Develop understanding of statistical variability
- ◇ Summarize and describe distributions

#### The Number System

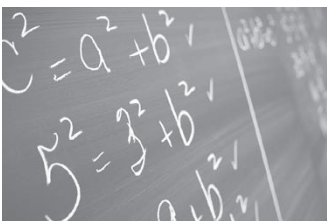
- ◇ Compute fluently with multi-digit numbers and find common factors and multiples
- ◇ Apply and extend previous understandings of numbers to the system of rational numbers
- ◇ Apply and extend previous understandings of multiplication and division to divide fractions by fractions
- ◇ Apply and extend previous understandings of arithmetic to algebraic expressions

#### Geometry

- ◇ Solve real world and mathematical problems involving area, surface area, and volume

## 7th Grade

The application of ratios and proportions to solve problems involving percentages is an important concept in seventh grade. Your child will continue to work with equations and apply what they know to solve word problems. Operations with fractions and decimals are important to solving equations in seventh grade as well as working with positive and negative numbers and how they are used to describe real world situations (e.g., temperature).



### Key Concepts: 7th Grade

#### 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 involving angle measure, area, surface area, and volume

#### Geometry

- ◇ Solve real-life and mathematical problems using numerical and algebraic expressions and equations
- ◇ Draw, construct and describe geometrical figures and describe the relationships between them

#### Statistics and Probability

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



# Mathematics K-8

## 8th Grade

Work with linear equations (equations with one or more unknown number) and functions are the key concepts for eighth-grade math. Students will be able to solve linear equations with one variable, as well as two variables. They will also know how to graph linear functions (an equation that makes a straight line on a graph) and analyze various graphs of different functions. Intense analysis of geometric figures and transformations will lay the groundwork for geometric proofs in geometry. Your child will also learn the Pythagorean Theorem and how it can be applied to solve real-world problems.

### Key Concepts: 8th Grade

#### Expressions and Equations

- ◇ Work with radicals and integer exponents
- ◇ Understand the connections between proportional relationships, lines, and linear equations
- ◇ Analyze and solve linear equations and pairs of simultaneous linear equations

#### Functions

- ◇ Define, evaluate and compare functions
- ◇ Use functions to model relationships between quantities

#### The Number System

- ◇ Know that there are numbers that are not rational, and approximate them by rational numbers

#### Geometry

- ◇ Solve real world and mathematical problems involving volume of cylinders, cones, and spheres
- ◇ Understand and apply the Pythagorean Theorem
- ◇ Understand congruence and similarity using physical models, transparencies, or geometry software

#### Statistics and Probability

- ◇ Investigate patterns in data that involves two variables



# Mathematics 9-12

## 9th-12th Grades

Math at the high school level takes what your child has learned up through middle school and applies those skills and concepts to the fields of science, technology, engineering and mathematics. Probability and statistics allow for the analysis of data from real world situations to make judgments and draw conclusions. By the end of high school, your child should be able to study and apply mathematics to a variety of situations and solve problems in the real world.

The following are the key concepts for high school. These concepts will be taught over a three year period (minimally) and will end with the following Regents Exams: Algebra, Geometry and Algebra II/Trigonometry.



### Number and Quantity

#### Quantities

- ✧ Reason quantitatively and use units to solve problems

#### The Real Number System

- ✧ Extend the properties of exponents to rational exponents

#### The Complex Number System

- ✧ Perform arithmetic operations with complex numbers

#### The Real Number System

- ✧ Use properties of rational and irrational numbers

#### The Complex Number System

- ✧ Represent complex numbers and their operations on the complex plane
- ✧ Use complex numbers in polynomial identities and equations

#### Vector and Matrix Quantities

- ✧ Represent and model with vector quantities
- ✧ Perform operations on vectors
- ✧ Perform operations on matrices and use matrices in applications

### Algebra

#### Seeing the Structure in Expressions

- ✧ Interpret the structure of expressions
- ✧ Write expressions in equivalent forms to solve problems

#### Arithmetic with Polynomials and Rational Expressions

- ✧ Perform arithmetic operations on polynomials
- ✧ Understand the relationship between zeros and factors of polynomials

#### Creating Equations

- ✧ Create equations that describe numbers or relationships

#### Reasoning with Equations and Inequalities

- ✧ Understand solving equations as a process of reasoning and explain the reasoning
- ✧ Solve equations and inequalities in one variable
- ✧ Solve systems of equations

#### Arithmetic with Polynomials and Rational Expressions

- ✧ Rewrite rational expressions

#### Reasoning with Equations and Inequalities

- ✧ Represent and solve equations and inequalities graphically

#### Arithmetic with Polynomials and Rational Expressions

- ✧ Use polynomial identities to solve problems

# Mathematics 9-12

## 9th-12th Grades



### Functions

#### Interpreting Functions

- ✧ Understand the concept of a function and understand function notation
- ✧ Interpret functions that arise in applications in terms of the context
- ✧ Analyze functions using different representations

#### Building Functions

- ✧ Build a function that models a relationship between two quantities

#### Linear, Quadratic and Exponential Models

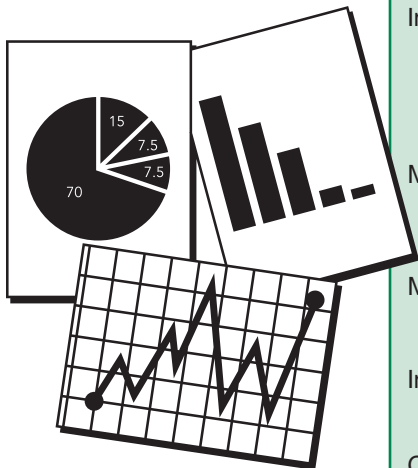
- ✧ Construct and compare linear, quadratic and exponential models and solve problems
- ✧ Interpret expressions for functions in terms of the situation they model

#### Building Functions

- ✧ Build new functions from existing functions

#### Trigonometric Functions

- ✧ Extend the domain of trigonometric functions using the unit circle
- ✧ Model periodic phenomena with trigonometric functions
- ✧ Prove and apply trigonometric identities



### Statistics and Probability

#### Interpreting Categorical and Quantitative Data

- ✧ Summarize, represent and interpret data on a single count or measurement variable
- ✧ Summarize, represent, and interpret data on two categorical and quantitative variables

#### Making Inferences and Justifying Conclusions

- ✧ Make inferences and justify conclusions from sample surveys, experiments, and observational studies

#### Making Inferences and Justifying Conclusions

- ✧ Understand and evaluate random processes underlying statistical experiments

#### Interpreting Categorical and Quantitative Data

- ✧ Interpret linear models

#### Conditional Probability and the Rules of Probability

- ✧ Understand independence and conditional probabilities of compound events in a uniform probability model
- ✧ Use the rules of probability to compute probabilities of compound events in a uniform probability model

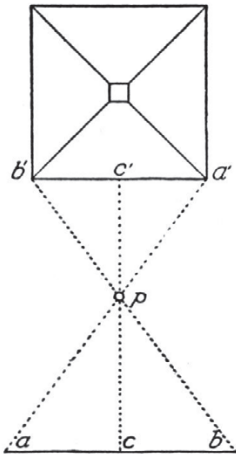
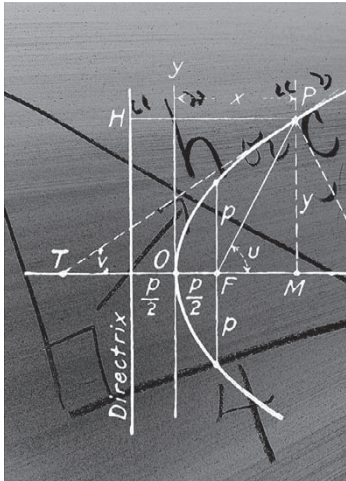
#### Using Probability to Make Decisions

- ✧ Calculate expected values and use them to solve problems
- ✧ Use probability to evaluate outcomes of decisions



# Mathematics 9-12

## 9th-12th Grades



### Geometry

#### Congruence

- ◆ Prove geometric theorem.

#### Expressing Geometric Properties with Equations

- ◆ Use coordinates to prove simple theorems algebraically

#### Similarity, Right Triangles, and Trigonometry

- ◆ Define trigonometric ratios and solve problems involving right triangles

#### Modeling with Geometry

- ◆ Apply geometric concepts in modeling situations

#### Congruence

- ◆ Experiment with transformations in the plane
- ◆ Understand congruence in terms of rigid motions
- ◆ Make geometric constructions

#### Circles

- ◆ Understand and apply theorems about circles
- ◆ Find arc lengths and areas of sectors of circles

#### Similarity, Right Triangles, and Trigonometry

- ◆ Understand similarity in terms of similarity transformations

#### Similarity, Right Triangles, and Trigonometry

- ◆ Prove theorems involving similarity
- ◆ Apply trigonometry to general triangles

#### Geometric Measurement and Dimension

- ◆ Explain volume formulas and use them to solve problems
- ◆ Visualize relationships between two-dimensional and three-dimensional objects

#### Expressing Geometric Properties with Equations

- ◆ Translate between the geometric description and the equation for a conic section.

## Talking to Your Child's Teacher:

Ask the teacher questions such as:

- How is my child doing against grade level expectations?
- If my child needs to improve, how can I help?
- Are there resources to help his or her learning outside the classroom?

