

# NFC ACADEMY



## MATH 700 COURSE OVERVIEW

Mathematics 700 is designed to prepare junior-high students for Pre-algebra. This course focuses on strengthening needed skills in problem solving, number sense, and proportional reasoning. It also introduces students to integers, equations, and geometric concepts. Students will begin to see the "big picture" of mathematics and learn how numeric, algebraic, and geometric concepts are woven together to build a foundation for higher mathematical thinking.

### OBJECTIVES

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- **INTEGERS:** Students will learn how to locate, add, subtract, multiply, and divide integers to solve word problems, as well as compare integers using absolute value and the order of operation.
- **FRACTIONS:** Students will understand how fractions can be written into other forms without changing their value, and how to add, subtract, multiply, and divide fractions.

- **DECIMALS:** Students will explore how to rewrite fractions as decimals, and how to use decimals to solve real-world problems.
- **PATTERNS AND EQUATIONS:** Students will learn how to translate words into equations and use them to solve number patterns.
- **RATIOS AND PROPORTIONS:** Students will explore how to use ratios to compare numbers, solve proportions, and convert between percent, decimals, and fractions.
- **PROBABILITY AND GRAPHING:** Students will be able to determine the probability of an event, and if they are independent or dependent events, as well as create a graph of an equation
- **DATA ANALYSIS:** Students will learn how to interpret statistics using stem-and-leaf plots, histograms, and other graphical means.
- **GEOMETRY:** Students will explore how points, lines, and planes interact and how to solve equations using their information.
- **MEASUREMENT AND AREA:** Students will learn about finding perimeters and areas of different polygons and using the Pythagorean theorem to solve problems.
- **SURFACE AREA AND VOLUME:** Students will explore three-dimensional figures and how to find their surface area, volume of them.

## **CURRICULUM CONTENT AND SKILL FOCUS**

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### **UNIT 1: INTEGERS**

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- Locate integers on the number line.
- Determine the absolute value of a number and use it in an inequality statement.
- Add, subtract, multiply, and divide integers, both of same and different signs
- Identify the associative, commutative, and identity properties.

- Use the associative, commutative, distributive, and identity properties to simplify expressions.
- Use the order of operations, and exponents to simplify expressions.

## **UNIT 2: FRACTIONS**

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- Convert between mixed numbers and improper fractions.
- Identify equivalent fractions, and mixed numbers.
- Identify fractions written in simplest form, and the reciprocal of a given fraction.
- Use a factor tree to find the prime factorization of a number.
- Find the GCF and LCM of a set of numbers.
- Add, subtract, multiply, and divide fractions with like and unlike denominators, and mixed numbers.

## **UNIT 3: DECIMALS**

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- Recognize the decimal place value and put groups of decimals in ascending and descending order.
- Round decimals to specified place values and distinguish between terminating and repeating decimals.
- Add, subtract, multiply and divide decimals.
- Calculate the product of two decimal numbers, of a whole number and a decimal number, and the quotient of two decimal numbers.
- Interpret and write numbers in scientific notation.
- Identify and convert metric units using multiplication or division.

## **UNIT 4: PATTERNS AND EQUATIONS**

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- Use a variable to represent an unknown number.
- Translate between word sentences and mathematical equations.
- Evaluate expressions for specific variables, and substitute values in for variables in an expression.
- Identify arithmetic and geometric sequences and find the next term in the sequence.

- Translate a verbal phrase to a mathematical expression, and word problems into two-step equations and then solve.
- Solve equations using addition, subtraction, multiplication, division, and mental math.
- Solve two-step equations using the four basic operations.

## **UNIT 5: RATIOS AND PROPORTIONS**

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- Compare ratios using unit rates.
- Write and solve proportions.
- Convert between customary units, and units in the metric system.
- Use proportions to find missing lengths.
- Convert fractions and decimals to percent, and percent to fractions and decimals.
- Find the percent of a number and calculate a percent of change.
- Solve percent problems using a proportion or an equation.

## **UNIT 6: PROBABILITY AND GRAPHING**

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- Determine the theoretical and experimental probability of an event.
- Use the counting principle to find the sample space.
- Determine if events are independent or dependent and determine the probability of independent and dependent events.
- Use a table to graph a linear equation.
- Given a graph of a linear function, write the equation, and determine the slope of the line.
- Determine if a function is a direct variation and identify the slope of the direct variation.
- Graph direct variations.

## **UNIT 7: DATA ANALYSIS**

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- Determine the mean, median, mode and range of a set of data, and decide which measure of central tendency should be used in a situation.

- Determine the effect of outliers on an average, and on the range and the interquartile range.
- Interpret and construct a stem-and-leaf plot, or a box-and-whisker plot.
- Interpret and construct line, bar, and double bar graphs, and use them to make predictions about the data.
- Determine the percent and degree measures of sections on a circle graph.
- Construct and interpret circle graphs, and scatter plots, and make predictions from a set of data represented by a scatter plot.
- Understand how to create and organize a financial assets and liabilities record and construct a net worth statement
- Understand how to apply math to real life situations, use a family budget estimator, and analyze and compare monetary incentives

## **UNIT 8: GEOMETRY**

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- Measure angles using a protractor and identify special pairs of angles.
- Use angle properties to determine missing angle measures.
- Determine the measure of an interior angle of a regular polygon.
- Inscribe regular polygons in circles using a protractor, compass, and straight edge.
- Identify and classify types of triangles and quadrilaterals, find missing angle measures, and draw them given their characteristics.
- Identify corresponding parts of similar and congruent figures and use them to solve problems.
- Determine if a figure has line or rotational symmetry
- Determine the coordinates of an image following a reflection, translation, or compound transformation.

## **UNIT 9: MEASUREMENT AND AREA**

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- Calculate the perimeter of a polygon and use its perimeter to find a missing side length.
- Calculate the circumference of a circle and use the circumference of a circle to find the radius or diameter.
- Calculate the perimeter of a composite figure and use the area of a composite figure to find a missing measurement.

- Calculate the area of a triangle, trapezoid, circle, parallelogram, or composite figure.
- Determine the area of a figure after its dimensions have changed.
- Calculate the square of a number, and the square root of a number.
- Identify a Pythagorean triple, and apply the Pythagorean theorem to solve for a missing length of a side of a right triangle and solve word problems.

## **UNIT 10: SURFACE AREA AND VOLUME**

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- Classify and identify solid figures.
- Explain what surface area and volume mean and find the surface area or volume of a solid figure.
- Use a formula to find the surface area or volume of a cylinder, rectangular prism, or triangular prism.
- Determine how the surface area or volume of a solid figure is affected by a change in the dimensions.
- Find the surface area or volume of a solid figure given a change in the dimensions.
- Identify the shape of a cross section.

## **REQUIRED RESOURCES**

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Some assignments in this course require the use of resources that must be supplied by the user. These outside resources are listed below by assignment.

<b>MATHEMATICS 700</b>		
<b>Unit</b>	<b>Assignment Title</b>	<b>Supply List</b>
All	All Assignments	Scratch Paper
8	Project: Inscribed Polygons	Pencil Paper Protractor

		Compass Ruler
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## **GRADING INFORMATION**

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### **GRADING COMPONENTS**

Lessons	30%
Quizzes	25%
Projects	15%
Tests	30%

### **GRADING SCALE**

100-90	A
89-80	B
79-70	C
69-60	D
Below 60	F