Foundations for Algebra

Course Syllabus

Prince George's County Public Schools

PGCPS Mathematics

Prerequisites: Successful completion of Math 7

This course continues the trajectory towards a more formalized understanding of mathematics that occurs at the high school level and was begun in Math 6 and 7. Students extend their understanding of rational numbers to develop an understanding of irrational numbers; connect ratio and proportional reasoning to lines and linear functions; define, evaluate, compare, and model with functions; build understanding of congruence and similarity; understand and apply the Pythagorean Theorem; and extend their understanding of statistics and probability by investigating patterns of association in bivariate data. In addition to this, Foundations for Algebra students extend their understanding to additional high school mathematics topics. Students in Foundations for Algebra will have assignments that reflect the inherent rigor of honors level courses. Included will be long-term projects and problem-based assignments that offer students the opportunity to directly apply mathematics at a more complex level.

The Standards for Mathematical Practice apply throughout each course. These standards, together with the content standards, prescribe that students experience mathematics as a coherent, useful, and logical subject that makes use of their ability to make sense of problem situations.

INTRODUCTION:

To understand the majority of the information in a mathematics classroom, it is necessary to continuously practice your skills. This requires a tremendous amount of effort on the student's part. Each student should dedicate study time for his/her mathematics class. Some hints for success in a Math class include: attending class daily, asking questions in class, and thoroughly completing all homework problems with detailed solutions as soon as possible after each class session.

INSTRUCTOR INFORMATION:

NAME:
E-MAIL ADDRESS:
PLANNING TIME:
SCHOOL PHONE NUMBER:

CLASS INFORMATION:

COURSE NUMBER:
CLASS MEETS:
ROOM:
TEXT: *Big Ideas Advanced 3 (Orange), Lawson & Boswell*
    *Students can access the text through clever.pgcps.org

CALCULATORS:

For Foundations for Algebra, a scientific calculator is required. The graphing calculator will be used for instruction of some extended high school math topics; however, it is not required.

GRADING:

Middle School Mathematics

Overview: The goal of grading and reporting is to provide the students with feedback that reflects their progress towards the mastery of the Maryland College and Career-Ready Standards found in the Mathematics Curriculum Framework Progress Guide.

Factors	Brief Description	Grade Percentage Per Quarter
Classwork	This includes all work completed in the classroom setting. Including: • Group participation • Notebooks • Vocabulary • Written responses • Group discussions • Performance Task • Hands-On Labs • Project Collaboration • Reassessed assignments • Completion of assignments	**35%**
Independent Assignments	This includes all work completed outside the classroom. Assignments can include, but are not limited to: • Problem of the Week • On-line Practice • Opportunities for Self-Correction and Revisions • Journals • Projects	**25%**
Assessment	This category entails both traditional and alternative methods of assessing student learning: • Group discussions • Performance Tasks • Problem Based Assessments • Exams • Quizzes • Research/Unit Projects • Portfolios • Oral Presentations • Surveys ***An instructional rubric should be created to outline the criteria for success and scoring for each alternative assessment.***	**40%**

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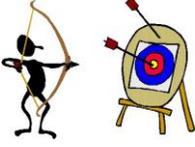Student's Name   Parent's/Guardian's Signature   Date

FOUNDATIONS FOR ALGEBRA
Course Sequence

Cluster		Standard	Math 7 Q4/ Algebra Extensions
The Modeling Cycle – 8.SP.4 (4 days)			
Unit 1: Functions (Quarter 1)			
Part A: Defining Functions		8.F.1	F.IF.1
	8.F.A: Define, evaluate, and compare functions.		F.IF.1, F.IF.5
		8.F.2	
	8.EE.B: Understand the connections between proportional relationships, lines, and linear equations.	8.EE.5	
Part B: Linear Functions	8.EE.B: Understand the connections between proportional relationships, lines, and linear equations.	8.EE.6	
	8.F.A: Define, evaluate, and compare functions.	8.F.3	F.LE.1b
	8.F.B: Use functions to model relationships between quantities.	8.F.4	F.IF.2
		8.F.5	F.LE.1b
			F.BF.2, F.IF.3, F.LE.2
Unit 2: Linear Relationships (Quarter 2)			
Part A: Linear Equations	8.EE.C: Analyze and solve linear equations ~~and pairs of simultaneous linear equations.~~	8.EE.7	A.REI.1, A.CED.4, A.REI.3, A.REI.10, F.IF.4, F.IF.6, A.CED.1-3
Part B: Scatter Plots and Systems	8.EE.C: Analyze and solve ~~linear equations and~~ pairs of simultaneous linear equations	8.EE.8	A.CED.3
	8.SP.A: Investigate patterns of association in bivariate data.	8.SP.1	7.SP.1 – 7.SP.4
		8.SP.2	
		8.SP.3	
		8.SP.4	
Unit 3: Geometry (Quarter 3)			
Part A: Pythagorean Theorem	8.NS.A: Know that there are numbers that are not rational, and approximate them by rational numbers.	8.NS.1	7.G.4
		8.NS.2	
	8.EE.A: Work with radicals and integer exponents.	8.EE.2	
	8.G.B: Understand and apply the Pythagorean Theorem.	8.G.6	7.G.2
		8.G.7	
		8.G.8	
Part B: Transformations	8.G.A : Understand congruence and similarity using physical models, transparencies, or geometry software.	8.G.5	7.G.5
		8.G.1	7.G.3
		8.G.2	
		8.G.3	
		8.G.4	
Unit 4: Exponents and Exponential Functions (Quarter 4)			
Part A: Exponents	8.EE.A: Work with radicals and integer exponents.	8.EE.1	
		8.EE.3	
		8.EE.4	
	8.G.C: Solve real-world and mathematical problems involving volume of cylinders, cones, and spheres.	8.G.9	7.G.6
Part B: Exponential Functions	Algebra 1 – Simplify expressions with rational exponents and interpret, graph, and evaluate exponential functions.		N.RN.1-3, A.REI.3, A.REI.11, F.LE.1a, F.LE.2, F.BF.2, F.IF.3

Key: ■ Major Cluster ■ Supporting Cluster ■ Additional Cluster

Standards for Mathematical Practice	Student Friendly Language
1. Make sense of problems and persevere in solving them.	• I can try many times to understand and solve a math problem.
2. Reason abstractly and quantitatively.	• I can think about the math problem in my head, first.
3. Construct viable arguments and critique the reasoning of others.	• I can make a plan, called a strategy, to solve the problem and discuss other students' strategies too.
4. Model with mathematics.	• I can use math symbols and numbers to solve the problem.
5. Use appropriate tools strategically.	• I can use math tools, pictures, drawings, and objects to solve the problem.
6. Attend to precision.	• I can check to see if my strategy and calculations are correct.
7. Look for and make use of structure.	• I can use what I already know about math to solve the problem.
8. Look for and express regularity in repeated reasoning.	• I can use a strategy that I used to solve another math problem.

Standards for Mathematical Practice
Parents' Guide

The Standards for Mathematical Practice describe varieties of expertise that mathematics educators at all levels should seek to develop in their students. As your son or daughter works through homework exercises, you can help him or her develop skills with these Standards for Mathematical Practice by asking some of these questions:

1. Make sense of problems and persevere in solving them.
- What are you solving for in the problem?
- Can you think of a problem that you have solved before that is like this one?
- How will you go about solving it? What's your plan?
- Are you making progress toward solving it? Should you try a different plan?
- How can you check your answer? Can you check using a different method?

2. Reason abstractly and quantitatively.
- Can you write or recall an expression or equation to match the problem situation?
- What do the numbers or variables in the equation refer to?
- What's the connection among the numbers and the variables in the equation?

3. Construct viable arguments and critique the reasoning of others.
- Tell me what your answer means.
- How do you know that your answer is correct?
- If I told you I think the answer should be (offer a wrong answer), how would you explain to me why I'm wrong?

4. Model with mathematics.
- Do you know a formula or relationship that fits this problem situation?
- What's the connection among the numbers in the problem?
- Is your answer reasonable? How do you know?
- What does the number(s) in your solution refer to?

5. Use appropriate tools strategically.
- What tools could you use to solve this problem? How can each one help you?
- Which tool is more useful for this problem? Explain your choice.
- Why is this tool (the one selected) better to use than (another tool mentioned)?
- Before you solve the problem, can you estimate the answer?

6. Attend to precision.
- What do the symbols that you used mean?
- What units of measure are you using? (for measurement problems)
- Explain to me (a term from the lesson).

7. Look for and make use of structure.
- What do you notice about the answers to the exercises you've just completed?
- What do different parts of the expression or equation you are using tell you about possible correct answers?

8. Look for and express regularity in repeated reasoning.
- What shortcut can you think of that will always work for these kinds of problems?
- What pattern(s) do you see? Can you make a rule or generalization?