

Integrated Math 3 Curriculum Guide

Number: 324
Level: General
Textbook: Pre-Algebra, an Integrated Transition to Algebra and Geometry,
Glencoe/McGraw-Hill 2001.
Workbooks: Measuring Up to the New Jersey Core Curriculum Content Standards
for the HSPA., People's Publishing Group, 2005.
Preparing for the New Jersey HSPA Grade 11, Amsco 2001
Credits: 5
Written: July 2005
Revised: August 2008

Midterm Exam Revised: January 2008

Final Exam Revised: June 2008

I. Prerequisite:

Students are placed in this course based on teacher recommendation and scores on a local HSPA screening test given in the spring. Students who have passed the HSPA may not enroll in this course.

II. Course Description:

Integrated Math 3 is designed to provide an intensive review for the HSPA. Therefore, students who have already passed the HSPA may not enroll in this course. This course will also review basic algebraic concepts to prepare students for a formal course in algebra. Integrated Math 3 is coordinated with both the Core Content Curriculum Standards and the HSPA proficiencies. Areas studied are number sense, concepts and applications, spatial sense and geometry, data analysis, probability, statistics, discrete mathematics, patterns, functions and algebra. The workbook will be used from the beginning of the year until the HSPA in March. There will be a concentrated mixed review for the HSPA two weeks before the test. After the HSPA Test is taken the Pre-Algebra book will be used. Mathematical reasoning and problem solving are emphasized throughout the course.

III. Course Objectives

Students will be able to:

1. Pass the HSPA in March.
2. Gain a background in Pre-Algebra, enabling them to be successful in Algebra the following year.

IV. Description of Instruction

Students are expected to be active participants in the learning process and the teacher serves as a facilitator of the learning process. Understanding of concepts is stressed rather than rote memorization of skills, relating the work to students' prior knowledge. Class discussions enable students to clarify their understanding of the material being presented. Students will be encouraged to think mathematically and communicate about mathematics through class activities and cooperative learning situations. The student is expected to participate actively in these situations, contributing his/her ideas and asking questions.

Homework will be given almost every day and is an important part of the course, providing students the opportunity to both practice concepts learned in class and strengthen their understanding of the material. It is imperative that students do homework regularly and conscientiously. Homework will be reviewed in class and it is the student's responsibility during the time to ask questions about problems that he/she doesn't understand and to identify specific errors.

Calculators will be used throughout the course to encourage, discovery, problem solving and to apply mathematics to real life situations. Number sense, estimation and proper methods of using the calculator will be discussed.

V. District Policy: Academic Integrity

Pupils are expected to be honest in all of their academic work. This means that the students in this course will not engage in any of the following acts:

- Cheating on examinations or other school assignments, including but not limited to, the non-authorized use of books or notes, the use of crib sheets, copying from other students' papers, exchanging information with other students orally, in writing, or by signals, obtaining copies of the examination illegally and other similar activities. Cheating through the use of technology to exchange information on any school assignment, examination, etc. is prohibited. Technology is defined as, but not limited to, computers, telephones, text messaging, palm pilots, calculators, cameras or any other hand held device.
- Plagiarism is not permitted in term papers, themes, essays, reports, images, take-home examinations, and other academic work. Plagiarism is defined as stealing or use without acknowledgment of the ideas, words, formulas, textual materials, on-line services, computer programs, etc. of another person, or in any way presenting the work of another person as one's own.
- Falsifications, including forging signatures, altering answers after they have been graded, inserting answers after the fact, erasing of grader's markings, and other acts that allow for falsely taking credit.

A pupil found guilty of academic dishonesty may be subjected to a full range of penalties including, but not limited to reprimand and loss of credit for all of the work that is

plagiarized. Disciplinary action may also be a consequence of such behavior. Additional consequences may apply as defined in specific department policies and guidelines.

A teacher who believes that a pupil has been academically dishonest in his/her class should resolve the matter in the following manner:

- Reprimand the student orally and/or in writing. The teacher is also authorized to withhold credit in the work due to academic dishonesty.
- If warranted, the teacher shall file a written complaint against the student with the Administration, requesting a more stringent form of discipline. The complaint must describe in detail the academic dishonesty that is alleged to have taken place, and must request that the matter be reviewed by the Administration.
- The Administration will determine if further discipline of the pupil is appropriate, and will determine the nature of the discipline on a case-by-case basis.
- If the pupil is not in agreement with the disciplinary action of the Administration, he/she may appeal the action first to the Principal and secondly to the Superintendent. If the pupil is dissatisfied with the Superintendent's disposition of the case, he/she may grieve the action in accordance with Policy No. 5710, Pupil Grievance.

VI. District Policy: Equal Opportunity

High Point Regional High School's curriculum and instruction are aligned to the State's Core Curriculum Content Standards and address the elimination of discrimination by narrowing the achievement gap, by providing equity in educational programs and by providing opportunities for students to interact positively with others regardless of race, creed, color, national origin, ancestry, age, marital status, affectional or sexual orientation, gender, religion, disability or socio-economic status.

VII. Student Evaluation

Quizzes, based on the course proficiencies, will be given once or twice a week. Major tests will be given at the end of each unit. An exam will be given at the end of each semester, covering all the work of the semester.

Homework will be checked daily. It will usually not be graded, but will be considered satisfactory if the work shown indicates that the student has made a conscientious effort to complete the assignment. Sometimes the homework may be collected and graded. This will be done only when the concept has been thoroughly discussed and practiced previously. Classwork, including group work, will be evaluated. The student's participation in the class assignment, as well as the completed assignment will be considered in the grade.

Grades will be calculated according to the grading policy and the following guidelines.

- A. Marking Period Grade
 - 1. Quizzes and Tests 70-80%

2. Homework and Classwork 20-30%
(Each teacher will explain his/her grading policy for homework and classwork.)

B. Final Grade

1. Each Marking Period 20%
2. Midterm 10%
3. Final exam 10%

Note to Teachers

The proficiencies, not the textbook and workbook, are to be used as a guide for the course. At the end of the proficiencies, there are many worksheets containing HSPA problems with mixed skills, taken from various other sources. It is imperative that the teacher include these sheets in every unit (at least weekly) so that students get used to seeing the skills all mixed together. There are also two workbooks from Learning Express which may be used to supplement the course.

Scientific calculators are available and students should be permitted to use them throughout the course. Correct methods of using calculators should be discussed. The teacher needs to stress “number sense” and estimation so that students can recognize calculator errors. Although students may use calculators, the emphasis remains on the process, not the answer. Thus students should be required to show work, indicating the operations they did with their calculators.

Goal: Students will use number sense and number concepts in real world applications in order to pass the HSPA.

Objectives:

Students will be able to:

1. Categorize and order real numbers.
2. Use exponents to simplify expressions, evaluate expressions containing negative and fractional exponents.
3. Evaluate expressions and solve equations, which contain absolute values.
4. Use scientific notation to express, multiply, and divide very large and very small numbers.
5. Recognize and apply the properties of equality.
6. Recognize and apply the properties of addition and multiplication.
7. Categorize numbers as prime or composite and, if composite, find its prime factorization.
8. Find the greatest common factor and the least common multiple, given two or more numbers.
9. Add and subtract matrices and perform scalar multiplication on matrices.
10. Construct a matrix given a word problem.
11. Solve equations using percents and proportions.

Resources:

1. Workbook pp. 1-71.
2. Teacher generated, mixed review worksheets.
3. Learning Express Worksheets.

New Jersey Core Content Curriculum Standards Addressed:

- 4.1: A.1, A2, A3, B1, B2, B3, B4.
4.4: D2.
4.5: A1, A2, A3, B1, B2, B4, C3, C4, C6, D1, D2, D5, E1, F1, F4

Unit 2**Spatial Sense and Geometry****29 Days**

Goal: Students will develop spatial sense and use geometry in a variety of ways in order to pass the HSPA.

Objectives:

Students will be able to:

1. Identify the figures that represent: geometric concepts, closed shapes in a plane and solid shapes.
2. Classify different two dimensional shapes and determine their angle measures.
3. Use geometric terms to describe three dimensional figures.
4. Identify: pairs of angles formed by parallel lines and transversals, supplementary and congruent angle pairs and lines and segments associated with circles.
5. Identify and draw different transformations.
6. Determine if two polygons tessellate and draw the tessellation.
7. Find the precision of a measurement in terms of fractional or decimal units.
8. Find the area of parallelograms, triangles, trapezoids and circles.
9. Find the area under a curve using rectangles and trapezoids.
10. Find the surface area of rectangular prisms and cylinders.
11. Use coordinates of points to find distance.
12. Add and subtract vectors.
13. Find the volume of a prism, pyramid, cylinder, cone and sphere.
14. Use the Pythagorean Theorem to find the missing side of a right triangle.
15. Use the sine, cosine and tangent to find missing sides and angles in a right triangle.

Resources:

1. Workbook pp. 72–167.
2. Teacher generated, mixed review worksheets.
3. Learning Express Worksheets.

New Jersey Core Content Curriculum Standards Addressed:

- 4.1: A2, C1.
4.2: A1, A2, A3, A4, B1, B2, B3, C1, C2, C3, C4, C5, C6, E1, E2.
4.5: A1, A2, A3, B1, B2, B3, B4, C1, C2, C3, C4, C5, C6,
D1, D2, D3, D4, D5, D6, E1, E2, E3, F1, F5.

Unit 3 Data Analysis, Probability, Statistics, and Discrete Mathematics 27 Days

Goal: Students will make decisions about real world situations by analyzing data, using probability and statistics, in order to pass the HSPA.

Objectives:

Students will be able to:

1. Find the probability of independent and dependent events.
2. Find the conditional probability of an event.
3. Use experimental probability to make predictions about the outcome of future events.
4. Find the mean, median, mode, and range for a set of data and decide which gives the best indication of the central tendency.
5. Determine if the results of a survey are biased.
6. Identify what each axis represents for the scatter plot, approximate the correlation and the line of best fit and make decisions about the plot.
7. Use the 5-number summary to create box-and-whisker plots.
8. Make decisions about data based on comparisons of their box-and-whisker plots.
9. Find the standard deviation of a number and use it to make decisions about the data.
10. Interpret the data presented in a line graph, bar graph, pictograph, or circle graph.
11. Create a tree diagram to determine the outcome of compound events.
12. Use and compute factorials, combinations and permutations.
13. Use a matrix to represent a network.
14. Identify the shortest path between two points in a network and determine if it is complete and/or traceable.
15. Create a network to represent a situation.
16. Identify and describe an iterative process; use it to predict the following stages, and create the fractal.
17. Analyze and apply a recursive equation.

Resources

1. Workbook pp. 168-256.
2. Teacher generated, mixed review worksheets.
3. Learning Express Worksheets.

New Jersey Core Content Curriculum Standards Addressed:

- 4.2: B4.
4.3: C3.
4.4: A1, A2, A3, A4, A5, B1, B2, B3, B4, B5, B6, C1, C2, C3, C4, D1.
4.5: A1, A2, A3, A4, A5, B1, B2, B3, C1, C2, C3, C4, C5, C6,
D1, D2, D3, D4, D5, D6, E1, E3, F1, F2, F3, F4.

Goal: Students will learn to make connections between patterns, functions, equations, and graphs in order to pass the HSPA.

Objectives:

Students will be able to:

1. Identify the pattern in a series of geometric figures, and continue the pattern.
2. Determine if a pattern is arithmetic or geometric, find the pattern and continue it.
3. Solve linear equations and inequalities and quadratic equations.
4. Identify the domain and range of a relation.
5. Graph a relation and use the graph to find another ordered pair.
6. Use a table to graph a relation.
7. Calculate the slope of a line and determine the y-intercept.
8. Recognize and apply exponential and step functions.
9. Use direct and inverse variation.
10. Use the distance formula to determine the length of a line segment.
11. Use the midpoint formula to find the midpoint of a line segment.
12. Determine whether lines are parallel or perpendicular based on their slope.
13. Use the slope and y-intercept of a line to determine its equation.
14. Use substitution to solve a system of equations.
15. Use elimination to solve a system of equations.
16. Identify how the translation of a line affects the equation of that line.

Resources

1. Workbook pp. 257-331
2. Teacher generated, mixed review worksheets.
3. Learning Express Worksheets.

New Jersey Core Content Curriculum Standards Addressed:

- 4.1: B1, D1, D2, D3.
4.2: C1.
4.3: A1, A3, B1, B2, B3, B4, C1, C2.
4.5: A1, A2, A4, A5, B1, B2, B4, C1, C2, C3, C4, C6,
E1, E2, E3, F3, F4, F6.

Unit 5**Solving Equations and Inequalities****16 Days**

Goal: Students will solve equations and inequalities using a variety of methods in a variety of situations.

Objectives:

Students will be able to:

1. Solve word problems, by using the strategy of working backwards.
2. Solve 2-step equations.
3. Solve word problems by setting up 2 step equations.
4. Solve words problems, by setting up equations using the formula for the circumference of a circle.
5. Solve equations with variables on both sides.
6. Solve multi-step inequalities.
7. Solve word problems by setting up inequalities.
8. Make conversions working within the metric system.

Resources

1. Textbook, Chapter 7
2. Textbook generated and teacher generated worksheets.
3. Continue to use the HSPA mixed review worksheets.

New Jersey Core Content Curriculum Standards Addressed:

- 4.3: B1, B2, C1, D2
4.5: A2, A3, B4, D4, F1

Unit 6**Functions and Graphing****19 days**

Goals: Students will make connections between Functions, Graphs, and Equations.

Objectives:

Students will be able to:

1. State the domain and range of a relation given a graph, a set of points, or a table.
2. Draw and interpret scatter plots.
3. Graph linear equations.
4. Solve equations for a given domain.
5. Solve word problems by drawing and interpreting a graph.
6. Find the slope of a line by using two points on that line.
7. Find the y-intercept of a line by solving a linear equation for y.
8. Find the solution for a system of equations by graphing.
9. Graph inequalities.

Resources

1. Textbook, Chapter 8
2. Textbook generated and teacher generated worksheets.
3. Continue to use the HSPA mixed review worksheets.

New Jersey Core Content Curriculum Standards Addressed

4.5: B4, C2, D4, E1, F1

Unit 7**Measuring Area and Volume****16 days**

Goals: Students will find the area and volume to a variety of shapes, and use that information to solve real life problems.

Objectives:

Students will be able to:

1. Use the skill of finding the area of parallelograms, triangles, and trapezoids, to find the area of complex figures.
2. Use the skill of finding the area of circles, to find the area of complex figures.
3. Find geometric probabilities.
4. Students will be able to solve word problems by making a model or drawing.
5. Find the surface area of prisms and cylinders.
6. Find the surface area of pyramids and cones.
7. Find the volume of prisms and cylinders.
8. Find the volume of pyramids and cones.

Resources

1. Textbook, Chapter 12
2. Textbook generated and teacher generated worksheets.
3. Continue to use the HSPA mixed review worksheets.

New Jersey Core Content Curriculum Standards Addressed

- 4.2: E2
- 4.3: B2
- 4.5: B4, D4, E1, F1

Unit 8**Polynomials****16 days**

Goals: Students will become familiar with polynomials, and learn to add, subtract, and multiply them.

Objectives:

Students will be able to:

1. Identify, and state the degree of polynomials.
2. Evaluate polynomials using substitution.
3. Add polynomials.
4. Subtract polynomials
5. Simplify polynomials involving exponents.
6. Multiply a polynomial by a monomial.
7. Multiply binomials.

Resources

1. Textbook, Chapter 14
2. Textbook generated and teacher generated worksheets.
3. Continue to use the HSPA mixed review worksheets.

New Jersey Core Content Curriculum Standards Addressed:

- 4.1: B4
- 4.3: D1
- 4.5: B4, D4, F1