

## Pre-Formatted Reports: Benchmark Test Item Analysis - New Format

### Data Selections

**Institution(s):** All School Types, All Schools  
**Benchmark Administration:** 09/03/14, 2014-2015 Baseline MS Math I  
**Trend Profile:** 2014-2015  
**Subject:** Mathematics  
**Test Focus:** Mathematics  
**Test Level:** 08  
**Test Category:** District Benchmark  
**Grade:** 08  
**Enrollment:** Total for 2014-2015

Number of questions: 30  
 Number of test-taking students: 524

### Student Responses

Question - Type	Correct		Incorrect	Most Common Mistake		Point Value	Points Achieved / Possible	P-Value / Item Mean	Discrimination
	Rate	Value	Total Rate	Rate	Value				
1 - Multiple Choice	84%	C	16%	8%	B	1	439 / 524	0.74	0.39
2 - Multiple Choice	70%	A	30%	19%	D	1	367 / 524	0.62	0.39
3 - Multiple Choice	48%	A	52%	31%	B	1	252 / 524	0.45	0.20
4 - Multiple Choice	54%	B	46%	24%	A	1	285 / 524	0.46	0.42
5 - Multiple Choice	43%	B	57%	19%	C	1	225 / 524	0.37	0.44
6 - Multiple Choice	55%	A	45%	23%	C	1	290 / 524	0.50	0.28
7 - Multiple Choice	35%	B	65%	31%	D	1	185 / 524	0.27	0.02
8 - Multiple Choice	23%	A	77%	53%	D	1	118 / 524	0.15	0.28
9 - Multiple Choice	77%	C	23%	10%	A	1	403 / 524	0.68	0.48
10 - Multiple Choice	67%	D	33%	16%	B	1	352 / 524	0.58	0.46
11 - Multiple Choice	49%	B	51%	24%	C	1	259 / 524	0.43	0.33
12 - Multiple Choice	64%	A	36%	14%	B	1	337 / 524	0.59	0.38
13 - Multiple Choice	63%	D	37%	13%	C	1	331 / 524	0.57	0.39
14 - Multiple Choice	79%	C	21%	10%	D	1	414 / 524	0.77	0.34
15 - Multiple Choice	46%	C	54%	20%	B	1	239 / 524	0.43	0.33
16 - Multiple Choice	46%	B	54%	23%	C	1	239 / 524	0.41	0.26
17 - Multiple Choice	65%	C	35%	19%	A	1	343 / 524	0.52	0.44
18 - Multiple Choice	60%	B	40%	24%	A	1	314 / 524	0.61	0.39
19 - Multiple Choice	85%	C	15%	10%	A	1	444 / 524	0.77	0.40
20 - Multiple Choice	69%	A	31%	15%	B	1	360 / 524	0.59	0.47

# NORTH CAROLINA DEPARTMENT OF PUBLIC INSTRUCTION

Preformatted Reports

21 - Multiple Choice	29%	C	71%	27%	B	1	151 / 524	0.26	0.15
22 - Multiple Choice	70%	C	30%	13%	A	1	369 / 524	0.59	0.34
23 - Multiple Choice	39%	C	61%	43%	D	1	202 / 524	0.46	0.01
24 - Multiple Choice	15%	C	85%	35%	D	1	77 / 524	0.19	0.00
25 - Multiple Choice	10%	D	90%	65%	B	1	52 / 524	0.13	0.00
26 - Multiple Choice	88%	D	12%	6%	B	1	459 / 524	0.82	0.34
27 - Multiple Choice	40%	A	60%	24%	C	1	207 / 524	0.32	0.32
28 - Multiple Choice	62%	C	38%	32%	B	1	324 / 524	0.60	0.18
29 - Multiple Choice	45%	B	55%	20%	A	1	238 / 524	0.42	0.24
30 - Multiple Choice	42%	D	58%	32%	A	1	221 / 524	0.32	0.33
<b>Summary</b>	<b>54%</b>		<b>46%</b>				<b>283 / 524</b>		

P-value represents an item's difficulty as evaluated by dividing the total number of correct responses by the total number of students tested. P-value is calculated for true/false, multiple choice, gridded or hot spot-single response items.

Item Mean is the average score for student responses to an open response question or to a multi-part question. Item Mean is calculated for inline response, matching or hot spot-multiple selections items.

Discrimination or Item Total Score Correlation is the correlation between the question score and the overall test score and indicates the extent to which success on an item corresponds to success on the test.

## Standards Alignment to Common Core State Standards

Question	ID	Standard Description
<b>1 - Multiple Choice</b>	<b>CCSS.Math.Content.8.NS.A.2</b>	Use rational approximations of irrational numbers to compare the size of irrational numbers, locate them approximately on a number line diagram, and estimate the value of expressions (e.g., $\pi^2$ ). For example, by truncating the decimal expansion of the square root of 2, show that the square root of 2 is between 1 and 2, then between 1.4 and 1.5, and explain how to continue on to get better approximations.
<b>2 - Multiple Choice</b>	<b>CCSS.Math.Content.8.NS.A.1</b>	Know that numbers that are not rational are called irrational. Understand informally that every number has a decimal expansion; for rational numbers show that the decimal expansion repeats eventually, and convert a decimal expansion which repeats eventually into a rational number.
<b>3 - Multiple Choice</b>	<b>CCSS.Math.Content.8.EE.A.1</b>	Know and apply the properties of integer exponents to generate equivalent numerical expressions. For example, $3^2 \times (3 \text{ to the } -5 \text{ power}) = (3 \text{ to the } -3 \text{ power}) = 1/3^3 = 1/27$ .
<b>4 - Multiple Choice</b>	<b>CCSS.Math.Content.8.EE.A.1</b>	Know and apply the properties of integer exponents to generate equivalent numerical expressions. For example, $3^2 \times (3 \text{ to the } -5 \text{ power}) = (3 \text{ to the } -3 \text{ power}) = 1/3^3 = 1/27$ .
<b>5 - Multiple Choice</b>	<b>CCSS.Math.Content.8.EE.C.7</b>	Solve linear equations in one variable.
<b>6 - Multiple Choice</b>	<b>CCSS.Math.Content.8.F.B.4</b>	Construct a function to model a linear relationship between two quantities. Determine the rate of change and initial value of the function from a description of a relationship or from two (x, y) values, including reading these from a table or from a graph. Interpret the rate of change and initial value of a linear function in terms of the situation it models, and in terms of its graph or a table of values.
<b>7 - Multiple Choice</b>	<b>CCSS.Math.Content.8.F.B.4</b>	Construct a function to model a linear relationship between two quantities. Determine the rate of change and initial value of the function from a description of a relationship or from two (x, y) values, including reading these from a table or from a graph. Interpret the rate of change

and initial value of a linear function in terms of the situation it models, and in terms of its graph or a table of values.

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- 8 - Multiple Choice CCSS.Math.Content.8.F.B.4** Construct a function to model a linear relationship between two quantities. Determine the rate of change and initial value of the function from a description of a relationship or from two (x, y) values, including reading these from a table or from a graph. Interpret the rate of change and initial value of a linear function in terms of the situation it models, and in terms of its graph or a table of values.
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- 9 - Multiple Choice CCSS.Math.Content.7.NS.A.3** Solve real-world and mathematical problems involving the four operations with rational numbers. Computations with rational numbers extend the rules for manipulating fractions to complex fractions.
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- 10 - Multiple Choice CCSS.Math.Content.8.NS.A.2** Use rational approximations of irrational numbers to compare the size of irrational numbers, locate them approximately on a number line diagram, and estimate the value of expressions (e.g.,  $\pi^2$ ). For example, by truncating the decimal expansion of the square root of 2, show that the square root of 2 is between 1 and 2, then between 1.4 and 1.5, and explain how to continue on to get better approximations.
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- 11 - Multiple Choice CCSS.Math.Content.8.G.A.3** Describe the effect of dilations, translations, rotations, and reflections on two-dimensional figures using coordinates.
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- 12 - Multiple Choice CCSS.Math.Content.8.EE.A.4** Perform operations with numbers expressed in scientific notation, including problems where both decimal and scientific notation are used. Use scientific notation and choose units of appropriate size for measurements of very large or very small quantities (e.g., use millimeters per year for seafloor spreading). Interpret scientific notation that has been generated by technology.
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- 13 - Multiple Choice CCSS.Math.Content.8.EE.C.7** Solve linear equations in one variable.
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- 14 - Multiple Choice CCSS.Math.Content.8.F.B.4** Construct a function to model a linear relationship between two quantities. Determine the rate of change and initial value of the function from a description of a relationship or from two (x, y) values, including reading these from a table or from a graph. Interpret the rate of change and initial value of a linear function in terms of the situation it models, and in terms of its graph or a table of values.
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- 15 - Multiple Choice CCSS.Math.Content.HSA-REI.D.10** Understand that the graph of an equation in two variables is the set of all its solutions plotted in the coordinate plane, often forming a curve (which could be a line).
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- 16 - Multiple Choice CCSS.Math.Content.8.G.C.9** Know the formulas for the volumes of cones, cylinders, and spheres and use them to solve real-world and mathematical problems.
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- 17 - Multiple Choice CCSS.Math.Content.8.EE.A.2** Use square root and cube root symbols to represent solutions to equations of the form  $x^2 = p$  and  $x^3 = p$ , where p is a positive rational number. Evaluate square roots of small perfect squares and cube roots of small perfect cubes. Know that the square root of 2 is irrational.
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- 18 - Multiple Choice CCSS.Math.Content.8.F.B.4** Construct a function to model a linear relationship between two quantities. Determine the rate of change and initial value of the function from a description of a relationship or from two (x, y) values, including reading these from a table or from a graph. Interpret the rate of change and initial value of a linear function in terms of the situation it models, and in terms of its graph or a table of values.
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- 19 - Multiple Choice CCSS.Math.Content.8.EE.C.7** Solve linear equations in one variable.
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- 20 - Multiple Choice CCSS.Math.Content.8.F.B.4** Construct a function to model a linear relationship between two quantities. Determine the rate of change and initial value of the function from a description of a relationship or from two (x, y) values, including reading these from a table or from a graph. Interpret the rate of change and initial value of a linear function in terms of the situation it models, and in terms of its graph or a table of values.
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- 21 - Multiple Choice CCSS.Math.Content.8.G.C.9** Know the formulas for the volumes of cones, cylinders, and spheres and use them to solve real-world and mathematical problems.
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- 22 - Multiple Choice CCSS.Math.Content.8.EE.B.5** Graph proportional relationships, interpreting the unit rate as the slope of the graph. Compare two different proportional relationships represented

in different ways. For example, compare a distance-time graph to a distance-time equation to determine which of two moving objects has greater speed.

**23 - Multiple Choice CCSS.Math.Content.8.F.A.1** Understand that a function is a rule that assigns to each input exactly one output. The graph of a function is the set of ordered pairs consisting of an input and the corresponding output. Function notation is not required in Grade 8.

**24 - Multiple Choice CCSS.Math.Content.8.F.A.1** Understand that a function is a rule that assigns to each input exactly one output. The graph of a function is the set of ordered pairs consisting of an input and the corresponding output. Function notation is not required in Grade 8.

**25 - Multiple Choice CCSS.Math.Content.8.F.B.4** Construct a function to model a linear relationship between two quantities. Determine the rate of change and initial value of the function from a description of a relationship or from two (x, y) values, including reading these from a table or from a graph. Interpret the rate of change and initial value of a linear function in terms of the situation it models, and in terms of its graph or a table of values.

**26 - Multiple Choice CCSS.Math.Content.8.F.B.4** Construct a function to model a linear relationship between two quantities. Determine the rate of change and initial value of the function from a description of a relationship or from two (x, y) values, including reading these from a table or from a graph. Interpret the rate of change and initial value of a linear function in terms of the situation it models, and in terms of its graph or a table of values.

**27 - Multiple Choice CCSS.Math.Content.8.F.A.2** Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). For example, given a linear function represented by a table of values and a linear function represented by an algebraic expression, determine which function has the greater rate of change.

**28 - Multiple Choice CCSS.Math.Content.HSA-SSE.A.1** Interpret expressions that represent a quantity in terms of its context.

**29 - Multiple Choice CCSS.Math.Content.7.EE.B.4** Use variables to represent quantities in a real-world or mathematical problem, and construct simple equations and inequalities to solve problems by reasoning about the quantities.

**30 - Multiple Choice CCSS.Math.Content.7.EE.A.1** Apply properties of operations as strategies to add, subtract, factor, and expand linear expressions with rational coefficients.