

# TNReady Grades 6–8 Mathematics 2016–17 School Year

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## Overview of Grades 6–8 Mathematics Testing Structure

As in the past, each year the state assessment includes both operational and field test items. The testing structure outlined below reflects both the number of operational assessment items and the number of field test assessment items.

For scheduling purposes, subparts can be combined.



<b>Subpart 1 (No Calculator)</b>	<b>Subpart 2 (Calculator)</b>	<b>Subpart 3 (Calculator)</b>
40 Minutes • 16–20 Items	30 Minutes • 10–14 Items	55 minutes • 11–18 Items • 2 Integrated Items*



For scheduling purposes, subparts can be combined.

*\*Integrated Items: 4–6 point questions that ask students to assimilate information from multiple grade-level domains. They may require background knowledge from previous grades. For 2016–17, both integrated items are field test items.*

## Grades 6–8 Mathematics Blueprints

The blueprints reflect only operational assessment items.

In grades 3–8 mathematics, approximately 70 percent of the assessment items gauge student mastery on major work of the grade. Approximately 30 percent of the items gauge student mastery on supporting and additional work.

Grade 6			
	# of Items	# of Score Points	% of Test
<b>Number Relationships</b> <ul style="list-style-type: none"> <li>**6.NS.A–Apply and extend previous understandings of multiplication and division to divide fractions by fractions.</li> <li>6.NS.B–Compute fluently with multi-digit numbers and find common factors and multiples.</li> <li>**6.NS.C–Apply and extend previous understandings of numbers to the system of rational numbers.</li> </ul>	14–19	17–21	34–35
<b>Ratios and Rates</b> <ul style="list-style-type: none"> <li>**6.RP.A–Understand ratio concepts and use ratio reasoning to solve problems.</li> </ul>	4–6	5–8	10–13
<b>Expressions and Equations</b> <ul style="list-style-type: none"> <li>**6.EE.A–Apply and extend previous understandings of arithmetic to algebraic expressions.</li> <li>**6.EE.B–Reason about and solve one-variable equations and inequalities.</li> <li>**6.EE.C–Represent and analyze quantitative relationships between dependent and independent variables.</li> </ul>	13–17	15–19	30–32
<b>Geometry and Data</b> <ul style="list-style-type: none"> <li>6.G.A–Solve real-world and mathematical problems involving area, surface area, and volume.</li> <li>6.SP.A–Develop understanding of statistical variability.</li> <li>6.SP.B–Summarize and describe distributions.</li> </ul>	6–10	8–12	16–20
<b>Total</b>	37–52	*50–60	100%

*\*All assessments must have a minimum of 50 score points.*

*\*\*Clusters with asterisks indicate major content of the grade.*

## Grade 7

	# of items	# of Score Points	% of Test
<b>Number Relationships</b> <ul style="list-style-type: none"> <li>**7.NS.A–Apply and extend previous understandings of operations with fractions to add, subtract, multiply, and divide rational numbers.</li> </ul>	7–9	7–11	14–18
<b>Proportional Reasoning</b> <ul style="list-style-type: none"> <li>**7.RP.A–Analyze proportional relationships and use them to solve real-world and mathematical problems.</li> </ul>	6–8	6–10	12–17
<b>Expressions and Equations</b> <ul style="list-style-type: none"> <li>**7.EE.A–Use properties of operations to generate equivalent expressions.</li> <li>**7.EE.B–Solve real-life and mathematical problems using numerical and algebraic expressions and equations.</li> </ul>	14–18	16–20	32–34
<b>Geometry and Data</b> <ul style="list-style-type: none"> <li>7.G.A–Draw, construct, and describe geometrical figures and describe the relationships between them.</li> <li>7.G.B–Solve real-life and mathematical problems involving angle measure, area, surface area, and volume.</li> <li>7.SP.A–Use random sampling to draw inferences about a population.</li> <li>7.SP.B–Draw informal comparative inferences about two populations.</li> <li>7.SP.C–Investigate chance processes and develop, use, and evaluate probability models</li> </ul>	12–17	15–19	30–32
<b>Total</b>	39–52	*50–60	100

*\*All assessments must have a minimum of 50 score points.*

*\*\*Clusters with asterisks indicate major content of the grade.*

**Grade 8**

	<b># of Items</b>	<b># of Score Points</b>	<b>% of Test</b>
<b>Number Relationships</b> 8.NS.A–Know that there are numbers that are not rational, and approximate them by rational numbers **8.EE.A–Work with radicals and integer exponents.	9–11	9–13	18–22
<b>Functions</b> **8.F.A–Define, evaluate, and compare functions **8.F.B–Use functions to model relationships between quantities.	7–10	8–12	16–20
<b>Expressions and Equations</b> **8.EE.B–Understand the connections between proportional relationships, lines, and linear equations. **8.EE.C–Analyze and solve linear equations and pairs of simultaneous linear equations.	8–11	9–13	18–22
<b>Geometry and Data</b> **8.G.A–Understand congruence and similarity using physical models, transparencies, or geometry software. **8.G.B–Understand and apply the Pythagorean Theorem. 8.G.C–Solve real-world and mathematical problems involving volume of cylinders, cones, and spheres. 8.SP.A–Investigate patterns of association in bivariate data.	14–20	18–22	36–37
<b>Totals</b>	38–52	*50–60	100

*\*All assessments must have a minimum of 50 score points.*

*\*\*Clusters with asterisks indicate major content of the grade.*

# TNReady Grades 6-8 Mathematics Calculator Policy

## Central Beliefs

The TNReady calculator policy is based on two central beliefs:

- 1) Calculators are important tools and, in order to be ready for career and college, students need to understand how to use calculators effectively.
- 2) In order to demonstrate mastery of the mathematics standards, students must demonstrate many skills without reliance on calculators.

**Therefore, at all grade levels and in all courses, the math assessment will include both calculator permitted subparts and calculator prohibited subparts.**

- There will be one calculator prohibited subpart and two calculator permitted subparts at all grade levels.
- Information on the types of questions on the calculator prohibited section of TNReady can be found ([here](#)).

## Rationale

Calculator functionalities should align with the mathematics in each grade band. In grades 6–8 mathematics, our state standards focus on **solidifying** a student’s computational fluency with rational numbers. Students are also **developing** an understanding of linear graphing. Students should not have calculator functionalities available to them for concepts that are in the developmental stage.

As stated within our central beliefs, students should have the opportunity to interact with technology and the opportunity to demonstrate critical thinking and problem solving with the aid of a calculator. However, in order to provide an equitable assessment experience for all Tennessee students, the type of calculator used by students should be consistent in functionality. As linear graphing is in the developmental phase over this grade band, students do not need a full graphing capabilities—they need to be able to demonstrate their conceptual understanding of linear graphing. Thus, sixth through eighth grade students will be allowed a **four-function or scientific** calculator, which does not include any of the prohibited functionalities on the calculator permitted subparts, such as linear graphing.

## Test Administration Guidelines

- It is the responsibility of the test administrator to ensure the regulations outlined in this policy pertaining to calculator use are followed.
- All memory and user-entered programs and documents must be cleared or removed before and after the test.
- A student may use any grade-band specific permitted calculator on the calculator permitted subparts.
- Students should have access to no more than one handheld calculator device for calculator-permitted subparts.
- As we transition to online in future years, students will have access to practice with the same calculator functionalities that will be available on the operational assessment on both the item sampler and the practice tests.

## **Handheld Calculator Types**

For grades 6–8, students may use any four function or scientific calculator, which does not include any of the prohibited functionalities. *Please note: This is not an exhaustive list of calculator types, and students should be familiar with particular functions at the appropriate grade level.*

### **Examples of permitted calculators:**

- TI-108
- Casio HS 4 Basic
- Sharp ELSI Mate EL-2405A
- TI-15
- TI-30
- Casio FX260
- Sharp EL344RB

### **Examples of permitted functionalities**

- Square root ( $\sqrt{\quad}$ )
  - %
  - Fraction manipulation
  - Square key ( $x^2$  or  $x^y$ )
  - Pi ( $\rho$ )
  - Trigonometric functions (sine, cosine, tangent)
- 

### **Examples of prohibited calculators:**

- TI-84 plus family
- TI-NSpire (non-CAS) and TI-NSpire-CX (non-CAS)
- TI-89
- TI-NSpire (CAS version)
- HP-40G
- Casio CFX-9970

### **Calculator functionalities that are prohibited:**

- Graphing capability
- Data entry
- Matrices
- Regression
- Any calculator with CAS (computer algebra system) capabilities (including any programs or applications)
- Wireless communication capability
- QWERTY keyboard
- Cell phones, tablets, iPads, etc.

## Grades 6–8 Mathematics Reference Sheets

The math assessment will allow reference sheets for all students in grades five through high school. The reference sheets are designed to match the intent of our current state standards in math. Below are the math reference sheets for grades 6–8.

### Math Reference Sheet, Grade 6

1 inch = 2.54 centimeters

1 meter = 39.37 inches

1 mile = 5,280 feet

1 mile = 1,760 yards

1 mile = 1.609 kilometers

1 kilometer = 0.62 mile

1 pound = 16 ounces

1 pound = 0.454 kilograms

1 kilogram = 2.2 pounds

1 ton = 2000 pounds

1 cup = 8 fluid ounces

1 pint = 2 cups

1 quart = 2 pints

1 gallon = 4 quarts

1 gallon = 3.785 liters

1 liter = 0.264 gallons

1 liter = 1000 cubic centimeters

### Math Reference Sheet, Grade 7

1 inch = 2.54 centimeters

1 meter = 39.37 inches

1 mile = 5,280 feet

1 mile = 1,760 yards

1 mile = 1.609 kilometers

1 kilometer = 0.62 mile

1 pound = 16 ounces

1 pound = 0.454 kilograms

1 kilogram = 2.2 pounds

1 ton = 2000 pounds

1 cup = 8 fluid ounces

1 pint = 2 cups

1 quart = 2 pints

1 gallon = 4 quarts

1 gallon = 3.785 liters

1 liter = 0.264 gallons

1 liter = 1000 cubic centimeters

### Math Reference Sheet, Grade 8

1 inch = 2.54 centimeters

1 meter = 39.37 inches

1 mile = 5,280 feet

1 mile = 1,760 yards

1 mile = 1.609 kilometers

1 kilometer = 0.62 mile

1 pound = 16 ounces

1 pound = 0.454 kilograms

1 kilogram = 2.2 pounds

1 ton = 2,000 pounds

1 cup = 8 fluid ounces

1 pint = 2 cups

1 quart = 2 pints

1 gallon = 4 quarts

1 gallon = 3.785 liters

1 liter = 0.264 gallons

1 liter = 1000 cubic centimeters

Pythagorean Theorem  $a^2 + b^2 = c^2$