# 

# Test Blueprint Algebra I 2016 Mathematics Standards of Learning

**This test blueprint will be effective with the administration of the spring 2019 Mathematics Standards of Learning (SOL) tests.**

**Notice to Reader**

In accordance with the requirements of the Civil Rights Act and other federal and state laws and regulations, this document has been reviewed to ensure that it does not reflect stereotypes based on race, color, national origin, sex, age, or disability.

The Virginia Department of Education does not discriminate on the basis of race, sex, color, national origin, religion, sexual orientation, gender identity, age, political affiliation, or against otherwise qualified persons with disabilities in employment or provisions of service.

Copyright ©2017 by the Commonwealth of Virginia, Department of Education, P.O. Box 2120, Richmond, Virginia 23218-2120. All rights reserved. Except as permitted by law, this material may not be reproduced or used in any form or by any means, electronic or mechanical, including photocopying or recording, or by any information storage or retrieval system, without written permission from the copyright owner. Commonwealth of Virginia public school educators may reproduce any portion of this test blueprint for noncommercial educational purposes without requesting permission. All others should direct their written requests to the Virginia Department of Education, Division of Student Assessment and School Improvement, at the above address or by email to [Student\_Assessment@doe.virginia.gov](mailto:Student_Assessment@doe.virginia.gov).

**Algebra I**

**Standards of Learning**

**Test Blueprint**

## TABLE OF CONTENTS

General Test Information………………………………………………………..1

Defines common terms

Test Blueprint Summary Table………………………………………………….2

Organizes the SOL and the number of items assessed

Expanded Test Blueprint……...…………………………………………………3

Full text of each SOL as organized for the test

## General Test Information

### Test Blueprint

Much like the blueprint for a building, a test blueprint serves as a guide for test construction. The blueprint indicates the content areas that will be addressed by the test and the number of items that will be included by content area and for the test as a whole. There is a blueprint for each test (e.g., grade 3 reading, grade 5 mathematics, grade 8 science, Virginia and United States History).

### Reporting Categories

Each test covers a number of Standards of Learning (SOL). In the test blueprint, the SOL are grouped into categories that address related content and skills. These categories are labeled as reporting categories*.* For example, a reporting category for the Algebra I Standards of Learning test is *Equations and Inequalities*. Each of the SOL in this reporting category addresses the solution or application of equations or inequalities. When the results of the SOL tests are reported, the scores will be presented for each reporting category and as a total test score.

### Assignment of Standards of Learning to Reporting Category

In the Algebra I SOL test, each SOL is assigned to only one reporting category. For example, SOL A.2a-c is assigned to “Expressions and Operations.”

### Coverage of Standards of Learning

Due to the large number of SOL in each grade level content area, *every* Standard of Learning will not be assessed on every version (form) of an SOL test. By necessity, to keep the length of a test reasonable, each version will sample from the SOL within a reporting category. Every SOL in the blueprint will be tested within a three year period, and *all of these* SOL are eligible for inclusion on each version of an SOL test.

### Use of the Curriculum Framework

The Algebra I Standards of Learning, amplified by the Curriculum Framework, define the essential understandings, knowledge, and skills that are measured by the Standards of Learning tests. The Curriculum Framework asks essential questions, identifies essential understandings, defines essential content knowledge, and describes essential skills students need to master.

## Algebra I Test Blueprint Summary Table

|  |  |  |
| --- | --- | --- |
| **Reporting Category** | **Algebra I SOL** | **Number of Items** |
| **Expressions and Operations** | **A.1a-b**  **A.2a-c**  **A.3a-c** | **11** |
| **Equations and Inequalities** | **A.4a-e**  **A.5a-d**  **A.6a-c** | **18** |
| **Functions and Statistics** | **A.7a-f**  **A.8**  **A.9** | **16** |
| **Number of Operational Items** | | **45** |
| **Number of Field-Test Items\*** | | **10** |
| **Total Number of Items on Test** | | **55** |

\*Field-test items are being tried out with students for potential use on subsequent tests and will not be used to compute students’ scores on the test.

## Algebra I Expanded Test Blueprint

### Reporting Category: Expressions and Operations Number of Items: 11 Standards of Learning:

A.1 The student will

1. represent verbal quantitative situations algebraically; and
2. evaluate algebraic expressions for given replacement values of the variables.

A.2 The student will perform operations on polynomials, including

a) applying the laws of exponents to perform operations on expressions;

1. adding, subtracting, multiplying, and dividing polynomials; and

c) factoring completely first- and second-degree binomials and trinomials in one

variable.

A.3 The student will simplify

* 1. square roots of whole numbers and monomial algebraic expressions;
  2. cube roots of integers; and
  3. numerical expressions containing square or cube roots.

### Reporting Category: Equations and Inequalities Number of Items: 18 Standards of Learning:

A.4 The student will solve

* 1. multistep linear equations in one variable algebraically;
  2. quadratic equations in one variable algebraically;
  3. literal equations for a specified variable;
  4. systems of two linear equations in two variables algebraically and graphically; and

1. practical problems involving equations and systems of equations.

A.5 The student will

* 1. solve multistep linear inequalities in one variable algebraically and represent the solution graphically;

1. represent the solution of linear inequalities in two variables graphically;
2. solve practical problems involving inequalities; and
3. represent the solution to a system of inequalities graphically.

A.6 The student will

a) determine the slope of a line when given an equation of the line, the graph of the line, or two points on the line;

1. write the equation of a line when given the graph of the line, two points on the line, or the slope and a point on the line; and
2. graph linear equations in two variables.

### Reporting Category: Functions and Statistics Number of Items: 16 Standards of Learning:

A.7 The student will investigate and analyze linear and quadratic function families and their characteristics both algebraically and graphically, including

a) determining whether a relation is a function;

1. domain and range;

c) zeros;

d) intercepts;

e) values of a function for elements in its domain; and

f) connections between and among multiple representations of functions using verbal descriptions, tables, equations, and graphs.

A.8 The student, given a data set or practical situation, will analyze a relation to determine whether a direct or inverse variation exists, and represent a direct variation algebraically and graphically and an inverse variation algebraically.

A.9 The student will collect and analyze data, determine the equation of the curve of best fit in order to make predictions, and solve practical problems, using mathematical models of linear and quadratic functions.