2017-2018 WCSD Algebra 1 Program Evaluation Rubric

Evaluator Number

8

Program Number

2

Name of Text

Glencoe Algebra 1

Publisher

McGraw Hill Education

Rate This Text Overall

- [ ] High
- [x] Mid
- [ ] Low

Focus: Evaluate the table of contents and any pacing guides. Do not stop there; also evaluate units, chapters, and lessons. (Both student and teacher materials)

Interpret the structure of expressions

HSA.SSE.A.1 Interpret expressions that represent a quantity in terms of its context.*

HSA.SSE.A.1.a Interpret parts of an expression, such as terms, factors, and coefficients.

HSA.SSE.A.2 Use the structure of an expression to identify ways to rewrite it.

Write expression in equivalent forms to solve problems

HSA.SSE.B.3 Choose and produce an equivalent form of an expression to reveal and explain properties of the quantity represented by the expression.*

HSA.SSE.B.3.a Factor a quadratic expression to reveal the zeros of the function it defines.

HSA.SSE.B.3.b Complete the square in a quadratic expression to reveal the maximum or minimum value of the function it defines.

Create equations that describe numbers or relationships

HSA.CED.A.1 Create equations and inequalities in one variable and use them to solve problems. Include equations arising from linear and quadratic functions and simple rational and exponential functions.

HSA.CED.A.2 Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.

HSA.CED.A.3 Represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions as viable or nonviable options in a modeling context. For example, represent inequalities describing nutritional and cost constraints on combinations of different foods.

HSA.CED.A.4 Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations. For example, rearrange Ohm's law (V = IR) to highlight resistance R.

Understand solving equations as a process of reasoning and explain the reasoning

HSA.REI.A.1 Explain each step in solving a simple equation as following from the equality of numbers asserted at the previous step, starting from the assumption that the original equation has a solution. Construct a viable argument to justify a solution method.

Solve equations and inequalities in one variable

HSA.REI.B.3 Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters.

HSA.REI.B.4 Solve quadratic equations in one variable.

HSA.REI.B.4.a Use the method of completing the square to transform any quadratic equation in x into an equation of the form 〖(x-p)〗^2= q that has the same solutions. Derive the quadratic formula from this form.

HSA.REI.B.4.b Solve quadratic equations by inspection (e.g., for x^2=49), taking square roots, completing the square, the quadratic formula and factoring, as appropriate to the initial form of the equation.

A.REI.11 Explain why the x-coordinates of the points where the graphs of the equations y=f(x) and y=g(x) intersect are the solution of the equation f(x)=g(x).

Solve systems of equations

HSA.REI.C.6 Solve systems of linear equations exactly and approximately (e.g., with graphs), focusing on pairs of linear equations in two variables.

HSF.IF.B.5 Relate the domain of a function to its graph and, where applicable, to the quantitative relationship it describes. For example, if the function h(n) gives the number of person-hours it takes to assemble n engines in a factory, then the positive integers would be an appropriate domain for the function.*

Interpret functions that arise in application in terms of the context.

HSF.IF.B.6 Calculate and interpret the average rate of change of a function (presented symbolically or as a table) over a specified interval. Estimate the rate of change from a graph.*

Analyze functions using different representations

HSF.IF.C.7 Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases.*
HSF.IF.C.7.a Graph linear and quadratic functions and show intercepts, maxima, and minima.
HSF.IF.C.8 Write a function defined by an expression in different but equivalent forms to reveal and explain different properties of the function
HSF.IF.C.8.a Use the process of factoring and completing the square in a quadratic function to show zeros, extreme values, and symmetry of the graph, and interpret these in terms of a context.
HSF.IF.C.8.b Use the properties of exponents to interpret expressions for exponential functions. For example, identify percent rate of change in functions such as $y = (1.02)^t$, $y = (0.97)^t$, $y = (1.01)12^t$, $y = (1.2)^t/10$, and classify them as representing exponential growth or decay.

Build a function that models a relationship between two quantities

HSF.BF.A.1 Write a function that describes a relationship between two quantities.*
HSF.BF.A.1.a Determine an explicit expression, a recursive process, or steps for calculation from a context.
HSF.BF.A.2 Write arithmetic and geometric sequences both recursively and with an explicit formula, use them to model situations, and translate between the two forms.*

Build new functions from existing functions

HSF.BF.B.3 Identify the effect on the graph of replacing f(x) by f(x) + k, k f(x), f(kx), and f(x + k) for specific values of k (both positive and negative); find the value of k given the graphs. Experiment with cases and illustrate an explanation of the effects on the graph using technology. Include recognizing even and odd functions from their graphs and algebraic expressions for them.

Construct and compare linear, quadratic, and exponential models and solve problems

HSF.LE.A.1 Distinguish between situations that can be modeled with linear functions and with exponential functions.
HSF.LE.A.1.a Prove that linear functions grow by equal differences over equal intervals, and that exponential functions grow by equal factors over equal intervals.
HSF.LE.A.1.b Recognize situations in which one quantity changes at a constant rate per unit interval relative to another.
HSF.LE.A.1.c Recognize situations in which a quantity grows or decays by a constant percent rate per unit interval relative to another.
HSF.LE.A.2 Construct linear and exponential functions, including arithmetic and geometric sequences, given a graph, a description of a relationship, or two input-output pairs (include reading these from a table).

Interpret expressions for functions in terms of the situation they model

HSF.LE.B.5 Interpret the parameters in a linear or exponential function in terms of a context.

100% of the standards are in the textbook.
Comments?

Missing graphing f(x)=g(x). Other than that, hits pretty much everything!

- ○ Less than 25%
- ○ Less than 85% but greater than 50%
- ● Less than 100% but greater than 85%
- ○ 100%

Materials: Lessons, chapter/unit assessments, daily routines, and homework assignments

Student work involves significant work with applications/modeling and problems that use algebra skills.
Comments?

There are application problems. However, most of the "lessons"/"examples" are very straight forward: "here's the formula, use it solve this...". Very little discovery.

- ○ Does not occur
- ○ Sometimes occurs
- ● Frequently occurs
- ○ Consistently occurs

There are problems at a level of sophistication appropriate to high school (beyond mere review of previous course standards) that involve the application of knowledge and skills from grades 6-8. Any problems at the level of rigor of middle school standards are appropriately labeled.
Comments?

Uses AL (approaching grade level), OL (on grade level), and BL (beyond grade level) to differentiate. Cool idea!

- ○ Does not occur
- ○ Sometimes occurs
- ○ Frequently occurs
- ○ Consistently occurs

Rigor: Examine the instructional materials, student practice and assessments. Look for evidence of where the standards explicitly require students to understand concepts. Do the assignments that students work on build that understanding? Do assessment tasks reveal whether students understand the mathematics in question?
Comments?

The assessments and homework questions are fairly standard. Some procedural, some application, nothing special. Dislike how the topics are introduced in the examples though; too straight forward!

- ○ Does not occur
- ○ Sometimes occurs
- ● Frequently occurs
- ○ Consistently occurs

Rigor: Do the materials feature high-quality conceptual problems and conceptual discussion questions? Do they provide opportunities for multiple representations?
Comments?

Yes, good variety of homework/assessment questions

- ○ Does not occur
- ○ Sometimes occurs
- ○ Frequently occurs
- ◉ Consistently occurs

Rigor: Are the materials designed so that teachers and students spend sufficient time working with applications, without losing focus on the standards defined for the course? Are there single- and multi-step contextual problems that develop the mathematics of the course, afford opportunities for practice, and engage students in problem solving?
Comments?

There aren't as many in this textbook. Most problems are pretty straight forward. Those problems that do ask for multi-step solutions are too structured.

- ○ Does not occur
- ○ Sometimes occurs
- ◉ Frequently occurs
- ○ Consistently occurs

Rigor: Are the materials designed so that students attain the fluency and procedural skills required? Evaluate the lessons, chapter/unit assessments, daily routines, and homework assignments for evidence in the development of fluency and procedural skill supported by conceptual understanding.
Comments?

Yes: there are many ways students can achieve fluency, between the homework, online homework, "ALEKS" (adaptive online software), and the Interactive Student Guide.

- ○ Does not occur
- ○ Sometimes occurs
- ○ Frequently occurs
- ◉ Consistently occurs

Coherence: Are the materials coherent in their content, do the standards build on each other in a way that is beneficial to the instruction, student practice and assessments?
Comments?

Yes

- ○ Does not occur
- ○ Sometimes occurs
- ○ Frequently occurs
- ◉ Consistently occurs

Mathematical Practices: Are the mathematical practices addressed in such a way to benefit instruction and expectation of students?
Comments?

Yes, there are little "MP" symbols all over the place to denote when the Mathematical Practices are used. Seems a little vague though: "Use the MPs here to solve a problem". Shouldn't you always be using the MPs?

- ○ Does not occur
- ○ Sometimes occurs
- ○ Frequently occurs
- ◉ Consistently occurs

Are the appropriate Algebra 1 statistics standards present in the text?
Comments?

Yes

- ○ Does not occur
- ○ Sometimes occurs
- ○ Frequently occurs
- ◉ Consistently occurs

What supplemental resources are included with the text? Briefly describe the pros and cons.

The main companion website is nothing to write home about. It has a copy of the book (non-interactive which is a shame) as well as supplemental videos for additional help. However, the "ALEKS" website is much better: adaptive learning and testing for students!

Overall comments: this book is very typical. It resembles (no surprise as the same publisher) our current math textbook. There isn't much discovery, it's very straightforward in terms of problems, and it's...fine. Nothing to write home about.