Mathematics Curriculum Guide

Algebra 2 Trig Honors

2017-18

Teaching for Understanding

- **Effective instruction begins with clarity about desired learning outcomes and about evidence that indicates learning has occurred, better known as "beginning with the end in mind." By starting with long-term results and working "backward," effective lesson planning occurs. The "backward planning" stages for a mathematics unit are:**

Stage One – Desired Results

"What are the long-term learning outcomes for my students?"

Teacher Actions:

- Review the Standards, Understandings, Essential Questions, Knowledge and Skills for the unit.
- Develop a deeper understanding of each math skill (*What is there to understand?*).
- Build connections within and between the unit's skills (*How are these understandings connected?*).

Stage Two – Evidence of Learning

"How will I know if my students understand the content?"

Teacher Actions:

- Design formative and summative assessments to inform instruction and gauge student progress towards desired results (Stage One).

Stage Three – Learning Experiences and Instruction

"What learning progression best supports my students? What learning experiences will build deep understanding and achieve my desired results?"

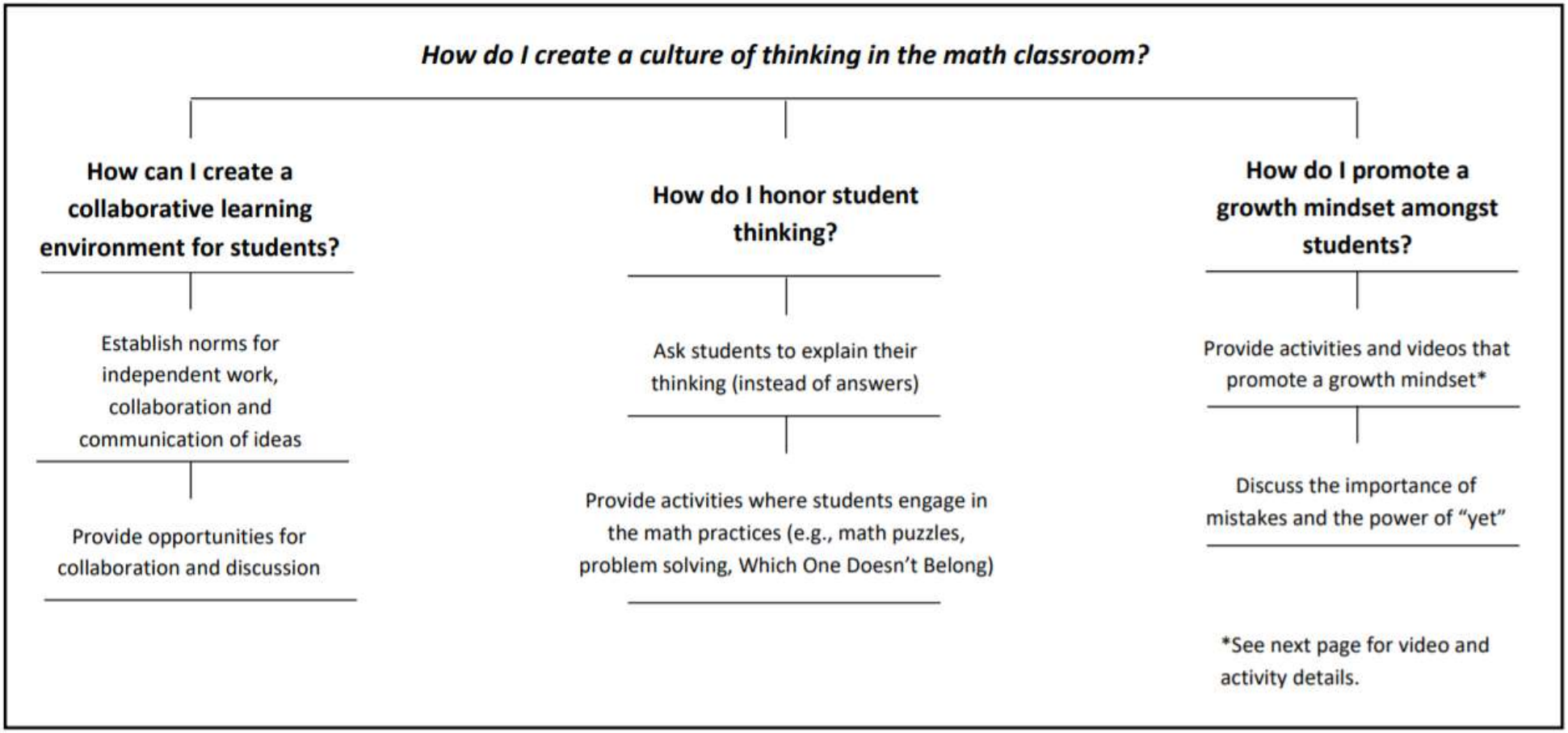
Teacher Actions:

- Determine students' understanding of prerequisite skills.
- With learning goals in mind, plan tasks that build conceptual knowledge, promote meaning making, connect mathematical concepts, and promote the mathematical practices.
- Teach for understanding.

- During the first three weeks of school, teachers will dedicate time during math instruction to create a mathematical mindset. A menu of activities can be selected by teachers to establish a healthy classroom environment, prepare students to engage in inquiry and problem-solving, and promote a positive growth mindset (see pages 3-4).

Create a Culture of Thinking

- **Creating a culture of thinking in the math classroom is a dedicated process that takes place throughout the entire school year. In order to lay the foundation, teachers will spend time during the first three days of school providing students with activities that establish an engaging learning community focused on problem solving, discourse and metacognition.**



Creating a Growth Mindset

Background

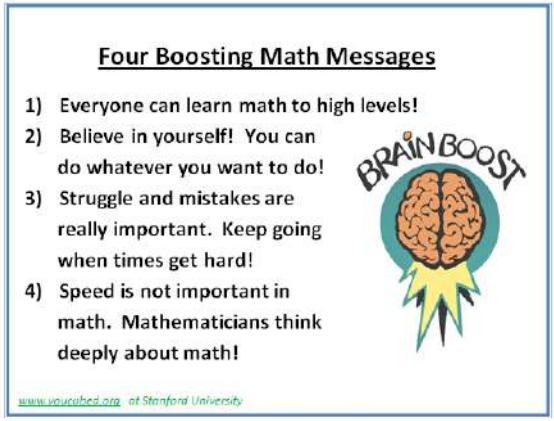
- The way a student reacts to academic challenges is directly related to whether or not the student has a growth mindset. The gap in student performance widens over time between those with a growth mindset and those with a fixed mindset.
- Teachers play a key role in developing growth mindset in students. To create a growth mindset culture, focus on the power of mistakes (download Jo Boaler's "Positive Classroom Norms"). Praise the process, not the person.
- Simply telling students to have a growth mindset can backfire. A scientific explanation about how intelligence works – that the brain can get stronger and smarter with new learning – has been demonstrated to be effective.
- Reiterating the message "just try harder" can also be problematic. A growth mindset isn't about trying harder. Students need to understand why they should put in effort and how to deploy that effort.

Secondary Videos

- Neuroplasticity (2:03) https://www.youtube.com/watch?v=ELpfYCZa87g
- The science behind Growth Mindset (3:04) https://www.youtube.com/watch?v=WtKJrB5rOKs
- Four Boosting Math Messages from Jo and Her Students (8:35) https://www.youcubed.org/students/
- John Legend: Success through effort (2:01) https://www.youtube.com/watch?v=LUtcigWSBsw

Discussion Questions

- How do you feel when you make a mistake? Why?
- How do you think other people see you when you make a mistake?
- Have you ever discovered something new from making a mistake?
- Have you ever felt proud of making a mistake?
- Has a mistake ever made you think more deeply about a problem? (start non-academic and then talk about how the lessons apply to academics)



The Power of "Yet"

- Turn a fixed mindset comment into a growth mindset statement by adding 'yet' to the end of the comment.
- Video: Sesame Street: Janelle Monae – Power of Yet (2:41) https://www.youtube.com/watch?v=XLeUvZvuvAs
- When grading student work, be it formative or summative, create a cut off point for what you would consider mastery. All work that does not meet this expectation is marked NOT YET. When returned to students, explain that they are to revise work and provide guidelines and structure for students to fix their assignments and demonstrate mastery.

Activities

- Design a poster comparing growth and fixed mindsets
- Write growth mindset hashtags and post around the classroom
- Turn the transfer goals into "I will…" statements
- Challenge students with a math puzzle and focus on using growth mindset language (I can't get the answer… yet)
- Answer a "Dear Abby" letter from a student who feels like a failure
- Give each student a piece of paper. Ask them to crumple it up and throw it at the board with the feelings they have when they make a mistake in math. Get them to retrieve the paper, uncrumple it, and color each line with different colors. Tell your students that these lines represent all the synaptic activity that happens when a mistake is made. Explain how they can learn from mistakes. Ask them to keep the paper and stick it into a notebook or folder to look at when they make a mistake. This physical reminder prompts students to use mistakes to strengthen their brain every time they open their notebook.

Topic 1: Equations, Inequalities, Functions, & Graphs (Chapters 1 & 2)

In this unit students will begin with a basic review of solving and graphing liner and absolute value equations and inequalities. Then students will expand their basic understandings and skills related to functions, equations, and graphs. Students will identify different forms of linear equations, determine which form of a linear equation is most easily found with the given information, and convert between various forms of linear equations. Additionally, students will work with absolute value functions to identify the different kinds of transformations that result in changes to graphs and functions. The ultimate goal of this unit is to review basic skills in solving equations and inequalities to prepare for linear systems, as well as expand graphing skills with transformations for absolute value functions to prepare for quadratic functions and equations.

Common Misconceptions:

- **Transformations:** Errors occur when students do not know in what direction to translate a graph. Vertical translations are relatively intuitive: -*k* translates a graph down *k* units while *k* translates the graph up *k* units. However, horizontal translations may confuse students because they are the opposite of what might be expected: -*h* translates the graph right *h* units while *h* translates the graph left *h* units.

Topic 1: Equations, Inequalities, Functions, & Graphs (Chapters 1 & 2)

Transfer Goals

1) Demonstrate perseverance by making sense of a never-before-seen problem, developing a plan, and evaluating a strategy and solution.
2) Effectively communicate orally, in writing, and using models (e.g., concrete, representational, abstract) for a given purpose and audience.
3) Construct viable arguments and critique the reasoning of others using precise mathematical language.

Timeframe: 2 weeks/12 days
Start Date: August 17, 2017
Assessment Dates: Aug. 31 - Sept. 1, 2017

Standards

A-CED 1 Create equations that describe numbers or relationships.

1. Create equations and inequalities in one variable including ones with absolute value and use them to solve problems. Include equations arising from linear and quadratic functions, and simple rational and exponential functions.

A-SSE 1b Interpret the structure of expressions.

b. Interpret complicated expressions by viewing one or more of their parts as a single entity. For example, interpret $P(1+r)^n$ as the product of *P* and a factor not depending on *P*.

F-IF 1 Understand the concept of a functions and use function notation.

1. Understand that a function from one set (called the domain) to another set (called the range) assigns to each element of the domain exactly one element of the range. If *f* is a function and *x* is an element of its domain, then *f(x)* denotes the output of *f* corresponding to the input *x*. The graph of *f* is the graph of the equation *y=f(x)*.

A-CED 2 Create equations that describe numbers or relationships.

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

F-IF 9 Analyze functions using different representations.

9. Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions.

F-BF 3 Analyze functions using different representations.

3. Identify the effect on the graph of replacing f(x) by f(x)+k, 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.

Meaning-Making

Understandings

Students will understand that…

- You can use the properties of equality and inverse operations to solve equations and inequalities.
- Solving an equation that contains a variable means finding all values of the variable that make the equation true (*solutions*). An equation has *no solution* if no value of the variable makes the equation true. For *identities*, all values of the variable make the equation true.
- The solutions of an inequality are the numbers that make it true. You can join two inequalities with the word *and* or the word *or* to form a compound inequality. To solve a compound inequality containing *and*, find all values of the variable that make both inequalities true.
- An absolute value quantity is nonnegative. Since opposites have the same absolute value, an absolute value equation can have two solutions. Absolute value inequalities can be written as compound inequalities without absolute value signs.
- A relation is a set of pairs of input and output values. Relations can be represented with ordered pairs, mapping diagrams, tables of values, and graphs.
- Some quantities are in a relationship where the ratio of corresponding values in constant. The formula $\frac{y}{x} = k$ says that the ratio of all output-input pairs equals the constant , the constant of variation.
- The graph of a linear function is a line. You can represent a linear function with a linear equation.
- Given two points on a line, the slope of the line is the ratio of the change in the y-coordinates to the change in the corresponding x-coordinates. The slope is the coefficient of x when you write a linear equation in slope-intercept form. You write the equation of a line in *point-slope form* when you have a point and the slope or when you have two points. The *standard form* of an equation has both variables and no constants on the left side.
- When two lines have the same slope, they are *parallel.* When two lines have slopes that are negative reciprocals of each other, they are *perpendicular*.
- A parent function is the simplest form of a function in a family of functions. Each member is a transformation of the parent function. Translations shift the graph horizontally, vertically, or both. A reflection flips the graph over a line of symmetry. Vertical stretches and compressions change the shape of the graph by a factor.
- The absolute value function $y = |x|$ is the parent function for the family of functions of the form $y = a|x - h| + k$. The maximum or minimum point of the graph is the vertex of the graph.
- An inequality describes a region of the coordinate plane that has a boundary. To graph an inequality involving two variables, first graph the boundary. Then determine which side of the boundary contains the solutions. Points on a dashed boundary are not solutions. Points on a solid boundary are solutions.

Essential Questions

Students will keep considering…

- How can you interpret your answer(s) when solving equations?
- What does it mean for an equation to have a solution, no solution, or be an identity?
- How are the solutions to a compound inequality joined by *and* different from those joined by *or*?
- What are the characteristics of absolute value equations and inequalities?
- Why can absolute value equations be written as two different linear equations?
- How can you determine whether a relation is a function?
- What does it mean for two variables to be directly related?
- Why does the graph of a direct variation function always pass through the origin?
- How are directionality and slope related in linear functions?
- What generalization can you make about a graph's slope?
- When would you use *slope-intercept form* versus *point-slope form*?
- In what ways are transformations in graphs represented in their related functions?
- What characteristics of the equation result in the V shape opening upward or downward? In a vertical stretch? In a vertical compression? In a vertical translation? In a horizontal translation?
- When determining what inequality a graph represents, what do you need to find?

Acquisition

Knowledge

Students will know…

Vocabulary: equation, solution of an equation, inverse operations, identity, literal equation, compound inequality, absolute value, extraneous solution, relation, domain, range, function, vertical-line test, function rule, function notation, independent variable, dependent variable, direct variation, constant of variation, slope, linear function, linear equation, y-intercept, x-intercept, slope-intercept form, point-slope form, standard form of a linear equation, parallel lines, perpendicular lines, parent function, transformation, translation, reflection, vertical stretch, vertical compression, absolute value function, axis of symmetry, vertex, linear inequality, boundary, half-plane, test point

- **Properties:**
  - Equality: Reflexive, Symmetric, Transitive, Substitution, Addition, Subtraction, Multiplication, Division
  - Inequalities: Transitive, Addition, Subtraction, Multiplication, Division
- Solutions of Absolute Value Statements
- Four Ways to Represent Relations
- **Formulas:** $\frac{y}{x} = k$, slope, slope-intercept form, point-slope form, standard form of a linear equation, absolute value parent function, general form of the absolute value function

Skills

Students will be skilled at and able to do the following…

- Find unknown quantities by relating them to know quantities.
- Solve and write equations.
- Interpret the solutions and graphs of equations and inequalities.
- Solve, graph, and write inequalities and compound inequalities.
- Write and solve equations and inequalities involving absolute value.
- Interpret the results and graphs of absolute value equations and inequalities.
- Identify and graph functions.
- Explain why the vertical-line test can help you identify a function, and why there is no horizontal-line test.
- Write and interpret direct variation equations.
- Graph linear equations and write equations of lines.
- Write an equation of a line given its slope and a point on the line.
- Analyze and describe transformations of functions.
- Graph absolute value functions and two-variable inequalities.

Topic 1: Equations, Inequalities, Functions, & Graphs (Chapters 1 & 2)

Transfer is a student's ability to independently apply understanding in a novel or unfamiliar situation. In mathematics, this requires that students use reasoning and strategy, not merely plug in numbers in a familiar-looking exercise, via a memorized algorithm.

Transfer goals highlight the effective uses of understanding, knowledge, and skills we seek in the long run – that is, what we want students to be able to do when they confront new challenges, both in and outside school, beyond the current lessons and unit. These goals were developed so all students can apply their learning to mathematical or real-world problems while simultaneously engaging in the Standards for Mathematical Practices. In the mathematics classroom, assessment opportunities should reflect student progress towards meeting the transfer goals.

With this in mind, the revised **PUSD transfer goals** are:

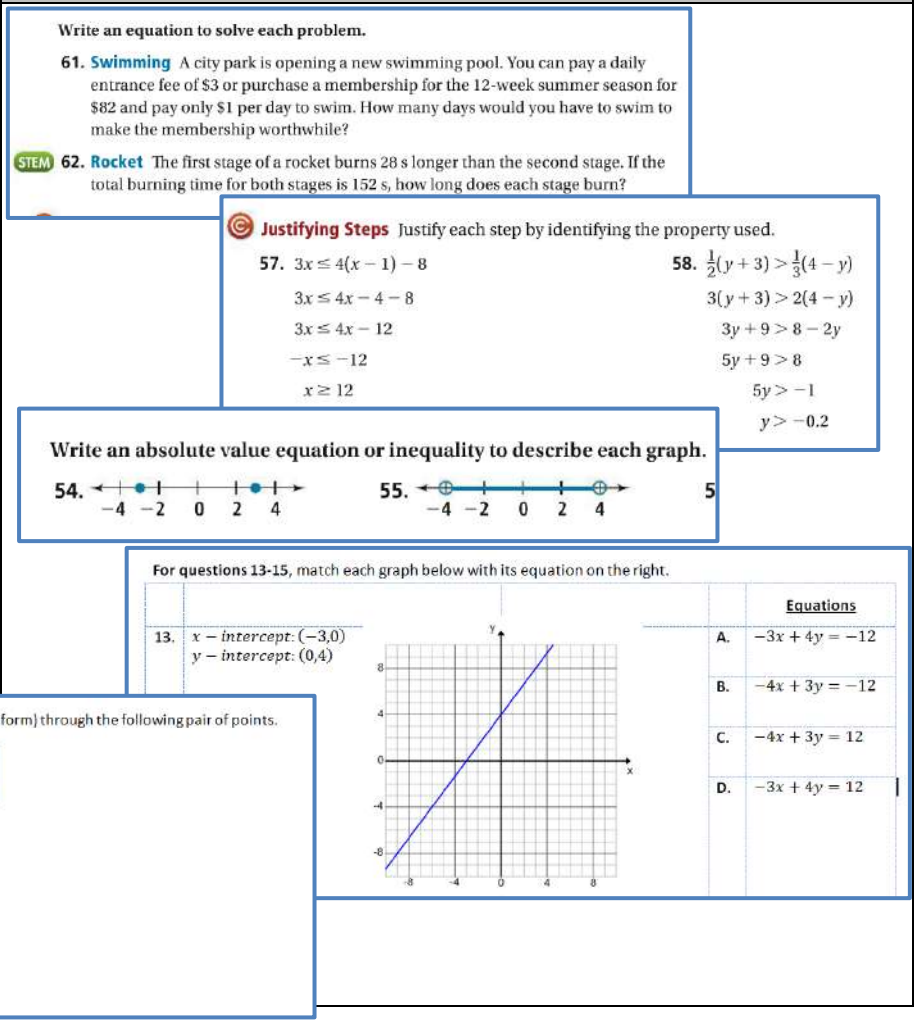
1) **Demonstrate perseverance by making sense of a never-before-seen problem, developing a plan, and evaluating a strategy and solution.**
2) **Effectively communicate orally, in writing, and by using models (e.g., concrete, representational, abstract) for a given purpose and audience.**
3) **Construct viable arguments and critique the reasoning of others using precise mathematical language.**

Multiple measures will be used to evaluate student acquisition, meaning-making and transfer. Formative and summative assessments play an important role in determining the extent to which students achieve the desired results in stage one.

Formative Assessment	Summative Assessment
Aligning Assessment to Stage One	
• What constitutes evidence of understanding for this lesson? • Through what other evidence during the lesson (e.g. response to questions, observations, journals, etc.) will students demonstrate achievement of the desired results? • How will students reflect upon, self-assess, and set goals for their future learning?	• What evidence must be collected and assessed, given the desired results defined in stage one? • What is evidence of understanding (as opposed to recall)? • Through what task(s) will students demonstrate the desired understandings?
Opportunities	
• Discussions and student presentations • Checking for understanding (using response boards) • Ticket out the door, Cornell note summary, and error analysis • *Performance Tasks* within a Unit • Teacher-created assessments/quizzes	• Unit assessments • Teacher-created quizzes and/or mid-unit assessments • *Illustrative Mathematics* tasks (https://www.illustrativemathematics.org/) • Performance tasks

Topic 1: Equations, Inequalities, Functions, & Graphs (Chapters 1 & 2)

The following pages address how a given skill may be assessed. Assessment guidelines, examples and possible question types have been provided to assist teachers in developing formative and summative assessments that reflect the rigor of the standards. *These exact examples cannot be used for instruction or assessment, but can be modified by teachers.*

Unit Skills	SBAC Targets (DOK)	Standards	Examples
• Find unknown quantities by relating them to know quantities. • Solve and write equations. • Interpret the solutions and graphs of equations and inequalities. • Solve, graph, and write inequalities and compound inequalities. • Identify and graph functions. • Graph linear equations and write equations of lines. • Write and interpret direct variation equations. • Write an equation of a line given its slope and a point on the line.	Create equations that describe numbers or relationships. (1,2) Understand the concept of a function and use function notation (1,2) Analyze functions using different representations. (1,2) Identify important quantities in a practical situation and map their relationships (e.g., using diagrams, two-way tables, graphs, flowcharts, or formulas). (1,2,3)	**A-CED 1** Create equations and inequalities in one variable including ones with absolute value and use them to solve problems. Include equations arising from linear and quadratic functions, and simple rational and exponential functions. **A-CED 2** Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales. **A-SSE 1b** Interpret complicated expressions by viewing one or more of their parts as a single entity. For example, interpret $P(1+r)^n$ as the product of *P* and a factor not depending on *P*.	

Topic 1: Equations, Inequalities, Functions, & Graphs (Chapters 1 & 2)

Unit Skills	SBAC Targets (DOK)	Standards	Examples
• Write and solve equations and inequalities involving absolute value. • Interpret the results and graphs of absolute value equations and inequalities. • Identify and graph absolute value functions. • Explain why the vertical-line test can help you identify a function, and why there is no horizontal-line test. • Analyze and describe transformations of functions. • Graph absolute value functions and two-variable inequalities.	Understand the concept of a function and use function notation (1,2) Analyze functions using different representations. (1,2) Identify important quantities in a practical situation and map their relationships (e.g., using diagrams, two-way tables, graphs, flowcharts, or formulas). (1,2,3)	**F-IF 1** Understand that a function from one set (called the domain) to another set (called the range) assigns to each element of the domain exactly one element of the range. If *f* is a function and *x* is an element of its domain, then *f(x)* denotes the output of *f* corresponding to the input *x*. The graph of *f* is the graph of the equation *y=f(x)*. **F-IF 9** Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions. **F-BF 3** Identify the effect on the graph of replacing f(x) by f(x)+k, 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.	**Examples:** • Determine which of the following tables represent a function and explain why. A: (x, f(x)) = (0,1), (1,2), (2,2), (3,4) B: (x, f(x)) = (0,0), (1,2), (1,3), (4,5) *Solution:* Table A represents a function because for each element in the domain there is exactly one element in the range. Table B does not represent a function because when x = 1, there are two values for *f(x)*: 2 and 3. Use the information provided to answer Part A and Part B for question 20. The function *f* is defined as $f(x) = x^2 - 4x$. **20. Part A** Write an expression that defines $f(x + 5)$. Enter your expression in the space provided. **Part B** Describe the transformation that maps the graph of $f(x)$ to $f(x + 5)$. Justify your answer algebraically or by using key features of the graphs. Enter your answer in the space provided. **For questions 16-17**, the following equations are translations. Mark *True* or *False* if the description of the translation from the parent graph matches the equation given. 16. $y = \|x + 7\| - 2$ — Parent Graph & Description of Translation: *$y = \|x\|$, translated 2 units to the left and 7 units down* — True: T — False: F

Topic 1: Equations, Inequalities, Functions, & Graphs (Chapters 1 & 2)

Transfer Goals

1) Demonstrate perseverance by making sense of a never-before-seen problem, developing a plan, and evaluating a strategy and solution.
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3) Construct viable arguments and critique the reasoning of others using precise mathematical language.

Essential Questions:

- How can you interpret your answer(s) when solving equations?
- What does it mean for an equation to have a solution, no solution, or be an identity?
- How are the solutions to a compound inequality joined by *and* different from those joined by *or*?
- What are the characteristics of absolute value equations and inequalities?
- Why can absolute value equations be written as two different linear equations?
- How can you determine whether a relation is a function?
- What does it mean for two variables to be directly related?
- Why does the graph of a direct variation function always pass through the origin?
- How are directionality and slope related in linear functions?
- What generalization can you make about a graph's slope?
- When would you use *slope-intercept form* versus *point-slope form*?
- In what ways are transformations in graphs represented in their related functions?
- What characteristics of the equation result in the V shape opening upward or downward? In a vertical stretch? In a vertical compression? In a vertical translation? In a horizontal translation?
- When determining what inequality a graph represents, what do you need to find?

Standards: A-CED 1, A-SSE 1b, F-IF 1, A-CED 2, F-IF 9, F-BF 3

Suggested Timeframe: 2 weeks/12 days
Start Date: August 17, 2017
Assessment Dates: Aug. 31 – Sept. 1, 2017

Time	Lesson/ Activity	Focus Questions for Lessons	Understandings	Knowledge	Skills	Resources
1 day (Aug. 17th)	**Topic 1 Opening Activity** (p. 3 Common Core Performance Task)					
½ Day (Aug. 18th)	**Lesson 1-4: Solving Equations** SMP: 1,3,4,6 (pp. 26-32) **A-CED 1**	• How can you interpret your answer(s) when solving equations? • What does it mean for an equation to have a solution, no solution, or be an identity? **Inquiry Question Options:** p. 26 "Solve It"	• You can use the properties of equality and inverse operations to solve equations. • Solving an equation that contains a variable means finding all values of the variable that make the equation true (*solutions*). An equation has *no solution* if no value of the variable makes the equation true. For *identities*, all values of the variable make the equation true.	**Vocabulary:** equation, solution of an equation, inverse operations, identity, literal equation • **Properties of Equality:** Reflexive, Symmetric, Transitive, Substitution, Addition, Subtraction, Multiplication, Division	• Find unknown quantities by relating them to know quantities. • Interpret the solutions to equations. • Solve and write equations.	**Common Core Problems:** 7,8,9, 26,27,28,45,52, 61,62,63,64,65 **Thinking Maps:** Tree Map for different types of solutions to equations.

Common Core Practices

- ☐ Instruction in the Standards for Mathematical Practices
- ☐ Use of Talk Moves
- ☐ Note-taking
- ☐ Use of Manipulatives
- ☐ Use of Technology
- ☐ Use of Real-world Scenarios
- ☐ Project-based Learning
- ☐ Thinking Maps

Time	Lesson/ Activity	Focus Questions for Lessons	Understandings	Knowledge	Skills	Additional Resources
½ Day (Aug. 18th)	**Lesson 1-5: Solving Inequalities** SMP: 1,3,4,7 (pp. 33-40) **A-CED 1**	• How are the solutions to a compound inequality joined by *and* different from those joined by *or*? **Inquiry Question Options:** p. 33 "Solve It"	• You can use the properties of equality and inverse operations to solve inequalities. • The solutions of inequality are the numbers that make it true. • You can join two inequalities with the word *and* or the word *or* to form a compound inequality. • To solve a compound inequality containing *and*, find all values of the variable that make both inequalities true.	**Vocabulary:** compound inequality • **Properties of Inequalities:** Transitive, Addition, Subtraction, Multiplication, Division	• Interpret the solutions to inequalities. • Solve, graph, and write inequalities and compound inequalities.	**Common Core Problems:** 6,7,8,9,24-27, 44, 51-56, 57-58, 62-66 **Thinking Maps:** Double Bubble Map to compare Properties of Equality to Properties of Inequalities
1 Day (Aug. 21)	**Lesson 1-6: Absolute Value Equations and Inequalities** SMP: 1,3 (pp. 41-48) **A-CED 1** **A-SSE 1b**	• What are the characteristics of absolute value equations and inequalities? • Why can absolute value equations be written as two different linear equations? **Inquiry Question Options:** p. 41 "Solve It"	• An absolute value quantity is nonnegative. • Since opposites have the same absolute value, an absolute value equation can have two solutions. • Absolute value inequalities can be written as compound inequalities without absolute value signs.	**Vocabulary:** absolute value, extraneous solution • Solutions of Absolute Value Statements	• Write and solve equations and inequalities involving absolute value. • Interpret the results and graphs of absolute value equations and inequalities.	**Common Core Problems:** 6, 7, 8, 9, 53-56, 67-81, 88-89 **Thinking Maps:** Double Bubble Map to compare how absolute value equations and inequalities are like linear equations and inequalities and how they are different.
1 Day (Aug. 22)	**Lesson 2-1: Relations and Functions** SMP: 1,3,4 (pp. 60-67) **F-IF 1**	• How can you determine whether a relation is a function? **Inquiry Question Options:** p. 60 "Solve It"	• A relation is a set of pairs of input and output values. • Relations can be represented with ordered pairs, mapping diagrams, tables of values, and graphs.	**Vocabulary:** relation, domain, range, function, vertical-line test, function rule, function notation, independent variable, dependent variable • Four Ways to Represent Relations	• Identify and graph functions. • Explain why the vertical-line test can help you identify a function, and why there is no horizontal-line test.	**Common Core Problems:** 5,6,7, 8-9, 25-28, 31-35, 39 **Thinking Maps:** Tree Map for Four Ways to Represent Relations (p. 60).

Common Core Practices

- ☐ Instruction in the Standards for Mathematical Practices
- ☐ Use of Talk Moves
- ☐ Note-taking
- ☐ Use of Manipulatives
- ☐ Use of Technology
- ☐ Use of Real-world Scenarios
- ☐ Project-based Learning
- ☐ Thinking Maps

Time	Lesson/ Activity	Focus Questions for Lessons	Understandings	Knowledge	Skills	Additional Resources
1 Day (Aug. 23)	**Lesson 2-3: Linear Functions and Slope-Intercept Form** SMP: 1,3,4 (pp. 74-80) **A-CED 2**	• How are directionality and slope related in linear functions? **Inquiry Question Options:** p. 74 "Solve It"	• The graph of a linear function is a line. You can represent a linear function with a linear equation. • Given two points on a line, the slope of the line is the *ratio of the change* in the y-coordinates to the change in the corresponding x-coordinates. • The *slope* is the coefficient of x when you write a linear equation in slope-intercept form.	**Vocabulary:** slope, linear function, linear equation, y-intercept, x-intercept, slope-intercept form • **Formulas for:** slope, slope-intercept form	• Graph linear equations. • Write equations of lines.	**Common Core Problems:** 5,6,7, 17-21, 46, 56-58, 62 **Thinking Maps:** Brace Map to show the parts of an equation of a line in slope-intercept form.
1 Day (Aug. 24)	**Lesson 2-4: More About Linear Equations** SMP: 1,3,7 (pp. 81-88) **F-IF 9**	• What generalization can you make about a graph's slope? • When would you use *slope-intercept form* versus *point-slope form*? **Inquiry Question Options:** p. 81 "Solve It"	• You write the equation of a line in *point-slope form* when you have a point and the slope or when you have two points. • The *standard form* of an equation has both variables and no constants on the left side. • When two lines have the same slope, they are *parallel.* • When two lines have slopes that are negative reciprocals of each other, they are *perpendicular*.	**Vocabulary:** point-slope form, standard form of a linear equation, parallel lines, perpendicular lines • **Formulas for:** point-slope form, standard form of a linear equation	• Write an equation of a line given its slope and a point on the line.	**Common Core Problems:** 6, 7, 8, 9, 30-31, 45, 48, 49, 52, 53-56 **Thinking Maps:** Tree Map for three ways to write equations of lines (p. 83).
1 Day (Aug. 25)	**Lesson 2-6: Families of Functions** SMP: 1,3,7 (pp. 99-106) **F-BF 3**	• In what ways are transformations in graphs represented in their related functions? **Inquiry Question Options:** p. 99 "Solve It"	• A parent function is the simplest form of a function in a family of functions. Each member is a transformation of the parent function. • Translations shift the graph horizontally, vertically, or both. A reflection flips the graph over a line of symmetry. Vertical stretches and compressions change the shape of the graph by a factor.	**Vocabulary:** parent function, transformation, translation, reflection, vertical stretch, vertical compression • Vertical Translation • Horizontal Translation	• Analyze and describe transformation of functions.	**Common Core Problems:** 7,8,9, 26-29, 30-31, 34-50 **Thinking Maps:** Circle Map with types of transformations (p. 102).

Common Core Practices

- ☐ Instruction in the Standards for Mathematical Practices
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- ☐ Use of Technology
- ☐ Use of Real-world Scenarios
- ☐ Project-based Learning
- ☐ Thinking Maps

Time	Lesson/ Activity	Focus Questions for Lessons	Understandings	Knowledge	Skills	Additional Resources
1 Day (Aug. 28)	**Lesson 2-7: Absolute Value Functions and Graphs** SMP: 1,3,5 (pp. 107-113) **F-BF 3**	• What characteristics of the equation result in the V shape opening upward or downward? In a vertical stretch? In a vertical compression? In a vertical translation? In a horizontal translation? **Inquiry Question Options:** p. 107 "Solve It"	• The absolute value function $y = \|x\|$ is the parent function for the family of functions of the form $y = a\|x - h\| + k$. • The maximum or minimum point of the graph is the vertex of the graph.	**Vocabulary:** absolute value function, axis of symmetry, vertex • Absolute Value Parent Function $y = \|x\|$ • General Form of the Absolute Value Function $y = a\|x - h\| + k$	• Graph absolute value functions.	**Common Core Problems:** 5,6,7, 29-30, 31-35, 45-46
1 Day (Aug. 29)	**Lesson 2-8: Two-Variable Inequalities** SMP: 1,3,4,5,7 (pp. 114-120) **A-CED 2**	• When determining what inequality a graph represents, what do you need to find? **Inquiry Question Options:** p. 114 "Solve It"	• An inequality describes a region of the coordinate plane that has a boundary. • To graph an inequality involving two variables, first graph the boundary. Then determine which side of the boundary contains the solutions. Points on a dashed boundary are not solutions. Points on a solid boundary are solutions.	**Vocabulary:** linear inequality, boundary, half-plane, test point	• Graph two-variable inequalities.	**Common Core Problems:** 5,6,7, 27-29, 38, 39-44, 46, 47
1 day (Aug. 30th)	**Topic 1 Performance Task** (p. 59 & 121 Common Core Performance Task)					
1 day (Aug. 31st)	**Review Topic 1 Concepts & Skills** Use Textbook Resources and/or Teacher Created Items					
1 day (Sept. 1st)	**Topic 1 Assessment** (Created and provided by PUSD)					

Common Core Practices

- ☐ Instruction in the Standards for Mathematical Practices
- ☐ Use of Talk Moves
- ☐ Note-taking
- ☐ Use of Manipulatives
- ☐ Use of Technology
- ☐ Use of Real-world Scenarios
- ☐ Project-based Learning
- ☐ Thinking Maps

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