**HS Mathematics Survey**

1. What math curriculum are you currently using this school year? *(Please check ALL that apply.)*

❒ Agile Mind (Agile Mind)

❒ CME (Pearson)

❒ Core Plus (McGraw-Hill Education)

❒ CPM (College Preparatory Math)

❒ Eureka Math/Engage NY (Great Minds/OER)

❒ Glencoe Math (McGraw-Hill Education)

❒ McDougal Littell Series

❒ Springboard (College Board)

❒ Other *(please specify)* \_\_\_\_\_\_\_\_\_\_\_­­\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

2. In the last 12 months, how much training, professional development, or professional learning about the Common Core State Standards have you participated in in total?

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | ½ day | 1 day (1-4 hours) | 2 days (5-8 hours) | 3 days (9-16 hours) | 4-5 days  | >5 days |
| General training on the Common Core State Standards |  |  |  |  |  |  |
|  | ½ day | 1 day (1-4 hours) | 2 days (5-8 hours) | 3 days (9-16 hours) | 4-5 days  | >5 days |
| Content-specific training on the Common Core State Standards for Mathematics |  |  |  |  |  |  |

3. How familiar are you with the Common Core State Standards for the grade(s) / subject(s) you teach?

🔿 Very unfamiliar

🔿 Somewhat unfamiliar

🔿 Somewhat familiar

🔿 Very familiar

The next section is designed to provide a collective snapshot of the current Common Core Mathematics knowledge and practice in your local setting. As a reminder, the results of this survey are confidential. In order to gather the most accurate information, please do not guess on the items, and answer as candidly as possible. Remember that many items have no correct or incorrect answers.

Not all content in a given grade is emphasized equally in the Common Core State Standards. Some clusters require greater emphasis than others based on the depth of the ideas, the time that they take to master, and/or their importance to future mathematics or the demands of college and career readiness. This content is referred to as “Major Work.” The Common Core encourages the emphasis of Major Work in each grade, rather than trying to cover all of the standards equally.

4. Which of the following belong to the Major Work of the grade selected for this survey? Determine the major work for the grade level you teach, as well as for the grade below and above. *(Please check ALL that apply.)*

1. 8th grade

❒ a) Represent and analyze quantitative relationships between dependent and independent variables

❒ b) Define, evaluate, and compare functions

❒ c) Understand and apply the Pythagorean Theorem

❒ d) Understand and calculate probability of single events

❒ e) I don’t know.

1. Typical 9th grade course (e.g., Algebra I)

❒ a) Quadratic inequalities

❒ b) Examine transformations on the coordinate plane

❒ c) Linear and quadratic functions

❒ d) Create equations to model situations

❒ e) I don’t know.

1. Typical 11th grade course (e.g., Algebra II)

❒ a) Exponential and logarithmic functions

❒ b) Polar coordinates

❒ c) Using functions to model situations

❒ d) Identify the measures of central tendency and distribution

❒ e) I don’t know.

5. Over the past school year, how frequently have you done the following?

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | Almost never/Never | About once a month | Several times a month | About weekly | Several times a week |
| a) Discussed Common Core State Standards for Mathematics with teachers in other grades |  |  |  |  |  |
| b) Discussed Common Core State Standards for Mathematics with teachers in your own grade |  |  |  |  |  |
| c) Looked at student mathematical work with other teachers for the purposes of professional development |  |  |  |  |  |
| d) Received suggestions from colleagues for curricular materials aligned to the Common Core State Standards for Mathematics |  |  |  |  |  |

The Common Core State Standards balance three aspects of rigor:

* **Conceptual understanding**: students know the meaning behind the math,
* **Procedural skill and fluency**: students can quickly and accurately perform operations, and
* **Application**: students apply their skills and knowledge in real world situations.

The next questions examine those aspects of rigor.

6. Examine each Common Core State Standard below carefully and check which aspect(s) of rigor are being targeted.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Conceptual Understanding | Procedural Skill and Fluency | Application | I don’t know |
| a) Rewrite expressions involving radicals and rational exponents using the properties of exponents. |  |  |  |  |
| b) 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*). |  |  |  |  |
| c) 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.* |  |  |  |  |
|  | Conceptual Understanding | Procedural Skill and Fluency | Application | I don’t know |
| d) Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters. |  |  |  |  |
| e) Use proportional relationships to solve multistep ratio and percent problems. *Examples: simple interest, tax, markups and markdowns, gratuities and commissions, fees, percent increase and decrease, percent error.* |  |  |  |  |

7. Please indicate the extent to which you agree or disagree with the following statements as they relate to your mathematics teaching this school year.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|   | Strongly Disagree | Somewhat Disagree | Somewhat Agree | Strongly Agree  | Not Applicable |
| a) I choose which standards to teach based on the major work of the grade. |  |  |  |  |  |
| b) I try to incorporate conceptual understanding into every lesson that I teach. |  |  |  |  |  |
| c) I try to incorporate real-world applications into every lesson that I teach. |  |  |  |  |  |
| d) I use the textbook to determine the order of the standards that I teach. |  |  |  |  |  |
| e) I use the wording of the standards to determine if procedural skills, conceptual understanding, and/or real-world applications are emphasized in my lessons. |  |  |  |  |  |
| f) I order lessons based on the order of the standards at my grade. |  |  |  |  |  |
|  | Strongly Disagree | Somewhat Disagree | Somewhat Agree | Strongly Agree  | Not Applicable |
| g) I spend less time in the classroom on additional/supporting standards. |  |  |  |  |  |
| h) I organize which standards to teach based on how they connect to one another within and across units. |  |  |  |  |  |
| i) I seek to balance my unit across procedural skills, conceptual knowledge and real-world applications. |  |  |  |  |  |
| j) I consider students’ prior knowledge when writing my lesson and learning objective. |  |  |  |  |  |
| k) I try to give equal importance to all topics throughout the year. |  |  |  |  |  |

The CCSS emphasizes coherence *across* grades through progressions of topics over multiple grade-levels.

8. Consider this standard.

Solve linear equations in one variable.

1. Give examples of linear equations in one variable with one solution, infinitely many solutions, or no solutions. Show which of these possibilities is the case by successively transforming the given equation into simpler forms, until an equivalent equation of the form *x = a, a = a,* or *a = b* results (where *a* and *b* are different numbers).
2. Solve linear equations with rational number coefficients, including equations whose solutions require expanding expressions using the distributive property and collecting like terms.

This standard is a preceded by which of the following standards? *(Select one.)*

🔿 a) 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.

* 1. Solve word problems leading to equations of the form *px + q = r* and *p(x + q) = r*, where *p*, *q*, and *r* are specific rational numbers. Solve equations of these forms fluently. Compare an algebraic solution to an arithmetic solution, identifying the sequence of the operations used in each approach. *For example, the perimeter of a rectangle is 54 cm. Its length is 6 cm. What is its width?*
	2. Solve word problems leading to inequalities of the form *px + q > r* or *px + q < r*, where *p, q,* and *r* are specific rational numbers. Graph the solution set of the inequality and interpret it in the context of the problem. *For example: As a salesperson, you are paid $50 per week plus $3 per sale. This week you want your pay to be at least $100. Write an inequality for the number of sales you need to make, and describe the solutions.*

🔿 b) Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters.

🔿 c) Solve quadratic equations in one variable.

1. 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.
2. Solve quadratic equations by inspection (e.g., for *x²* = 49), taking square roots, completing the square, the quadratic formula and factoring, as appropriate to the initial form of the equation. Recognize when the quadratic formula gives complex solutions and write them as *a ± bi* for real numbers *a* and *b*.

🔿 d) Solve quadratic equations with real coefficients that have complex solutions.

🔿 e) I don’t know

9. Consider this standard.

Solve quadratic equations in one variable.

1. 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.
2. Solve quadratic equations by inspection (e.g., for *x²* = 49), taking square roots, completing the square, the quadratic formula and factoring, as appropriate to the initial form of the equation. Recognize when the quadratic formula gives complex solutions and write them as *a ± bi* for real numbers *a* and *b*.

This standard prepares students for which of the following standards? *(Select one.)*

🔿 a) 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.

* 1. Solve word problems leading to equations of the form *px + q = r* and *p(x + q) = r*, where *p*, *q*, and *r* are specific rational numbers. Solve equations of these forms fluently. Compare an algebraic solution to an arithmetic solution, identifying the sequence of the operations used in each approach. *For example, the perimeter of a rectangle is 54 cm. Its length is 6 cm. What is its width?*
	2. Solve word problems leading to inequalities of the form *px + q > r* or *px + q < r*, where *p, q,* and *r* are specific rational numbers. Graph the solution set of the inequality and interpret it in the context of the problem. *For example: As a salesperson, you are paid $50 per week plus $3 per sale. This week you want your pay to be at least $100. Write an inequality for the number of sales you need to make, and describe the solutions.*

🔿 b) Solve linear equations in one variable.

1. Give examples of linear equations in one variable with one solution, infinitely many solutions, or no solutions. Show which of these possibilities is the case by successively transforming the given equation into simpler forms, until an equivalent equation of the form *x = a, a = a,* or *a = b* results (where *a* and *b* are different numbers).
2. Solve linear equations with rational number coefficients, including equations whose solutions require expanding expressions using the distributive property and collecting like terms.

🔿 c) Solve quadratic equations with real coefficients that have complex solutions.

🔿 d) Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters.

🔿 e) I don’t know

The CCSS also emphasizes coherence *within* grades through explicit connections among topics within the grade.

10. From the list of five standards below, select *three* (in any order) that could be taught together in a coherent unit. Please ensure that you select three standards.

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

❒b) 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).

❒ c) Prove polynomial identities and use them to describe numerical relationships. *For example, the polynomial identity (x² + y²)² = (x² - y²)² + (2xy)² can be used to generate Pythagorean triples.*

❒ d) Understand that polynomials form a system analogous to the integers, namely, they are closed under the operations of addition, subtraction, and multiplication; add, subtract, and multiply polynomials.

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

❒ f) Derive the equation of a parabola given a focus and directrix.

11. Please briefly explain below your reasoning for your selections.

Yesterday, Mr. Jones taught a math lesson to his high school class and he would like comments on a few elements of his lesson.

12. Mr. Jones wants to be sure his lesson plan was Common Core-aligned. This was his objective for the class: *“Students will sort and classify equations by carrying out algebraic manipulations and by substituting numbers into algebraic statements in order to test their validity in special cases.”* This objective is: *(Select one.)*

🔿 a) Supporting Work of high school

🔿 b) Major Work of high school

🔿 c) Not a high school objective

🔿 d) I don’t know.

13. Which activity would be appropriate for this lesson objective? *(Select one.)*

🔿 a) Students graph a collection of quadratic equations in vertex form.

🔿 b) Students sort and classify equations as linear, exponential, and quadratic, and justify their results based on the graphs.

🔿 c) Students algebraically manipulate linear equations from point-slope to slope-intercept form.

🔿 d) Students create transformations of parabolas by changing the algebraic representation of the graph.

🔿 e) I don’t know.

Mr. Jones used the following lesson plan to meet his objective:

*Lesson*: Sorting and Classifying Equations

*Objective*:

**Students will be able to differentiate between linear, exponential, and quadratic equations.**

*Activity:*

Set up the task by telling students you are going to put them in groups and give them a number of equations to sort into three categories:

* Linear
* Exponential
* Quadratic

While working on the group task, the team must reach a consensus for each equation. All team members must be prepared to justify and explain their solutions and teams must show all work.

Sort the class into teams of two or three and pass out materials to each team. Ask students to divide their large sheet into three columns and title the columns: Linear, Exponential, Quadratic.

Students move through the list of equations, placing each one in the appropriate column. While students are working, walk around and listen to team conversations.

When all groups are finished, have a whole class discussion. Discuss strategies that students used to make decisions. Challenge students to use mathematics to prove where the equations belong.

14. In the lesson plan above, which type(s) of student learning is/are addressed? *(Please check ALL that apply.)*

❒ a) Conceptual understanding is addressed.

❒ b) Procedural skill is addressed.

❒ c) Application is addressed.

❒ d) None of the above is addressed.

❒ e) I don’t know.

15. Which standard(s) is/are addressed in the lesson plan? *(Please check ALL that apply.)*

❒ a) Know and apply the Binomial Theorem for the expansion of *(x + y)n* in powers of *x* and *y* for a positive integer *n*, where *x* and *y* are any numbers, with coefficients determined for example by Pascal’s Triangle.

❒ b) Identify zeroes of polynomials when suitable factorizations are available, and use the zeroes to construct a rough graph of the function defined by the polynomial.

❒ c) Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases.

❒ d) Solve real-world and mathematical problems leading to two linear equations in two variables. *For example, given coordinates for two pairs of points, determine whether the line through the first pair of points intersects the line through the second pair.*

❒ e) None of the above.

❒ f) I don’t know.

16. Briefly, how would you improve upon the lesson plan to more thoroughly address this/these standard(s)?

17. Given the same lesson plan, which statement(s) below reflect the lesson? *(Please check ALL that apply.)*

❒ a) The lesson asks students to attend to precision.

❒ b) The lesson asks students to reason abstractly and quantitatively.

❒ c) The lesson asks students to construct arguments and critique reasoning in others.

❒ d) The lesson requires students to model with mathematics.

❒ e) The lesson has students look for and express repeated reasoning.

❒ f) The lesson builds on previous knowledge.

❒ g) The lesson encourages students to use appropriate tools strategically.

❒ h) I don’t know

18. Which prerequisite content will prepare students for this lesson? *(Select one.)*

🔿 a) Compute unit rates associated with ratios of fractions, including ratios of lengths, areas and other quantities measured in like or different units.

🔿 b) Apply and extend previous understandings of addition and subtraction to add and subtract rational numbers; represent addition and subtraction on a horizontal or vertical number line diagram.

🔿 c) Interpret the equation y = mx + b as defining a linear function, whose graph is a straight line; give examples of functions that are not linear.

🔿 d) Convert a rational number to a decimal using long division; know that the decimal form of a rational number terminates in zeros or eventually repeats.

🔿 e) None of the above.

🔿 f) I don’t know.

19. This lesson most directly prepares students to learn which of the following standards? *(Select one.)*

🔿 a) Know and apply the Binomial Theorem for the expansion of *(x + y)n* in powers of *x* and *y* for a positive integer *n*, where *x* and *y* are any numbers, with coefficients determined for example by Pascal’s Triangle.

🔿 b) Graph rational functions, identifying zeros and asymptotes when suitable factorizations are available, and showing end behavior.

🔿 c) Compose functions. *For example, if T(y) is the temperature in the atmosphere as a function of height, hand h(t) is the height of a weather balloon as a function of time, then T(h(t)) is the temperature at the location of the weather balloon as a function of time.*

🔿 d) Understand that rational expressions form a system analogous to the rational numbers, closed under addition, subtraction, multiplication, and division by a nonzero rational expression; add, subtract, multiply, and divide rational expressions.

🔿 e) None of the above.

🔿 f) I don’t know.

20. Thinking about the last complete unit that you taught, how often did you do the following?

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | Never | Rarely | Sometimes | Often | In all or most lessons |
| a) Build on prior skills and knowledge when teaching new content |  |  |  |  |  |
| b) Ground procedures and formulas in conceptual understanding |  |  |  |  |  |
| c) Make the mathematics of the lesson explicit by using explanations, representations, and/or examples |  |  |  |  |  |
| d) Use repeated practice to improve students' computational skills |  |  |  |  |  |
| e) Have students do work with and practice grade-level problems and exercises. |  |  |  |  |  |
| f) Emphasize one solution method to strengthen all students’ understanding of the content  |  |  |  |  |  |
| g) Have students choose and use appropriate tools when solving a problem |  |  |  |  |  |
|  | Never | Rarely | Sometimes | Often | In all or most lessons |
| h) Check for understanding throughout the lesson using informal, but deliberate methods (such as questioning or assigning short problems) |  |  |  |  |  |
| i) Summarize the mathematics with references to student work to reinforce the focus of the lesson |  |  |  |  |  |
| j) Predominantly use questions and problems that are from the textbook |  |  |  |  |  |
| k) Review standards from previous grades |  |  |  |  |  |
| l) Ask students to explain and justify their work |  |  |  |  |  |
| m) Provide feedback to help students revise initial work |  |  |  |  |  |

21. A teacher walking around the classroom overhears the comments below during student group work. Which comment shows students demonstrating the practice standard ‘**construct viable arguments and critique the reasoning of others’**? *(Select one.)*

🔿 a) “That could be the answer, or the answer could be $y=x^{2}+2$.”

🔿 b) “No, the answer can’t be $y=-x^{2}+2$, because we know the parabola opens up so it must have a positive squared term.”

🔿 c) “Yep, I agree that the answer is $y=-x^{2}-2$.”

🔿 d) “I don’t think the answer is $y=-x^{2}-2$. I’m going to ask the teacher.”

🔿 e) I don’t know

22. Which scenario shows students demonstrating the practice standard ‘**model with mathematics’**? *(Select one.)*

🔿 a) Students completing a worksheet on factoring quadratics to identify the zeros.

🔿 b) Students interpreting the graphs of polynomial expressions based on their coefficients.

🔿c) Students working together to create a function that represents the path of a kicked football.

🔿 d) Students answering a set of routine word problems on quadratic relationships.

🔿 e) I don’t know

23. In the last year, how frequently have you used the following websites for free resources and information about the Common Core State Standards?

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | Almost never/Never | About once a month | Several times a month | About weekly | Several times a week |
| Teaching Channel |  |  |  |  |  |
| Teachers Pay Teachers |  |  |  |  |  |
| LearnZillion |  |  |  |  |  |
| Share My Lesson |  |  |  |  |  |
| BetterLesson |  |  |  |  |  |
|  | Almost never/Never | About once a month | Several times a month | About weekly | Several times a week |
| Achieve the Core |  |  |  |  |  |
| Khan Academy |  |  |  |  |  |
| Pinterest |  |  |  |  |  |
| My state education agency website |  |  |  |  |  |
| My district education agency website |  |  |  |  |  |
| Other state or district education agency website |  |  |  |  |  |
| Other *(please specify)* |  |  |  |  |  |

Thank you very much for the time and thought you have put into completing this survey.

For more information about the organization conducting this research,

Student Achievement Partners,

visit [www.achievethecore.org](http://www.achievethecore.org).