Standards-Based Grading in Math

Chris Shore
The Math Projects Journal
Murrieta Valley USD
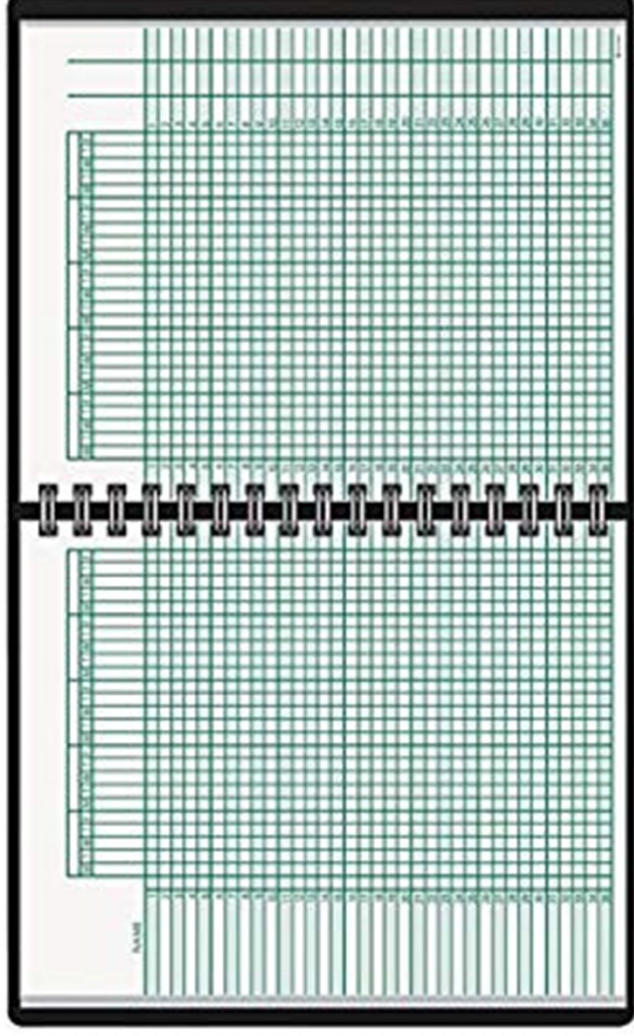**@MathProjects**

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Why SBG in Math?

Continuous, not Discrete

Grading the SMPs

1. Make sense of problems and persevere in solving them.
2. Reason abstractly and quantitatively.
3. Construct viable arguments and critique the reasoning of others.
4. Model with mathematics.
5. Use appropriate tools strategically.
6. Attend to precision.
7. Look for and make use of structure.
8. Look for and express regularity in repeated reasoning.

Grading for Learning

Credit Recovery & Intervention

Avoid Grade Inflation

Inform Parents

SB Instruction

Calibration

1

What SBG in Math Needs

Trend Grading

Rubrics

The Number System
- Know that there are numbers that are not rational, and approximate them by rational numbers.

Expressions and Equations
- Work with radicals and integer exponents.
- Understand the connection between proportional relationships, lines, and linear equations.
- Analyze and solve linear equations and pairs of simultaneous linear equations.

Functions
- Define, evaluate, and compare functions.
- Use functions to model relationships between quantities.

Geometry
- Understand congruence and similarity using physical models, transparencies, or geometry software.
- Understand and apply the Pythagorean Theorem.
- Solve real-world and mathematical problems involving volume of cylinders, cones, and spheres.

Statistics and Probability
- Investigate patterns of association in bivariate data.

Clusters, Claims & Values

Hope

2
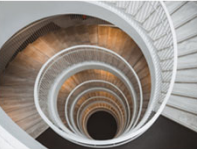
How SBG in Math Works

Re-Assessment

Cumulative Practice

0% Categories

Example in Aeries

Self-Reflection

3

Standards-Based Grading Works!

3. Leah is mowing lawns for a summer job. She charges an initial fee plus $6 for each hour of work. **Her total fee for a 4-hr job is $32.**

a. Fill in the table and sketch a graph. Label and scale the axes.

x	m(x)
0	10
1	16
2	22
3	28
4	32

(handwritten red annotations showing: 32 −6 = 28 −6' , 28 −6' = 22 , 22 −6' = 16 , 16 −6' = 10)

b. How much is Leah's initial fee?

| Leah's init fee is 10 |

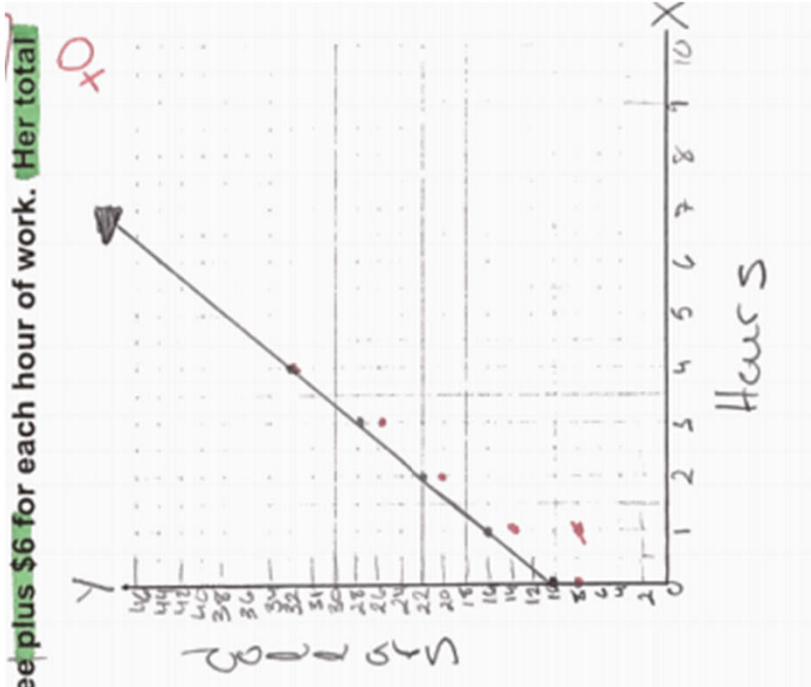c. Write the rule/explicit equation that represents

$$f(n) = 16 + 6(n-1)$$

$$f(x) = 8 + 6x$$

d. What type of function is this? (Linear or Exponential) Why?

It is linear because it is a straight line and it is based off an arithmetic equation.

e. Is the graph discrete or continuous? Why?

(graph with x-axis labeled "Hours" marked 1–10, and y-axis with values)

C. Shore   Name _____
ALGEBRA 1

Quiz #10
Writing & Solving Quadratics

CREATIVITY
1) a) Write a quadratic equation in factored form. _____
    It must have two different zeros, which are not equal to 0.

    b) Rewrite your equation in standard form. _____

    c) Rewrite that equation in vertex form. _____

$$x = \frac{-b}{2a}$$

CONCEPTS & PROCEDURES 1
2) Find the zeros of your standard form equation in #1b using the quadratic
    equation and show that the solutions are the same as the zeros in #1a.

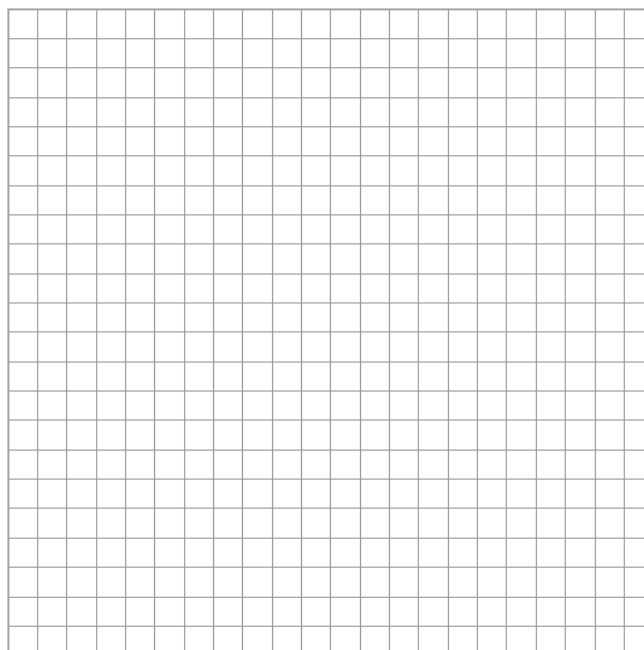$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

3) Graph your equation, designating the following:

y-int: (0,   )

Axis of Symetery: x = _____

Vertex: (,   )

Zeros: (, 0) & (, 0)

COMMUNICATING REASONING 1
4) How do the values of h & k in the equation $f(x) = a(x - h)^2 + k$ affect the graph of the parent function $y = x^2$?

CONSTRUCTING MODELS 1
5) Write the equation that represents the function in the table.

a)

x	-2	-1	0	1	2
y	0	2	4	6	8

b)

x	-2	-1	0	1	2
y	1/4	1/2	1	2	4

c)

x	-2	-1	0	1	2
y	4	1	0	1	4

y = _____   y = _____   y = _____

CONCEPTS & PROCEDURES 2
6) Solve: a) $35 = x^2 - 1$ b) $x^2 - 3x = 10$

7) Solve. Give both exact and approximate values where appropriate.

a) $x^2 - 8x + 16 = 0$ b) $x^2 + x + 2 = 0$ c) $4x^2 + 6x + 1 = 0$

CRITICAL THINKING

8) **"A load of gold worth up to $54 million went missing during the Civil War. There may be a break in the case.**

For decades, Civil War buffs and assorted fortune seekers have combed northwestern Pennsylvania, looking for a Union shipment of gold that reportedly was lost near tiny Dents Run in June 1863…the Union wagon train was carrying up to 52 bars of gold weighing 50 pounds each -- a haul worth some $54 million in today's market." (CNN, 2018)

a) At the time the article was written, gold was worth aprroximately how much per ounce? (16 oz = 1 pound)

b) Given our formula for compound interest, $A = P(1 + r)^t$, and an inflation rate of 3%, how much would the $54 million have been worth at the time that the gold went missing?

COMMUNICATING REASONING 2

9) Once #1-8 are completed. Use graphing software to check your answers. Explain any errors that you found and corrected.

CONSTRUCTING MODELS 2

10) ***Cannon Man***: Go to student.desmos.com. (Do not login with Google.) Sign in with your period and group number. (e.g. P3G8)

Class Code: _____

Step 1: Play the video of Cannon Man several times. Discuss as many detailed observations of his height and the time as you can.

Step 2: Make as many attempts at the graph as necessary to get your Cannon Man to match the path of the computer's Cannon Man.

Step 3: Record your most accurate graph.

height off ground

time