

THE REWARDS AND CHALLENGES OF STANDARDS BASED GRADING

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AGENDA

- Who we are and why we did this
- SBG Principles
- Rubric Grading for math
- Let's do some grading
- Calibrate & Debrief
- Tips for getting started
- Q&A

WHY DID WE MOVE TO SBG?

- Dissatisfaction with the point system
- Your grade should reflect what you know
- Better feedback for students
- Multiple assessments on the same content

WHY SBG?

2. Calculate the slope of a line that passes through $(-4,5)$ and $(8,2)$.

$$\frac{8 - -4}{5 - 2}$$
$$\frac{12}{3}$$
$$4$$

-5

PRINCIPLES OF SBG

1. Grades should reflect what a student knows
 - Points → Rubrics
 - Preparation → Learning
 - Extra Credit?

PRINCIPLES OF SBG

2. Assessment is designed around content
 - Textbook sections → Mathematical concepts
 - Broad → Focused

PRINCIPLES OF SBG

3. Grades should be assigned qualitatively
 - Points → Rubrics
 - Rubrics can be non-linear
 - Numbers → Letters

PRINCIPLES OF SBG

4. Students should have more than one opportunity to show you what he/she knows
 - Once → Multiple
 - Only Teacher-initiated → Sometime Student-initiated

PRINCIPLES OF SBG

5. Feedback should give qualitative information about a student's work
 - Grades convey meaning about work quality
 - Converts conversation from point-grubbing to discussion about errors and how to fix them

PRINCIPLES OF SBG

1. Grades should reflect what a student knows
2. Assessment is designed around content
3. Grades should be assigned qualitatively
4. Students should have more than one opportunity to show you what he/she knows
5. Feedback should give qualitative information about a student's work

RUBRIC GRADING IN MATH

- But we like numbers...
- Rubric could be non-linear
- If too generic, then not meaningful
- If too specific, then not sustainable

	A = 95	B = 85	C = 75	D = 65	F = 55
Progress (30%) - improvement - consistency - willingness - perseverance [This category will be called "Miscellaneous" for the online grade book.]	☐ Consistent high achievement (above 90% level). -OR- ☐ Consistent improvement (each assessment is better than the previous one). ☐ Consistent perseverance on difficult concepts (even without high performance).	☐ Consistent medium-high achievement (above 80% level). -OR- ☐ Mostly consistent improvement (a general trend of improvement, but with some lower performance allowed). ☐ Mostly consistent perseverance on difficult concepts (often striving to succeed).	☐ Consistent medium achievement (above 70% level). -OR- ☐ No discernable improvement (each assessment is about the same as the previous one). ☐ Some perseverance on difficult concepts (often trying to maintain a medium level or performance)	☐ Consistent low achievement (above 60% level). -OR- ☐ Inconsistent progress (a general trend of poorer performance) ☐ Rare perseverance on difficult concepts (often not trying to be successful).	☐ Consistent very low achievement (below 60% level). -OR- ☐ Consistent lack of improvement (each assessment is worse than the previous one). ☐ No perseverance on difficult concepts.
Participation (30%) - homework - classwork - notes - discussions	☐ More than 90% of homework completed. ☐ More than 90% of class notes taken. ☐ More than 90% of classwork completed. ☐ Regularly (8-10 times per week) asks questions and/or contributes meaningfully to discussions.	☐ More than 75% of homework completed. ☐ More than 75% of class notes taken. ☐ More than 75% of classwork completed. ☐ Often (6-8 times per week) asks questions and/or contributes meaningfully to discussions.	☐ More than 50% of homework completed. ☐ More than 50% of class notes taken. ☐ More than 50% of classwork completed. ☐ Sometimes (4-6 times per week) asks questions and/or contributes meaningfully to discussions.	☐ Less than 50% of homework completed. ☐ Less than 50% of class notes taken. ☐ Less than 50% of classwork completed. ☐ Rarely (2-4 times per week) asks questions and/or contributes meaningfully to discussions.	☐ Less than 10% of homework completed. ☐ Less than 10% of class notes taken. ☐ Less than 10% of classwork completed. ☐ Does not ask questions and/or contribute meaningfully to discussions (less than twice per week)
Performance (40%) - quizzes - tests - activities - projects	☐ Test scores average 90% - 100%. ☐ Quiz, activity & project scores average 80% - 100%.	☐ Test scores average 80% - 90%. ☐ Quiz, activity & project scores average 70% - 90%.	☐ Test scores average 70% - 80%. ☐ Quiz, activity & project scores average 60% - 80%.	☐ Test scores average 60% - 70%. ☐ Quiz, activity & project scores average 50% - 70%.	☐ Test scores average below 60%. ☐ Quiz, activity & project scores average below 50%.

RUBRIC GRADING IN ALGEBRA

Score:	A	B	C	D	F
Explanation of score:	Algebra & Arithmetic is correct. The solution is complete.	Algebra is correct. Possible minor Arithmetic errors in the solution.	Minor Algebra error(s) present. Solution is incomplete but correct.	Major Algebra error(s) present. Solution is incomplete and incorrect.	Almost no attempt was made to provide a solution.
What I want you to learn from the score:	"I know the content."	"I know some of the content but I'm still learning parts of it."	"I know some of the content but I don't really understand it thoroughly."	"I've seen the content but I don't know enough to do anything."	"I don't know the content."

RUBRIC GRADING IN GEOMETRY

SCORE	Explanation of the Score:	What I want you to learn from the score:
A	Calculations & Reasoning are correct. The solution is complete.	I know the topic.
B	Calculations are correct but Reasoning is incomplete. Or, minor calculation errors with correct reasoning.	I know the topic but I made a minor mistake or omission.
C	Minor Calculation errors and incomplete Reasoning. Or, significant Calculation or Reasoning error.	I know some parts of the topic but I'm still learning parts of it.
D	Major error(s) are present. Calculations and Reasoning are incomplete and incorrect.	I don't really understand the topic thoroughly enough.
F	No significant attempt was made to provide a solution.	I've seen the topic but I don't know enough to do anything.

RUBRIC GRADING IN CALCULUS

A	B	C	D	F
Calculus, algebra & arithmetic is correct.	Calculus is mostly correct ; algebra / arithmetic errors.	Minor Calculus error(s) present.	Major Calculus error(s) present.	No significant attempt was made.
"I know the content."	"I know most of the content but made a few errors."	"I know some of the content but I don't understand thoroughly."	"I've seen the content but I don't know enough to do anything."	"I don't know the content."

RUBRIC GRADING IN STATISTICS

A - Mastery	B - Progressing	C - Developing	D - Beginning	F - No evidence
Statistical Reasoning is correct. Solution is appropriate & complete.	Statistical Reasoning is mostly correct. Minor procedural errors or incomplete explanation.	Statistical error(s) present. Incorrect/incomplete solution but reasonable foundation.	Major Statistical error(s) present. Solution is incomplete and incorrect.	No significant attempt was made.
"I know the content."	"I know some of the content but have a few gaps."	"I know some of the content but I don't understand thoroughly."	"I've seen the content but I don't know enough to do anything."	"I don't know the content."

LET'S DO SOME GRADING

- Side A
 - Score each question using the rubric
 - Think about the quality of the work
- Side B – one quiz with two standards
 - Score each standard
 - Think about the quality of the work on all questions that address the standard

LET'S DO SOME GRADING

Score:	A	B	C	D	F
Explanation of score:	Algebra & Arithmetic is correct. The solution is complete.	Algebra is correct. Possible minor Arithmetic errors in the solution.	Minor Algebra error(s) present. Solution is incomplete but correct.	Major Algebra error(s) present. Solution is incomplete and incorrect.	Almost no attempt was made to provide a solution.
What I want you to learn from the score:	"I know the content."	"I know some of the content but I'm still learning parts of it."	"I know some of the content but I don't really understand it thoroughly."	"I've seen the content but I don't know enough to do anything."	"I don't know the content."

CALIBRATE & DEBRIEF

Solving Linear Equations:

1. Solve: $5(x-3)=8$

$$5x - 15 = 8$$
$$\underline{+15}$$

$$5x = 8$$

$$\frac{5x}{5} = \frac{8}{5}$$

$$x = \frac{8}{5}$$

CALIBRATE & DEBRIEF

Slope:

2. Calculate the slope of a line that passes through $(-4,5)$ and $(8,2)$.

$$m = \frac{2-5}{8-(-4)}$$

$$= \frac{3}{12}$$

$$= \frac{1}{4}$$

CALIBRATE & DEBRIEF

Solving a System by Elimination:

$$3. \quad \begin{cases} 4x - 3y = 12 \\ 2x - y = 2 \end{cases}$$

$$\begin{aligned} 4x - 3y &= 12 \rightarrow 4x - 3y = 12 \\ -3(2x - y &= 2) \rightarrow \frac{-6x + 3y = -6}{-2x = 6} \\ x &= -3 \end{aligned}$$

$$\begin{aligned} 2(-3) - y &= 2 \\ -6 - y &= 2 \\ -y &= 8 \\ y &= -8 \end{aligned}$$

$$(3, -8)$$

CALIBRATE & DEBRIEF

Solving a System by Substitution:

$$4. \quad \begin{cases} 4x - y = 9 \\ y = -2x + 1 \end{cases}$$

$$4x - y = 9$$

$$4x - (-2x + 1) = 9$$

$$4x + 2x + 1 = 9$$

$$6x + 1 = 9$$

$$6x = 8$$

$$x = \frac{8}{6} = \frac{4}{3}$$

$$\begin{aligned} y &= -2\left(\frac{4}{3}\right) + 1 \\ y &= -\frac{8}{3} + 1 \\ y &= -\frac{5}{3} \end{aligned}$$

$$\left(\frac{4}{3}, -\frac{5}{3}\right)$$

CALIBRATE & DEBRIEF

Solve each equation by factoring.

1. $5x^2 - 16x + 3 = 0$

$$(5x+1)(x+3) = 0$$

$$\left. \begin{array}{l} 5x+1=0 \\ 5x=-1 \\ x=-\frac{1}{5} \end{array} \right\} \begin{array}{l} x+3=0 \\ x=-3 \end{array}$$

2. $\frac{4x^2}{4} = \frac{25}{4}$

$$x^2 = \frac{25}{4}$$

$$\sqrt{x^2} = \pm \sqrt{\frac{25}{4}}$$

$$x = \pm \frac{5}{2}$$

CALIBRATE & DEBRIEF

Solve each equation by completing the square.

3. $x^2 - 18x = -9$

$$\left(\frac{-18}{2}\right)^2 = 81$$

$$x^2 - 18x + 81 = -9$$

$$(x-9)^2 = -9$$

$$x-9 = \pm\sqrt{-9}$$

$$x-9 = \pm 3i$$

$$x = 9 \pm 3i$$

4. $x^2 + 40x + 40 = 0$

$$\left(\frac{40}{2}\right)^2 = 400$$

$$x^2 + 40x = -40$$

$$x^2 + 40x + 400 = -40 + 400$$

$$(x+20)^2 = 360$$

$$\begin{array}{r} 360 \\ \swarrow \searrow \\ 36 \quad 10 \end{array}$$

$$x+20 = \sqrt{360}$$

$$x+20 = 6\sqrt{10}$$

$$x = -20 + 6\sqrt{10}$$

WHAT DID WE NOTICE?

Rewards

- Quality feedback leading to better conversations
- Students engage in more focused relearning
- Grades reflect what students know

Challenges

- Student buy-in and school culture
- Explaining the grading process to parents
- Creating Assessments

TIPS FOR GETTING STARTED

- Talk about topics instead of textbook sections
- Focus assessment on one or two standards
- Give more qualitative feedback
- Work with a colleague
- Don't fear the rubric
- Start small

WHAT RESOURCES GUIDED US?

- Rodney Stutzman & Kimberly Race
 - “EMRF: Everyday Rubric Grading” - Mathematics Teacher, January 2004
- Cathy Vatterott
 - *Rethinking Grading*
- Shawn Cornally
 - <http://shawncornally.com/wordpress/>
- Dan Meyer
 - blog.mrmeyer.com

WHAT ARE YOUR QUESTIONS?

Contact us:

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