MASTERY BASED
GRADING

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Mastery Based Grading

AGENDA

What's wrong with traditional grading?
Ken O'Connor – A Repair Kit for Grading

Practices and beliefs about grading, what's the process to change?
Tim Westerberg – Charting a Course to Standards-Based Grading

Is systemic reform even possible in today’s schools?
Lindsay Unified School District – Beyond Reform: Systemic Shifts Toward Personalized Learning

Getting students to mastery – is mastery learning the game changer?
Bloom and others' perspectives on Mastery Learning.

AERIES Teacher Portal / Gradebook
Resources and Recommendations for Mastery Learning

Instructional Resources and Research
Robert J. Marzano – The New Art and Science of Teaching

Aeries TEACHER RESOURCE AREA.

Questions? Comments? Let the dialogue begin.
Grading Resources

A Repair Kit for Grading

Fixes for Practices that Distort Achievement:

**FIX 1**
Don’t include student behaviors (effort, participation, adherence to class rules, etc.) in grades; include only achievement.

**FIX 2**
Don’t reduce marks on “work” submitted late; provide support for the learner.

**FIX 3**
Don’t give points for extra credit or use bonus points; seek only achievement that more work has resulted in a higher level of achievement.

**FIX 4**
Don’t punish academic dishonesty with reduced grades; apply other consequences and reassess to determine actual level of achievement.

**FIX 5**
Don’t consider attendance in grade determination; report absences separately.

**FIX 6**
Don’t include group scores in grades; use only individual achievement evidence.

From O’Connor (2013) Figure 1.1 The 15 Fixes, p. 13. Underlines not in original text.

Fixes for Low-Quality or Poorly Organized Evidence:

**FIX 7**
Don't organize information in grading records by assessment methods or simply summarize into a single grade; organize and report evidence by standards/learning goals.

**FIX 8**
Don’t assign grades using inappropriate or unclear performance standards; provide clear descriptions of achievement expectations.

**FIX 9**
Don’t assign grades based on student’s achievement compared to other students; compare each student’s performance to preset standards.

**FIX 10**
Don’t rely on evidence gathered using assessments that fail to meet standards of quality; rely only on quality assessments.

From O’Connor (2013) Figure 1.1 The 15 Fixes, p. 13. Underlines not in original text.

Fixes for Inappropriate Grade Calculation:

**FIX 11**
Don’t rely only on the mean; consider other measures of central tendency and use professional judgment.

**FIX 12**
Don’t include zeros in grade determination when evidence is missing or as punishment; use alternatives, such as reassessing to determine real achievement, or use “I” for Incomplete or Insufficient Evidence.

Fixes for Inappropriate Grade Calculation:

**FIX 13**
Don’t use information from formative assessments and practice to determine grades; use only summative evidence.

**FIX 14**
Don’t summarize evidence accumulated over time when learning is developmental and will grow with time and repeated opportunities; in those instances, emphasize more recent achievement.

**FIX 15**
Don’t leave students out of the grading process. Involve students; they can – and should – play key roles in assessment and grading that promote achievement.

From O’Connor (2013) Figure 1.1 The 15 Fixes, p. 13. Underlines not in original text.

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Charting a Course to Standards-Based Grading

Westberg’s 4 DESTINATIONS

• Counterproductive Assessment/Grading Practices & Beliefs
  • Effects of the ZERO
  • Extra Credit
  • Academic vs Work Ethic/Citizenship
  • Averaging vs Trend Scoring
  • Late Work
  • Subjective Grading

• Assessment/Grading for a Guaranteed & Viable Curriculum
  • Organizational Shared Vision/Framework
  • Effective Teaching in Every Classroom
  • Standards, Scoring Scales & Instructional Alignment
  • Standards-Based Units of Instruction
  • Logistics of Sustained Change

• Standards-Based Grading and Reporting
  • Implications for Gradebooks & Reporting
  • Implementing a Multi-year Transition Plan
  • Community Engagement

Grading Resources

Charting a Course to Standards-Based Grading

Westberg’s 4 DESTINATIONS (Continued)

• Standards-Based Grading

Competency-Based Education & Personalized Learning

• All students held to clearly defined goals and high expectations
• Students advancing at their own pace
• Ongoing assessment and feedback
• Student awareness of current level of performance and academic gaps
• Varied learning experiences

## Mastery Based Grading

### SBG / Mastery Scoring Scale Template**

<table>
<thead>
<tr>
<th>Score</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.0</td>
<td>In addition to Score 3.0 performance, in-depth inferences and applications that go beyond what was taught</td>
</tr>
<tr>
<td>3.5</td>
<td>In addition to Score 3.0 performance, partial success at inferences and applications that go beyond what was taught</td>
</tr>
<tr>
<td>3.0</td>
<td>No major errors or omissions regarding any of the information and/or processes (simple or complex) that were explicitly taught</td>
</tr>
<tr>
<td>2.5</td>
<td>No major errors or omissions regarding the simpler details and process and partial knowledge of the more complex ideas and processes</td>
</tr>
<tr>
<td>2.0</td>
<td>No major errors or omissions regarding the simpler details and processes but major errors or omissions regarding the more complex ideas and processes</td>
</tr>
<tr>
<td>1.5</td>
<td>Partial knowledge of the simpler details and processes but major errors or omissions regarding the more complex ideas and procedures</td>
</tr>
<tr>
<td>1.0</td>
<td>With help, a partial understanding of some of the simpler details and processes and some of the more complex ideas and processes</td>
</tr>
<tr>
<td>0.5</td>
<td>With help, a partial understanding of some of the simpler details and processes but not the more complex ideas and processes</td>
</tr>
<tr>
<td>0.0</td>
<td>Even with help, no understanding or skill demonstrated</td>
</tr>
</tbody>
</table>

**NOTE:** This sample scoring template is generic; it does not describe the rubric detailing specific knowledge and skills that would be included for a specific curriculum or unit of instruction.

From Classroom Assessment & Grading That Work (p. 50) by Robert J. Marzano, 2006, Alexandria, VA: ASCD.

Cited in Charting a Course to Standards-based grading (p.64) by Tim E. Westberg, 2016, Alexandria, VA: Association for Supervision and Curriculum.

See for example: Using Common Core Standards To Enhance Classroom Instruction & Assessment by Robert J. Marzano, et. al.,2013, Bloomington, IN: Marzano Research Laboratory.
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Strategic Change Resources

Systemic Reform – Personalized Learning

This new resource published by Marzano Research, details the systemic changes made in the Lindsay Unified School District.

"Many districts have experienced difficulty meeting the needs of increasingly diverse student populations and preparing graduates for post secondary education and the 21st century workforce. Lindsay Unified School District set out to meet this challenge by shifting from a traditional time-based education system, in which students are expected to conform to a one-size-fits-all pace, to a performance-based model titled as the Performance Based System in Lindsay Unified, in which learners progress only when they have demonstrated mastery."

LUSD strategic design (2007) is available on their website: http://www.lindsay.k12.ca.us/filelibrary/LUSD%20Strategic%20Design%20201.pdf


Lindsay’s Performance Based System focuses on mastery in the context of a guaranteed and viable curriculum:

- **Guaranteed**: all learners master competencies in identified curriculum.
- **Viable**: curriculum focuses only on essential learning outcomes.

Based on *Classroom Instruction That Works*, learning goals & rubrics define mastery at the core of the learning process, creating a mastery mindset in a results driven culture.

“They cannot progress to the next level in a content area until they have successfully demonstrated understanding or skill in a required proficiency.”

“The district would no longer award barely passing grades so learners could move forward without having mastered the required content or skills, nor would the district advance learners based on compliance, good behavior, or seat time.”

Lindsay’s mastery mindset requires learning facilitators to:

“skillfully integrate multiple opportunities for learners to demonstrate mastery through the use of formative assessment, digital learning tools, performance-based assessment, presentations, and peer-to-peer instruction.”

From Lindsay USD (2017), pp. 31-32. Underlines not in original text.

Strategic Change Resources

Systemic Reform – A Mastery Mindset

Lindsay USD Scoring Scale: Academic Learning

4.0 The learner knows all of the simple knowledge and skills and all of the complex knowledge and skills, and goes beyond what was taught in class to apply the knowledge.

3.5 The learner knows all of the simple knowledge and skills and all of the complex knowledge and skills, and can make in-depth inferences and applications with partial success.

3.0 The learner knows all of the simple knowledge and skills and all of the complex knowledge and skills.

2.5 The learner knows all of the simple knowledge and skills and some of the complex knowledge and skills.

2.0 The learner knows all of the simple knowledge and skills.

1.5 The learner knows some of the simple knowledge and skills and some of the complex knowledge and skills.

1.0 With help, the learner knows some of the simple and complex knowledge and skills.

Marzano Research has analyzed the factors that lead to High Reliability Schools. A hierarchy of these factors is listed below.

**Levels of Operation for a High Reliability School**

- **Level 5**  Competency-Based Education
- **Level 4**  Standards-Referenced Reporting
- **Level 3**  Guaranteed and Viable Curriculum
- **Level 2**  Effective Teaching in Every Classroom
- **Level 1**  Safe and Collaborative Culture

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Although the concepts of Mastery Learning stretch back to the 1960's recent articles have focused on the topic.

What is Mastery Learning?

“It is an instructional philosophy based on the idea of setting clear objectives, providing students with opportunities for practice, checking for understanding, re-teaching in different and new ways if needed, and finally, giving students more than one chance to demonstrate the attainment of the goal.”

Grant Wiggins comments on standards and mastery.

“Bloom nowhere defined mastery; he only proposed that we set ‘absolute,’ criterion-referenced standards at the local level.”

“I proposed the following definition to advance the discussion: Mastery is effective transfer of learning in authentic and worthy performance. Students have mastered a subject when they are fluent, even creative, in using their knowledge, skills, and understanding in key performance challenges and contexts at the heart of that subject, as measured against valid and high standards.”

“Mastery must be tested using authentic tasks and scenarios at the heart of “doing” the subject. And instruction for mastery must be designed backward from these cornerstone tasks.”

“Every teacher who grades students makes decisions about what level of performance is “good enough.” Yet, in my work over decades, I have found that most teachers merely come up with an algorithm for calculating grades rather than ensuring that their grades link to larger, defensible standards. The fact that such norm-referenced, individualistic grading is a time-honored educational custom fails to justify it.”

Thomas Guskey & Eric Anderman focus on distinguishing characteristics of mastery versus competence.

“If “grades or marks are criterion-based and designate distinct levels of student achievement, then teachers have already identified mastery.”

The affective realm is also involved in mastery research. “Motivation researchers also find that teachers’ classroom practices can facilitate students’ adoption of mastery goals. Students adopt mastery goals when teachers (1) allow them to resubmit assignments that need more work; (2) do not pressure students by consistently talking about grades and assessments; and (3) encourage self-comparisons and avoid comparing students’ achievement with that of other students.”

Implications for practice include: making “sure students understand the goal and must clearly articulate to students what constitutes mastery” and “teachers must emphasize that the goal is mastering the task, rather than simply getting a grade.”

Grading Resources

*Recent Articles: Flipping for mastery*

Thomas Bergmann & Aaron Sams describe practical strategies for teaching for mastery in a “flipped classroom” setting where much of the direct instruction can take place outside class-time using a variety of resources. They describe their strategy as “the flipped-mastery model of education.”

“[W]e believe that learning should be the constant and time, the variable.” To achieve this, allowing students to progress at different paces, they rely on several strategies:

- Alternative delivery of direct instruction -- online
- Use of a computerized LMS
- Creation of multiple assessment versions
- Organizing (essential content) units, detailing:
  - Learning Objectives
  - Learning Objects (videos, chapters, worksheets)
  - Required Activities

“Philosophically, we gravitated toward standards-based grading, but we lived in a community that understood and valued letter grades. So we tackled grading in two ways, creating a system for both formative and summative assessments.” The goal is mastering the task, rather than simply getting a grade.

Grading Resources

Recent Articles: Simple is not easy

In the column Research Says, Bryan Goodwin & Kirsten Miller ask the question: “If we have so much evidence to support mastery learning, why don’t we use it more?”

Mastery Learning is a simple idea, Isn’t it?

“…Bloom advanced a simple idea: to apply the key elements of one-on-one tutoring, shown to be the most effective teaching technique we know, to whole-class settings.”

But the dilemma is…

“…how to focus additional support on struggling students while still challenging high performers. As commonly conceived, mastery learning engages high achievers in enrichment activities while struggling students receive remedial support.”

Why hasn’t the practice spread?

Clearly, “the practice appears to be far from commonplace in classrooms.” “[I]t’s far from easy to implement.” “[T]here are technical challenges, such as the need to develop or adopt a robust battery of formative assessments and then to develop remedial interventions linked to these formative assessments.” Mastery Learning “although simple to propose, is not necessarily easy to implement.”

Mastery Learning

Bloom’s Mastery Learning Instructional Process

The 2 sigma problem

• Bloom wanted to learn if researchers and teachers could devise teaching-learning conditions that would enable the majority of students under a group instruction model to attain levels of achievement that could be reached only under good tutoring conditions.

• The basis for mastery discussion is the 1968 article “Learning for Mastery” by Benjamin S. Bloom. “Bloom theorized that nearly all students could attain mastery of any learning task if they were provided with enough time and ‘favorable learning conditions.’”

• Bloom explored three learning conditions:
  • Conventional (30 students, direct instruction, tests used for student marks)
  • Mastery Learning (similar conditions but with formative assessments for feedback purposes to determine which students have mastered subject matter).
  • Tutoring (continuous feedback and individualized learning)
Mastery Learning

Lessons of Mastery Learning

How Mastery Learning Works

• Bloom researched how to adapt the most powerful aspects of tutoring/individualized instruction to improve student learning in general education classrooms.

• Units of instruction are devised for a curriculum with clear, specific learning expectations.

• Formative assessments are used to pre-assess, continuously assess, and provide feedback during the instructional unit.

• Students who are still developing skills are provided corrective, remedial, targeted activities.

• Enrichment or extension activities are offered to students who demonstrate their proficiency.

Mastery Learning

Lessons of Mastery Learning

How Mastery Learning Works (continued)

• Pre-assessment and pre-teaching activities provide gap-analysis and teaching targets.

• High quality, group-based initial instruction is followed by additional instruction based on thorough, regular formative assessments.

• Specific corrective instruction is designed to remedy learning gaps, problems identified by formative assessments.

• Corrective instruction is more than “re-teaching;” it can include individual assistance, instructional alternatives to support differentiated learning styles or modalities.

• Subsequent formative assessments should not be “one-shot” activities; students should have the opportunity to demonstrate mastery on any portion of the learning goal.

How Mastery Learning Works (continued)

• Enrichment or extension activities should be much more than “busy-work” and may include special projects, deeper thinking about or application of learned skills.

• Peer-tutoring may be a valuable enrichment activity.

• Whether corrective or enrichment, all learning activities should be valuable.

• Focus on higher level thinking skills and depth of knowledge dimensions should be incorporated throughout the instructional process.

Mastery Learning

Lessons of Mastery Learning

Powerful Formative Classroom Assessment

• Well-designed formative assessments can provide students with critical feedback and inform teachers about the quality of their teaching.

• Well planned corrective activities do 3 things:
  • Present the concepts differently
  • Engage students differently in learning
  • Create successful learning experiences

• Types of corrective activities can be grouped 3 ways:
  • Things to be done with the teacher (re-teaching, individual tutoring, alternative texts, workbooks, etc.)
  • Things that can be done with a friend (peer tutoring, cooperative teams, etc.)
  • Things to be done by oneself (textbook/worksheet work, learning kits, computer activities, etc.)

Mastery Learning

Lessons of Mastery Learning

Powerful Formative Classroom Assessment (continued)

- Guskey lists several potential corrective activities:
  - Reteaching
  - Individual Tutoring
  - Peer Tutoring
  - Cooperative Teams
  - Course Textbooks
  - Alternative Textbooks
  - Workbooks and Study Guides
  - Academic Games
  - Learning Kits
  - Learning Centers and Laboratories
  - Computer Activities

- Planning for Enrichment activities must be valuable, challenging, and rewarding learning experiences.
  - Related to the learning topic
  - Provide some degree of choice
  - Focus on deeper thinking

Mastery Learning

Final Thoughts on Formative Assessment & Mastery Learning

• Guskey reported Bloom’s research findings:

  • Teachers using little variation of instructional practices in the traditional classroom, usually results in a grade distribution that separates students’ levels of learning. The traditional classroom grade distribution usually results in a bell curve, grades ranging from F to A.

  • To reduce grade variation, Bloom concluded that an increase in teacher instructional variation could reduce the grade variation.

  • Bloom’s Mastery Learning strategy focused on creating instructional units with clear, specific learning goals, regularly assessed by the classroom teacher to provide feedback and prescribe individualized corrective or enrichment activities.

Mastery Learning

Final Thoughts on Formative Assessment & Mastery Learning (continued)

• Guskey reported Bloom’s research findings:

  • With the focus on student outcomes facilitated by the feedback strategy, instructional alignment became critical. Learning Goals/Standards drove instruction; instructional feedback led to correctives, and subsequent assessment provided evaluation of learners’ proficiency or competence in each unit of instruction.

  • Some early work with the Mastery Learning model was too narrow; more recent work, including current SBE goals creation, must include higher level thinking skills, meta-cognition and depth of knowledge dimensions.

  • Summarizing meta-analyses: “few educational treatments of any sort were consistently associated with the achievement effects as large as those produced by mastery learning…In evaluation after evaluation, mastery programs have produced impressive gains.”

### Mastery Learning

**Bloom’s Mastery Learning Process**

<table>
<thead>
<tr>
<th>UNIT 1</th>
<th>Formative Assessment A</th>
<th>Enrichment / Corrective Activities</th>
<th>Formative Assessment B</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Student Outcomes, (what a student will know and be able to do), are developed and shared with students.</td>
<td>• As part of the instructional process, Assessment(s) establish levels of prior and developing skills and knowledge.</td>
<td>• During instruction, teacher uses formative assessments and other measures to gauge student performance.</td>
<td>• Formative assessment activities are used to assess student performance levels.</td>
</tr>
<tr>
<td>• Instructional materials are aligned with Learning Outcomes.</td>
<td>• Instruction is monitored to provide learner-specific activities and pace to ensure mastery learning of content.</td>
<td>• Enrichment activities for students proficient in learning goal</td>
<td>• Multiple opportunities are given to students who still need to show proficiency on learning outcome.</td>
</tr>
<tr>
<td>• Scoring rubrics are created with clearly defined learning levels.</td>
<td></td>
<td>• Remediation for students still building skills and knowledge</td>
<td>• Teacher prepares for next learning unit(s).</td>
</tr>
</tbody>
</table>
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Marzano’s research-based instructional model has been updated, expanded, and revised; the model now takes a student-outcome perspective rather than a teacher-outcomes perspective. The model is divided into three major areas:

- **Feedback** (clear learning goals, aligned assessments)
- **Content** (instructional strategies)
- **Context** (engagement, communication, procedures)

The model identifies 43 categories of instructional elements, each with multiple strategies.

Several elements focus on mastery learning topics.

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Element 1: Providing Scales and Rubrics

- Suggested Scale 0.0 through 4.0
- Midpoint scores are recommended
- 3.0 score denotes proficiency/mastery of simple/complex skills or information that was explicitly taught
- 2.0 score describes understanding of simpler details and processes of what was taught
- 1.0 score reflects partial understanding of some of the simpler details and processes
- 0.0 score used for situations where even with help the student demonstrates no understanding or skill
- 4.0 score demonstrates student’s inferences/applications beyond what was taught

Element 1: Providing Scales and Rubrics - Strategies

- Teacher clarifies learning goals (At the end of the instruction/unit the student will be able to…)
- Learning Goals articulated on proficiency scale
- Teacher uses routines to enable students to understand scales and learning targets
- Teacher uses scales and learning targets as the basis for instruction
- Teacher asks students to translate/explain scales in student-friendly language
- Teacher asks students to identify and articulate a personal learning goal

Element 2: Tracking Student Progress

- Teacher provides students with a clear sense of where they started relative to the topic
- Teachers help students chart their progress using proficiency scale scores
- Formative scores are used throughout the unit to monitor student progress
- Teacher develops items or tasks directly related to content in levels 2.0, 3.0 and 4.0 of the scale.
- Teacher utilizes formative assessments to evaluate only one level (e.g. 2.0) of the scale
- Teacher uses different types of assessments
- Teacher uses various methods to generate summative scores on the topic taught
- Student and teacher chart student progress, ultimately resulting in a summative score on the scale
- Teacher tracks entire class progress showing percentage of students scoring at proficient 3.0 level

Instructional Resources

Mastery Learning Elements

Element 3: Celebrating Success

• Teacher celebrates each student’s success at any point in time
• Teacher celebrates knowledge gain, the difference between the student’s initial and final scores
• Teachers provide verbal feedback of the student’s effort and growth, explaining what the student did well

Element 4: Using Informal Assessments of Whole Class

• Teacher asks students to rate how confident they are in understanding a topic
• Teacher asks students to vote on answers
• Teacher asks students to write responses on erasable board or cards
• Teacher occasionally uses unrecorded assessments immediately scored by students to provide feedback

Element 5: Using Formal Assessments-Individual Students

- Teachers work together with other teachers of the same content to create common assessments to provide both formative and summative assessments
- Teacher creates and scores traditional assessments of selected-response and short answer questions
- Teacher asks students to create presentations that demonstrate understanding of the topic
- Teacher interviews students regarding a specific topic, assigning scores depicting the student’s knowledge
- Teacher observes students interacting with the content and assigns scores depicting student knowledge
- Teacher invites students to devise ways they can demonstrate their competence on a topic
- Teacher identifies response patterns at scores 2.0, 3.0, and 4.0 (rather than adding points) to create overall assessment score

Marzano details eight systemic changes that naturally flow from the changes implied in *The Art and Science of Teaching*:

1. Ensure Teacher Development
2. Focus on Unit Planning not Lesson Planning
3. Use Blended Instruction
4. Ensure a Guaranteed & Viable Curriculum involving Cognitive & Meta-cognitive Skills
5. **Rely on Classroom Measurement**
6. **Change Report Cards**
7. Adjust Scheduling to Address Differential Effectiveness of Teachers
8. Move to a Competency-Based System, Gradually

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Recommendation 5: Rely on Classroom Measurement

• Focus on measurement rather than tests
• Use classroom assessments to measure student growth
  • Rationale 1: end-of-course or benchmark assessments are too infrequent
  • Rationale 2: lack of frequency puts too much emphasis on these single assessments
  • Rationale 3: because of test reliability, confidence levels of true score are problematic
  • Rationale 4: using only benchmarks ignores rich classroom assessment data
• Proficiency scale scores can be tracked to assess student’s summative final score
  • Avoid using averaging
  • Select trend option: linear with time value

Recommendation 6:
Change Report Cards

- Use standards-referenced report card
- Include student status and growth
- Report summative proficiency score on each major standard; translate to letter grade if necessary
- Report details of standards showing summative assessment scores, detailing first and final scores
- Report trend results for each detail of standards
- Combine details of standards by average or trend

- If letter grades are required, consider conversion:
  - 3.00 – 4.00  A’s
  - 2.50 – 2.99  B’s
  - 2.00 – 2.49  C’s
  - 1.00 – 1.99  D’s
  - Below 1.00  F

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Session 168