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Communicating Student Achievement Through Standards-Based Assessment And Grading

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COMMUNICATING STUDENT ACHIEVEMENT THROUGH STANDARDS-BASED ASSESSMENT AND GRADING

by

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To my students past, present, and future, for their dedication to learning, but more importantly, for teaching me to never stop wanting to learn.

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Introduction: What Do Grades Mean?

On the first day of school the bell rang and new sixth grade students flooded my math class. A young, quirky girl approached me and confidently stated, “math is easy for me. I always get As.” At first, I patted her shoulder, told her she was a “smart cookie,” and asked her to take her seat. As the year went on, I continued to think from time to time about what the girl had said. From what I could see, just months into the school year, math was actually a difficult area for this girl. She worked very hard, tried her best on every task, but struggled to understand the content and concepts without direct support. Seeing this girl fail to meet the basic criteria for the grade-level concepts I was teaching, yet believing she was "good" at math because her last teacher gave her an "A," led me to very intentionally reflect on my own methods of grading, asking: which method of grading is the most effective way to communicate a student's progress and growth through the course of a school year to students, parents, and future teachers?

In this chapter, I will discuss my rationale and desire to discover the fairest method of grading, as well as the relevance of this topic in today’s classroom and schools. My passion for equity in the classroom stems from personal observations and experiences with assessments and grading having an overwhelming influence on a student and his or her future. Teachers hold a certain power when assigning grades. When assessing what a student comprehends, and such power should be used to support the

students' growth, and I believe the method in doing so should be proven effective. Communicating what a grade means is critical in having an effect, either positive or negative, on a student's understanding of how he or she is performing. Common language between students, teachers, and parents can be challenging, but is necessary to provide the most equitable and successful education, as I will note and continue to discover throughout this chapter.

Rationale: A True Story

My younger brother is one of the most insightful and meaningful thinkers I know. He scored just below genius level on several IQ tests as a child, he could read by the time he was three, and yet, he barely graduated from high school. His teachers often commented, "he would do so well if he gave more effort" or "he's a smart kid, except he's always off-task." His high school report card comments read, "he would have passed if he was more organized." My brother does not have a college degree in part because his grades were not strong enough to get into a school without attending a community college first, which he tried for several years. Additionally, he was fortunate enough to find a job he loved and has been excelling ever since. Although he is successful and happy with the life he is living, I often wonder what might have been had his grades reflected his true academic ability, rather than behavior, organization skills, or personal opinions of the teacher. As an educator I believe life-lessons, social skills, and responsibility are a large part of a young person's development, and necessary for future success. However, those skills and behaviors should not be included in academic grading.

My brother is a talented writer and a gifted, and articulate speaker, but he received failing grades in both English and Speech.

I believe the reasons for my brother's lack of academic success were because his grades were unfairly given as a result of non-standard factors contributing to the total grading criteria in the classroom. Had my brother's teachers used Standards-Based Grading (SBG), they may have seen a direct correlation between his skills in the classroom and the scores of his standardized test, rather than calling him a "good test taker" or "lucky," as currently documented in his high school transcripts.

Context: Why Does Grading Style Matter to Me?

Recently, my school has taken on the challenge of learning, researching, and planning to adopt a standards-based grading system from kindergarten through fifth grade. Grading systems have been a topic covered in many staff development trainings and professional learning communities (PLCs) across the nation (Baker, 2013). Personally, I have enjoyed seeing the natural connection between the standards-based instruction and the corresponding grades. However, I also believe our school originally made the switch, along with many other districts, following the trend of a new wave of grading. Many teachers, including myself, feel SBG has had a great influence on the way we talk about our students' learning and the way we plan our instruction. Students who are familiar with the standards, and the learning progression to reach mastery for each of those standards, are then also able to communicate on their own the level of their success. More specifically, students are able to communicate what areas they feel they need further support to reach their full potential. However, we have not spent much time

reflecting on what has become more difficult or what may not be working as well as traditional grading.

Context: Why Does Grading Style Matter to Others?

Many of my colleagues who teach at the high school level argue that by using SBG, we are ignoring the importance of college readiness. They feel that by not grading the responsibility or effort of the students, we are not teaching them that in life there are deadlines, academic expectations, and specific tasks that need to be completed within certain guidelines. Another concern among my colleagues is the fluidity in the transition between SBG and the 4.0 scale used in our high school and most colleges and universities. The high school teachers have had a difficult time getting on board with a grading system that does not easily translate into the traditional 4.0 scale colleges use for entrance applications and scholarships. These concerns are valid, and paired with my own thoughts, both for and against SBG, I have to reflect on my grading practices in order to truly be confident in my methods.

When I first started using SBG in my classroom I knew receiving an "A" meant the student was mastering the sixth-grade state mathematical standards at a rate of 90 percent or higher. As one of the few teachers who had begun implementing SBG, I was unable to identify what an "A" meant in another teacher's classroom on my own, specifically what it meant for the young student in the previous years' math courses. My questioning led to more research. Using the Minnesota Comprehensive Assessment (MCA) scores from the spring of the previous year, I assessed the mastery of my "I'm good at Math" student from the first day. The student scored a 548, which according to

the state meant, she was "partially meeting" state standards of the fifth-grade math content benchmarks. The student had received an A in math on her fifth-grade report card, but was only partially proficient in the standards to be mastered by the end of the year. After checking grades and test scores of several other students, I found a similar pattern. The discrepancies in the grades and test scores led me to further investigate the validity of each score, and what we as teachers are communicating with the use of the SBG system.

My district continues to dig into the research-based practices and teachings of Dr. Robert Marzano, as part of our school's adoption of a mandated Teacher Development and Evaluation Model. Through our studying, many of the teachers in our district have begun adapting pieces of Marzano's teaching philosophies and techniques, including standards-based instruction and grading. For me, the idea of SBG has always been appealing, and I have been modifying my grading system during the last two school years to better fit Marzano's model. Part of my personal practice has always been reflection and modification based on data, which makes SBG a natural progression in my teaching.

My colleagues have often challenged me and asked, "how do you give the same grade to a student who works really hard and turns in beautifully done work and a to student who rarely finishes a messy assignment on time?" My response includes posing the questions "what we are measuring when we grade our students? Can effort be measured?" It is my belief that it cannot, simply because each student's effort can vary from day to day, subject to subject, assignment to assignment. Although I find it informative for the teacher to know whether or not a student has to put in extra time and

energy on a certain concept or assignment, I will not consider it to be a measure of his or her mastery of the content. However, effort, neatness, attention to detail and deadlines, and other subjective assessments are able to be measured using rubrics and scales, in order to be documented in a separate section on report cards to continue communication of academic and behavior expectations to students and guardians.

To prove my thoughts, I refer back to the original scenario given by my colleague. What if a student does really well on an assignment, conceptually, but did not take much time to complete it? Perhaps it was not rigorous enough for that particular student's ability. Would you lower his/her grade because it took him/her less time to complete? What about a test? Students are not asked to report how long they studied prior to taking the test, but they are all graded on the same 100% scale. While other colleagues teaching at the high school level worry that SBG will take away from "college readiness" skills such as deadlines, grit, and study skills, it is my understanding that SBG does not mean to eliminate the evaluation of those skills, rather remove them from being intertwined and considered with the academic content scores.

Why Does Grading Style Matter to Parents?

Another common argument I have heard, especially from parents, is "why are you teaching to the test?" This catch phrase, in education, holds a negative connotation. I believe I am teaching to the test, if the test in question is properly written. The state creates standards and benchmarks, which they believe to be the skills and concepts a student needs to master in a specific grade-level and subject area. Those standards are the foundation for what I teach, but not how I teach. The standards outline what the students

must know, and therefore, what they will be tested on at the end of the year, similar to what many college courses are designed for students to do. The use of SBG is not a change in how we teach our students, rather a shift in the way we assess and guide them in improving their knowledge.

Summary

In my initial research, I questioned which method of grading is the most effective way to communicate a student's progress and growth through the course of a school year to students, parents, and future teachers. I have discussed this topic at length with my professional colleagues, current and former students, and reflected on my personal practices. I have considered those who feel SBG and grading is complicated, unfair or impractical. I have also made a plan to further understand the difference between standardized and traditional grading methods.

Thus far, though, it seems in order to help students like my brother, or my enthusiastic math student, reach their full academic potential, true mastery of conceptual skills needs to be measured independently of behavior or social skills. It is my theory that teachers who use standards-based instruction as the foundation of their curriculum, as well as related and correlated assessments, are more likely to see proficient test scores for their students, and therefore have a more accurate representation of student success reflected in the students' grades. Throughout this capstone, I will review literature from published experts, as well as examples of successful and unsuccessful implementation of SBG.

Preview: Literature Review

My literature review will include examples from research that supports and contradicts my personal opinions. I look forward to continuing to research and read what experts in the field of education, assessments, and grading systems say and believe in terms of SBG. This topic is relevant and prevalent in public schools currently, and opinions are being formed and defended regularly. The perspective of students, parents, and teachers all hold value, and need to be considered equally when deciding the most effective method of communicating success.

CHAPTER TWO

Literature Review

Introduction

The practice of standards-based grading (SBG) is a relatively new concept for many school districts. Teachers who question the theory often ask where effort and rigor are depicted in the grading, while those who believe in the method question why behaviors that cannot be measured are graded at all (Wormeli, 2006). These drastically different opinions led to the question of: which method of grading is the most effective way to communicate a student's progress and growth through the course of a school year to students, parents, and future teachers?

In this chapter, the previously recorded and data driven research of educational experts and practitioners will be synthesized and analyzed. The connections between the research question and the literature review will be explained. The history of SBG will be explained and compared to current grading trends. Major factors of SBG, including training philosophies and opportunities, as well as evidence to support the impact of SBG implementation will be reviewed. The positive and negative outcomes that results from using SBG with students who are on individualized educational plans (IEP) will be evaluated. Both those who oppose SBG and those who are in favor of the grading and assessment method will be included, citing connections between the two viewpoints.

Definition

For many years, classroom teachers have assessed students with letter grades ranging from A to F, possibly corresponding to a percentage of combined accumulated points earned in a course from academic work, behavior, and effort (Marzano, 2011). Challenging this traditional style of grading is SBG. With SBG, the learning becomes the focus, where the grade reflects the achievement on standards, while effort and behaviors are recorded separately (Brookhart, 2011).

With SBG, grades are meant to convey the proficiency level of an individual student on particular strands learned within a subject area. In a 2011 article, Brookhart states, "teachers need to begin by asking themselves whether or not they believe grades are not about what students earn, they are about what students learn." This "learn versus earn" theory is a crucial difference between traditional and SBG. Another dividing factor is the lack of comparison between students in SBG. SBG does not compare students and their success to one another, even within the same classroom (Guskey, 2001). Used solely as a tool to measure an individual's success, performance of peers does not impact the grades in the SBG system.

The use of SBG is "very different from what we grew up with," admits Assistant Superintendent of Curriculum and Instruction Ugrich, who works for Centennial Schools in Des Moines, Iowa (Erzen 2013). Ankeny High School, one of the schools in the Centennial district, recently began making the shift to the SBG system. Ugrich stated, "If we didn't get all of the concepts the teacher just moved on, but now we are expected to have rigor for all and not just for some…we have to look at the most recent evidence

from students. It's about growth over time," (Erzen, 2013). As Urich mentioned, SBG is based on the theory of assessing student skills related to the standard, while looking for continued growth throughout the school year.

Being a newer concept, SBG has many interpretations across different school districts, and even within different classrooms in the same district. Dr. Robert Marzano, an expert in educational philosophy and curriculum and assessment, reminds educators "while there is a good deal of agreement about its potential as a tool to enhance student achievement, the specifics of formative assessment are somewhat elusive (2010)."

Schools typically utilize both formative and summative assessments. Formative assessments are done during the learning process, as a frequent "check-in" or measure of current levels of understanding. These assessments are ongoing and inform and guide further instruction. Summative assessments are given to students at the end of the learning and should match objective and experiences from the classroom. They should reflect most of the essential and enduring knowledge (Wormeli, 2006). The SBG system uses only summative assessments for grading purposes, because as stated by Marzano (2012), results of formative assessments can still be easily misinterpreted. This does not mean formative assessments do not serve a purpose in the classroom; however, those assessments should not be included in the grading criteria. Formative assessments are to be used as a progress-monitoring tool in the SBG system.

Another area of the SBG system that is often misunderstood by school districts or teachers is the advancement from one level to another. In true SBG systems, students' report cards would reflect performance to the standards and advancement to the next

level or grade would reflect their mastery pertaining to each standard. Many schools claim to use SBG, but allow students to advance each year without mastery of skills in a specific content area (Marzano, 2010). The use of SBG, including rubrics, learning progressions, and student self-assessments, give both students and teachers a clear vision of how the student is performing, what gains have been made, and what specific areas are still needing to be re-taught or re-assessed (Wormeli, 2006).

The SBG system is meant to rid grading systems of the "omnibus grades" (Marzano, 2010). Grades based on emotion or past success on assessments is a method used by teachers, even without intention. However, the weight a grade holds when based on opinion, rather than standards-based evidence, is significantly less. The discrepancies in various assessment structures may cause a grading system to be flawed. Assessments, regardless of the style used, ultimately leads to grading. In a SBG system, the goal is to connect curriculum to assessments, and correlate assessments to a grade. To achieve this, a teacher may use rubrics and scales within Learning Progressions, to clearly communicate expectations for various levels of success.

For example, a teacher would use the subject-area standards (national, state, or local) to create a lesson, and then create assessments solely based on those same standards. The rubrics would be used to help students self-evaluate their learning, as well as give the teacher specific skills to evaluate for each student. See Appendix A. Comparatively, the traditional grading system is based on an arbitrary point scale, derived from a textbook, curriculum, or teacher's professional opinion.

History of Standards Based Grading and Implementation

In classrooms across the country, students often receive a test or assignment and immediately want to know "What's my grade?" In a 2012 article, Spence states that "grading eventually was used as a sorting mechanism that allowed educators to rank students and establish curves and hierarchies." Spencer describes the use of SBG as a "fairer" way of grading because it does not use factors unrelated to mastery of the skills being taught.

The SBG system began when teachers started to question the goals for their students within a subject area. With clear academic goals, and expectations for proficiency and growth, SBG has been a practice emerging among elementary and secondary schools alike. The practice was suggested when "No Child left Behind" was implemented and continues to be a method studied and suggested across the country (Spencer, 2012). The idea of basing grades and assessment on standards also comes from the reflection done by teachers asking themselves why we grade our students (Chappuis et al., 2012). In both the traditional and SBG systems, teachers use grades to pass on information to the next group of instructors, as well as communicate successes to students and parents. However, in the SBG model, the information is more specific and detailed, and is intended to show ongoing development and growth.

The feedback included with a grade in the SBG system, tied to the Learning Progression, is explicit and connected to the standard being assessed. A Learning Progression is the guide through the standards in order of rigor. The lowest level of the progression includes skills that are considered foundational and would be required to

know prior to moving on to more rigorous content tied to the standard. See Appendices A and B.

The importance of feedback in relation to learning is noted by Wiggins (2012), "Helpful feedback is goal-referenced; tangible and transparent; actionable; user-friendly (specific and personalized); timely; ongoing; and consistent." With SBG, feedback serves as a constant form of communication between teacher and learner, giving the most recent and specific information for future success. In response, to teachers who argue they do not have time for constant feedback for every student argument, Wiggins (2012) states, "feedback does not need to come only from the teacher… Technology is one powerful tool…Peer review is another strategy for managing the load to ensure lots of timely feedback; it's essential, however, to train students to do small-group peer review to high standards…."

Furthermore, the SBG system does not ignore the value of social skills such as responsibility, organization, and proper school behavior. However, the assessment and scoring for such skills related to group activities are not included in the same grade as academic achievements (Chappuis et al., 2012). The SBG system uses multiple grades or scores to reflect the growth and proficiency of each student.

The practice of SBG is rapidly growing (Wormeli, 2011). The theory of grading students based on achievement in specific topics is considered by many educators to be the "most appropriate method of grading," but Marzano cautions teachers. "There is quite a bit of poor practice on top of considerable confusion about its defining characteristics"

(2010). Without proper research and implementation, SBG can lose its validity and grades can be skewed, similarly to traditional grading systems.

Major Factors

When determining the best practice for grading, a teacher must consider what is the most accurate and fair method of assessment and communicating success for all students. Again, Marzano (2010) contributes "all assessments are imprecise to one degree or another" (2010). If an expert in curriculum and grading, such as Marzano, believes all methods of assessment have flaws, how are everyday teachers supposed to choose a style to fit the best practice? Marzano is an advocate for SBG, but clearly states teachers need to be properly trained in the system in order for it to truly be the fairest method of assessment for all students.

Educator Training

Lack of formal training and practice in using grading systems is a common concern in many school districts. The question of fairness in any grading system is subject to teacher interpretation of what is being graded and how the concept is to be mastered. A school in Kentucky started a committee of teachers and researchers to work together to create a plan of implementation for SBG, where all teachers can be trained to use the system in the same way. On committee member indicated, "huge differences exist among teachers in the criteria they use when assigning grades.

Even in schools where established policies offer guidelines for grading, significant variation remains in individual teacher's grading practices (Guskey et al., 2011)." The developers of the committee believe teacher preparation courses do not give

enough time or attention to grading systems. Even with training in various grading systems, teachers who use traditional scales may have trouble connecting a letter grade to a specific standard being taught. Teachers in Los Altos felt the frustrations of lack of training in the fall of 2015, when their school districts made a quick switch to SBG from the traditional A-F scale. "The underlying problem of it all is that we have not done the work necessary to be able to report in a standards-based way," said Laurel McNeil, President of the local Teacher Union. "Teachers have not received enough training to be able to do that (Los Altos Town Crier, 2015)."

The current push towards teaching the standards in every content area requires teachers to create a more direct correlation between the standards being taught and the assessments being administered. If a letter grade is the only result of an assessment, there is little that can be reflected. In a SBG system, the grade should be an indicator to the achievement or mastery level of a specific skill or concept for the individual student. Parents, students, and teachers should be able to make a connection between a grade or score and the standard being assessed. Many schools' grading systems do not speak to the success or proficiency of content area academic standards (Chappuis et al., 2012). Standards should drive instruction and in turn, assessment. Finally, the assessment should connect to the grading system.

Consider this example: Student 1 receives an overall letter grade of a B, however he did not have a proficient understanding of the concept; rather, he was well behaved, organized, and handed in his homework on time each day. Student 2 receives a D in the same course, mainly because he rarely completed his homework, was often tardy to class,

and had several disruptive incidences, though he is able to communicate his understanding of the major objectives in the class. This begs the question, "what does a grade mean?" (Marzano & Heflebower, 2011).

However, when considering only assessments and not social skills such as participation, behavior, and assignment completion (items that may be incorporated in "classwork" scores), Student 2 has a considerably different outcome with SBG (Deddeh et al., 2010). This is not to say the skills included in a classwork or homework grade are not important to the growth of a student, but it does question whether or not one grade embodying all areas of skills is an appropriate and fair reflection of student achievement. It is important to keep in mind that SBG does not eliminate creative thinking or rigor when the method is used correctly.

Using SBG can help a teacher pin-point specific strengths and weaknesses in a student's learning. A student who in consistently demonstrating proficiency in class and is able to continue showing understanding through practice or homework, but struggles on summative assessments, may suffer from anxiety or stress. The issue can be identified much easier, and often quicker, with SBG because the teacher has evidence of understanding from the student, and the poor assessment score would reflect an outside factor affecting the validity of the score.

Evidence to Support Standards Based Methods

The evidence of learning in SBG stems from the continued monitoring for growth in relation to a Learning Progression. A Learning Progression is created by the classroom teacher in direct correlation to the standard or benchmark being assessed. Using

Marzano's 4-point scale of mastery, for example, a teacher would take the desired learning target or goal and place it at a "3," meaning, that specified concept is the goal for each student to master. Considering the level or depth of knowledge required for a student to reach the stated learning target, the Learning Progression is completed by using a "step down" within the taxonomy scale to create a "2" or partial mastery goals, and a "step above" to create the "4" or exceeding mastery goals. See Appendix A. The explicit explanation of each level of mastery is helpful for the teacher, but more so for the student to know what he or she can already do and what he or she needs to continue to work on in order to reach the desired goal. Feedback becomes natural and fluent when referenced in the Learning Progression, and assessments can be written, modified, and graded based on the levels of mastery as well.

Additionally, Learning Progressions allow students to "see" that in order show mastery of a topic, they do not have to take a typical test. The way the Learning Progressions are written, enables students to be creative in how they reach the expectations, and allows for creativity in demonstrating their learned knowledge. If rubrics give students the exact criteria for demonstrating different levels of comprehension and knowledge, when and how are students able to show their creativity or be unique as learners? This question is often used to argue against SBG in schools. However, Rick Wormeli, a National Board-Certified Teacher, public speaker, and author of education-related books, says this question can be answered through using tiered assignments and assessments (2006). Tiering is how teacher adjust assignments and assessments according to students' readiness levels, interests, and learner profiles (2006).

This means, students who are on grade level, students who need more complexity and challenge, and students who are not ready for grade level are all working on the same standard, and the same objective, but would receive differentiated assignments to help them practice the skill at the appropriate academic level.

Assessments can be tiered in the same manner. Wormeli (2006) explains tiered instruction through leveled assignments. Through the tiered assignments, students are able to be individual learners and demonstrate their abilities in a way that is more unique to their needs. The difficulty lies within the natural desire for parents and veteran teachers to correlate a 1-4 SBG scale score with a 1-4 grade point average on the traditional grading scale. “These two grading systems are not directly related and cannot be inter-woven as such.” (Marzano, 2010)

Without a correlation between a grade and a specific learning goal, a grade can have little value or meaning. Furthermore, teachers within the same grade-level or content area may have different interpretations for the meaning of each grade. “Two years ago we took a look at the elementary schools in the district and started evaluating (grading) consistency,” stated Annie Parker, curriculum and instructional coach for Kannapolis City Schools. “We were not consistent across the district.” (Howell, 2013). Inconsistencies, like the ones found in the Kannapolis Schools, are common in all school districts that have not made a unified grading system plan. Inconsistent grading between teachers and schools leads to the questioning of the value of grades. It becomes difficult to motivate students to get a “good grade” when the value or meaning of the grade is lost.

Standards-Based Grading with an IEP

The question of appropriate grading systems becomes more complicated when schools incorporate the grading of students in special education programs with Individual Education Plans (IEPs). Unbiased opinions and proper representation of students are especially important when working with the Special Education population. Guskey et al (2009) specifically address the use of SBG in special education classrooms. Stating that, "families of children with disabilities find the detailed information offered through standards-based reporting especially vital as they consider placement in intervention decisions." Considering the different levels of service special education students receive, including many variations of mainstream learning, it makes sense to use the most informative, yet unified, grading system possible.

In SBG, the objective is the same for all students, and it is the way in which the mastery is demonstrated that may vary, though the actual objective is not altered, or the level of achievement is noted on the Learning Progression. This system makes showing mastery more applicable for students who do not learn the same way, or at the same pace. However, for students with physical or cognitive limitations, SBG can be unfair, and at times unlawful if a student's IEP goals are not considered in instruction and assessment (Guskey & Jung, 2009). Schools that choose to use SBG have the task of including ways to modify the report card or grade reports to reflect the standard-mastery level, while still maintaining the integrity of the IEP for each child. "While the requirement that every student receiving special education have an IEP is not new, linking the content of a student's IEP to the state's academic standards for the student's enrolled grade is both

new and challenging," claimed the National Center for Learning Disabilities in a 2008 Advocacy Brief. "This approach seeks to raise the learning expectations for students with disabilities—including those with a specific learning disability (SLD or LD)—providing opportunities for students to make significant achievement gains.

"Moving away from the old approach to IEP development, which lacked a focus on closing the student's achievement gap, to a new process that focuses on alignment with what all students are expected to know and do, holds significant promise for students with LD (Guskey et all 2009)." Students on an IEP will be treated more like their peers than ever before with SBG systems. With the intent to communicate an individual student's abilities and areas of growth, SBG and Learning Progression offer an unofficial IEP for each student. Having the classroom instruction and the assessments standard based, makes the use of standard-based IEPs more natural, while they may be challenging to create initially.

The standards-based IEPs paired with SBG and instruction, allow for a more effective method of teaching - full inclusion of special education students in the mainstream classroom. Special education teachers would need to continue to coordinate with general education teachers to determine how law-binding IEP accommodations could be implemented within the SBG system. Often, SBG systems do not naturally take into account the needs and requirements of students with learning, physical, or cognitive impairments (Guskey et al., 2009). These accommodations are required by law and without consideration and implementation, are putting the students at a greater disadvantage. The importance of collaboration and communication between the IEP case

manager, the special education teacher, and the general classroom teacher is critical for a successful SBG learning environment for the student.

Considering inconsistencies between grading systems, differing interpretations of the systems among teachers and schools, special education students' IEP considerations, and lack of training for many educators, how can it be determined what one grade means in comparison to another? The only way to do so is to have a unified, clear, and concise method of grading.

Those Who Challenge Standards Based Methods

With all of the positive and convincing reasons traditional grading may no longer be the best-practice in grading systems, education experts could agree a change is needed. However, many are not convinced SBG is the direction our schools should go. Marzano et all (2011) states "Most educators recognize the inadequacies of their current grading and reporting methods." Marzano further explains that very few people have found a system that "satisfy the diverse needs of students, parents, teachers, school administrators, and community members (Marzano et al., 2011). Marzano believes in SBG, when implemented according to his published guidelines. His for-argument-sake statement is one many others share due to the "fuzzy nature," as Marzano calls it, of the system.

The concept behind SBG is strong and clear. Teachers should grade students on what they know in relation to the standards set for the grade level. However, the various methods of how to translate what a student knows into a grading system causes misinterpretations and numerous "styles" of SBG. The difference between the system in

theory and practice is too great, especially for some higher education institutions, as well as secondary schools who considered trading in the traditional grading method (Sadler, 2005). In this sense, making the change would result in as much unfair grading as the traditional grading systems.

Understandably, most teachers would be opposed to deviating from their current grading systems to SBG without clear and proven data behind the change. Some teachers who have made the switch argue the SBG system actually involves more work for them (Guskey, 2001). Teachers must go through a process of identifying learning goals connected to standards, create Learning Progressions, and develop assessments based on the standards taught. This process is time consuming, and time is already something teachers lack in their workday. However, once completed, the Learning Goals, Learning Progressions, and assessments can be used again, while the delivery of the content and information is altered by the teacher, based on the students' needs from year to year.

It is critical for teachers who want to implement SBG have the support of their administration. There needs to be time to take each step, and time to work as collaborative departments and teams. Many districts have given extra hours for Professional Learning Communities (PLCs) to create time and consider the reality of standardized assessments being created once and then used for years in the future.

The vagueness of some descriptions, lack of inclusion of all students, and various opinions of education-experts on what SBG truly entails, leads to multiple levels of confusion and negative feedback from educators, community members, students, and parents. A common reaction from parents who are learning about SBG is "if it's not

broke, why fix it?" Kelly Mudge (Ezren, 2013), a parent in the Centennial School district in Des Moines, Iowa is in shock that his child's school would even consider changing the grading system. "I'm dumbfounded by how we got to this point. I see nothing to indicate this makes our students stronger." Numerous parents share Mudge's opinion. Without a clear way in which to describe the SBG system, parents cannot be expected to be on board with "yet another change" (Erzen, 2013). Furthermore, the details and data included in SBG reports can often be too overwhelming for parents. In their efforts to provide educators with data-rich information, educators can go overboard (Guskey, 2001). If parents struggle to understand the meaning the reports in SBG, the extra time from teachers goes to waste.

Much of the confusion for parents and students alike, when reading a SBG report stems from the meaning of each score or proficiency level. Simply reporting a student's level of proficiency with regard to a particular standard communicates nothing about the adequacy of the level of achievement or performance (Guskey, 2001). SBG does not compare students and student achievement to one another when assigning grades. If students' grades do not include a comment or note of where they fall in relation to where a student should be at a particular point in the school year, a parent or student can be confused as to what their proficiency level means. If the meaning is unclear, SBG becomes as unfair and misleading as traditional grading systems. This is where the use of Learning Progressions can be helpful, but only if they are a part of the instructional and grading practices with every teacher.

When making the transition to SBG, parent involvement and consistent communication needs to be included in the planning and development stages. If an entire staff is able to use common language when explaining the how, what, and why of SBG to parents and students, the overall reception will be more positive, even if there are still lingering questions or concerns.

Advocates of Standards Based Methods

Grading students based on what they know rather than what they do is a key concept in the SBG method. Consider Figure 1. The grade given using the SBG system was a more accurate representation of what the student had learned and knew compared to the traditional grading system (Scriffiny, 2008). The teacher would be able to take data from assessments and progressions and use it to determine the next lesson needed for that student or use the same data from each student in one class and determine whether or not the class was ready to move on to the next unit of study, or if they needed to review the content.

Using data from SBG to plan future curriculum, lessons, and assessments is exactly what Adams County Schools teacher, Susan Colby, did in her Westminster, Colorado classroom. “With the district’s new focus on standards…my colleagues and I realized that we needed a new grading system…we worked to develop effective grading for the standard-based system. In the process, we became better teachers, focusing on the student’s progress and needs (1999).” Using student data to drive instruction, teachers like Susan Colby are more informed on the progress and growth of each individual student.

Another Colorado teacher has found SBG to be effective in her classroom and has made drastic changes to how her curriculum is structured in an effort to be more fair and constructive in her teaching and assessment. Patricia Scriffiny has adopted SBG in her classroom and does not grade homework as part of the student's final grade. "Of course, it is essential for students to do homework that is tied closely to learning objectives and for students to see those connections (2008)." Scriffiny gives "extensive feedback" on homework and is constantly encouraging her students to make the connection between the practice they are doing on their homework and the assessments given in class. "My goal is to get students to constantly ask themselves, 'Do I know this? Can I do this?'…my homework completions rates have remained steady over the past three years," the Montreal High School teacher states (2008). Assigning homework, but not giving it any value towards a proficiency grade is typical practice in a SBG system, the idea being of homework being practice of a skill, and the assessment is the learned or mastered application of the skill.

In addition to including the assessment of the skill and not the performance when practicing the skill, SBG also allows for the complexity of a topic to be considered. If two tests are given on the same topic, and the first test has basic knowledge recall questions, and the second test contains more analysis or application questions, the two scores cannot be compared using the traditional 100-point test system. Using a 4-point scale - based on a Learning Progression, for example, allows for one test to include multiple levels of knowledge to be assessed at once (Marzano et al., 2011). This scale creates a more fairly

graded assessment and gives the teacher more insight as to what level the student is understanding a specific concept.

Being fair in the grading system is a key principle of SBG. In some schools, students will have the same teacher more than once in a year or in his or her school-career. The use of SBG eliminates the biases or previous negative performance in a teacher's class and strictly considers the growth and proficiency in that grade-level's standards (Erzen, 2013). A student who performed poorly in class one year would have a fresh start the following year, even with the same teacher. In the same respect, a student who struggles with the teaching style of a teacher has the same ability to do well in a SBG system as a student who thrives in the learning environment. Since homework and classwork, as well as behavior and social skills, are not part of the SBG system, all students would be graded using the same criteria, regardless of a teacher's personal opinion of the student (Erzen, 2013).

Positive feedback from implementation of SBG systems has been on the rise with schools in Colorado, as they have reported positive feedback from parents and community members as well, "…because they say they get specific info about their student's progress (Howell 2013)." The schools from Kentucky show data agreeing with the positive response from the community, as well as students and staff members. Teachers are reportedly better able to monitor a student's progress and communicate with both the student and the parents on what areas or concepts are in need of more attention and practice (Guskey et al., 2011). Additionally, the teachers are not feeling the pressure of "extra work." Kentucky schools are hoping to be a leader in the SBG movement.

Whether implemented in a second-grade classroom or a renowned-university, SBG is only fair if it is done correctly, according to educational author, Guskey (2001). “If sufficiently detailed, the information is useful for both diagnostic and prescriptive purposes. For these reasons, SBG facilitates teaching and learning better than almost any other grading method, Guskey (2001).” The difficulty lies within the task of implementing SBG correctly.

Summary

Many great educational researchers have studied whether or not SBG is the fairest method of grading and communicating student mastery of content in relation to the final grade given in a particular course. In this chapter, the previously recorded and data driven research of educational experts and practitioners was be synthesized and analyzed. The connections between the research question and the literature review were explained, as well as an explanation of the history of SBG. Major factors of SBG, including training philosophies and opportunities, as well as evidence to support the impact of SBG implementation were reviewed and discussed. The positive and negative outcomes that results from using SBG with students who are on individualized educational plans (IEP) were evaluated and considered. Both those who oppose SBG and those who are in favor of the grading and assessment method were included, while connections between the two viewpoints were cited throughout the chapter.

Preview

The third chapter will include an overview of the environment that will be used in this research. While assessments and grading take place throughout all grade-levels, this

research will be focusing on the middle or intermediate levels. At this age, their grades are beginning to hold value to the student, they start being more aware of the grades they are seeing on report cards and what effect those marks have on their immediate future. The decision to focus on this age group is out of personal strength and based on the idea that if students begin to understand and articulate their achievement at this age, they may be more likely to understand long term effects of assessments and grades in the future.

CHAPTER THREE

Methods

This research method was reviewed and approved by the IRB of Hamline University.

Introduction

This chapter describes the methods that compared traditional and Standards-based Grading. The questions of: which method of grading is the most effective way to communicate a student's progress and growth through the course of a school year to students, parents, and future teachers were considered and possible solutions were analyzed. The basis for this chapter result from research and literature supporting the mixed methods practice, due to the quantitative and qualitative data being used and collected in this research.

In this chapter, research to support the use of mixed methods will be discussed and presented. The execution of the research including the tools, charts, graphs, and tables to support the data collection and organization, will be explained and provided in this chapter. The subjects being used for this research will be introduced and described. Also in this chapter, the environment in which the subjects of the research live and attend school will be defined and explained, including school demographics and a breakdown of academic success in the school.

Research to Support Mixed Methods

When debating between qualitative and quantitative methods of research and determining which the best fit was for my purposes, it was concluded mixed methods

would be used to properly analyze the data. Mixed methods research, as defined by John W. Creswell in his book *Research Design*, is an approach to inquiry that combines or associates both qualitative and quantitative forms. It involves assumptions and the mixing of both approaches in a study. The combined use of each method provides an expanded understanding of research problems (2009).

The question regarding effectiveness of communicating student achievement and growth with SBG connects to the quantitative design with the use of numerical value from assessments and data that can be described in a factual manner. Students' assessments and scores were compared and contrasted using such numeric values from both traditional and standardized examples. Scores and other numeric values were given using both the traditional percentage scale, and the standardized rubric scales. Both grading practices and their respective scores were documented for each student involved.

Grades and scores themselves have several variables. For example, without a scale or rubric, both grading methods can be subjective or vary from teacher to teacher. For this reason, quantitative research methods were also used in this research. The assessment style and the manner in which it is written can play a role in the type of score given or assigned. The rigor of questions with in an assignment or assessment will play a significant role in the students' ability to complete the task or answer the question correctly. If the rigor of the task does not match the rigor of the expected standard, there will be a discrepancy in the grading, regardless of the system used. This research used assessments that were given at the end of a unit, when students were familiar with content, but were still practicing and using information and content in daily tasks.

How the Research Will be Executed

During several units of study in 5th grade math, formative and summative assessments were given to the students in the classroom, however the data collected was based on the summative end of unit assessments. See Appendix L. Half of the assessments administered were directly from the curriculum. See Appendix M. These assessments are pre-written, based on the content covered within the textbook chapters pertaining to that unit. The assessments are historically graded using a traditional percentage scale, 0-100%, using a direct correlation to correct answers to total number of questions asked.

The second half of the assessments used were created directly from the state test specifications for fifth grade, as well as teacher-written learning progressions related to the content taught during fifth grade math. See Appendix A. These assessments were divided into levels, or rigor, based on the verbiage and intent of the benchmark, and differentiated using Dr. Robert Marzano's Taxonomy of Educational Objectives. See Appendix B. These assessments are designed to be graded using a standards-based scale of 1, 2, 3 or 4, depending on level of mastery in relation to the rigor of each question, based on the benchmark that was being assessed. A score of 4 means the student demonstrates skills above the expectations of the grade-level content, a score of 3 means the student demonstrates skills at the expectations of the grade-level content, a score of 2 means the student demonstrates skills bolow the expectations of the grade-level content, and a score of 1 means the student does not demonstrate skills within the expectations of the grade-level content.

Both types of assessments were scored twice. The first format of scoring used the traditional percentage scale, 0-100%, using a direct correlation to correct answers to total number of questions asked. Assessments were given a percentage score, and then a traditionally corresponding letter grade. The second scoring format used the standards-based scale and assign a score of 1, 2, 3 or 4, based on the mastery level demonstrated on the assessments, in connection to the rigor of the question. See Appendix D.

Next, the students and their parents, as well as a group of teachers, were asked to complete individual surveys, regarding the various scores and assessments. The surveys included questions that helped understand the meaning and message the grades represented to the students and the parents, as well as teachers. Questions in the surveys included open-ended and multiple-choice statements involving their level of understanding of the grades, their concerns regarding the different methods, and their expectations for grades. See Appendices G, H, I.

The assessments and grading methods were used within a fifth-grade classroom, where students have experienced several different teachers, grading practices, and assessment styles. Students all received their assessment scores, but not all students in the class were included in the research analysis.

Who Are the Subjects and Where Are They From?

The participants in this research were from an exurban community outside of suburban towns. The school district was qualified for the state's "Free and Reduced Lunch" program, with 43% of the enrolled students qualifying for the support. The school also had special supports in the form of Title I funding, for students who need

more time and skills practice with math and reading. Furthermore, many of the students in the classroom being used for research came from two-family homes/children of divorce, or single parent homes. The desired outcome was based on the hope that the group of parents who read their student's results and completed the survey were from a mixture of backgrounds, as it is important for educators to communicate effectively to all families, regardless of their background or socioeconomic situations. This school district had 10% of the student body being from a minority race.

The students used in this research were in one of eight fifth grade classrooms and had a 6:1 student to teacher in the classroom for math instruction. There were 25 students in the classroom used for this study, including 12% being of minority race, and 44% qualifying for the free or reduced lunch program. Of the 25 students, 17 came from families of divorce or single-parent homes. The abilities of the students in this class varied, with students from both extreme ends of the academic spectrum. There were four students who were in the math-elite group, and were being challenged on a weekly basis in a math club designed for the mathematically gifted. Three students in this class qualified for the Title I support in math, and two more received special education service for their math curriculum. The 25 students entered fifth grade with 62% of them meeting the fourth-grade state requirements.

The students used in this research were randomly selected from the class. The students did not know that their specific data is being used, as the entire class was assessed and approved for research. If students were to be handpicked, it is possible personal own biases and prior knowledge of their involvement of their parents, or the

individual student's effort may hinder the accuracy of the research. The instructional methods were the same for all students involved in the research.

SBG scales were not used with this group of students prior to this current school year, although the school district involved was considering making a transition to the SBG format in the near future. The teachers being surveyed were not current teachers of the students being assessed and scored. The intent was to determine the level of understanding and summarize the teacher's interpretation of the students' mastery and ability in math. The teachers were selected randomly, as some were using either of the assessment methods also being used in this research study.

Summary

Using mixed methods, this research helped determine the SBG method of grading is the most effective way to communicate a student's progress and growth through the course of a school year to students, parents, and future teachers. This finding will be further evaluated and elaborated in the Conclusion chapter.

This chapter included research to support the use of mixed methods. The execution of the research including the tools, charts, graphs, and tables to support the data collection and organization were explained and provided in this chapter and will continue to be referenced in the following chapter. The subjects used for this research were introduced and described, as was the environment in which the subjects of the research live and attend school. The school demographics and a breakdown of academic success in the school was reviewed and described.

Preview

In the next chapter, the data collected from the assessments and the different methods of grading will be analyzed, compared and contrasted to the literature review and profession opinions and research. The surveys will be read and compiled into three summaries: student, parent, and teacher. The data will be reviewed using charts and data tables, provided. By analyzing the quantitative and qualitative data from the assessments and scores, as well as the student, parent and teacher surveys, a conclusion could be made to help inform teaching and learning theories in the future, pertaining to effective communication between and within schools and families.

CHAPTER 4

Results

Introduction

The results from the mixed method research of traditional and standards-based grading systems were used in order to answer the question of: which method of grading is the most effective way to communicate a student's progress and growth through the course of a school year to students, parents, and future teachers? Based on the summative assessment data collected from the fifth-grade sample students and survey results from the students, their parents, and teachers within the sample school district, it can be stated that SBG is the more effective method of communicating student success.

This chapter will document how the results of the research method correspond to the research question. The information collected in this study will be described systematically, identifying specific themes or patterns that emerged. The interrelationships of the results will be explained and discussed. The results described in this chapter will be consistent with the methods and procedures stated in the methods chapter.

Themes and Patterns that Emerged in the Research Results

When being assessed or critiqued in any fashion, it is always appreciated to understand why a certain score or mark was given. Not unlike the students, parents, and teachers surveyed during this research, people want to understand the rationale behind the assessment of their work. The results of this mix method research show students, parents,

and teachers having a mutual admiration for the SBG system, over the traditional percentage-based method, when it comes to understanding what a particular score represents, as well as, what the expectations are for a given assessed standard or benchmark.

Similarly, the surveyed students, parents, and teachers also have common concerns regarding the SBG system. The main concern voiced by all three groups is in regards to how the SBG system corresponds to high school or college grade-point averages (GPAs). The greatest concern from all parties is whether or not a SBG system will be able to compete with a traditional-grading system report card. Though all groups acknowledged the SBG method is more accurate to the student's ability within a standard or benchmark, it also is more difficult to demonstrate complete mastery of grade-level skills. Students whose grades are percentage-based, are able to have weaknesses in areas without their overall grades being dramatically impacted. The result may cause GPAs of a SBG system student to be lower than a student who has a GPA calculated from percentage-based grades, even though the SBG system student would possibly have a stronger and more complete skill base.

Summative Assessments Results

Instruction given to students used in this research was based on state standards, and the flow of the lessons taught followed a Learning Progression. The curriculum assessments given were based on the Common-Core, however, the students attended school in a state that does not use Common-Core curriculum for math, meaning the curriculum used for instruction did not mirror all standards and benchmarks taught

according to state expectations. The curriculum components were not always used from one page, or even unit, to the next, resulting in the assessment occasionally covering skills that were not taught or discussed during the unit of study.

Traditional grading fit the curriculum assessments in terms of compatibility and ease for the teacher, however, the results did not accurately reflect the student's comprehension of the skills or content. It was unclear when using traditional grading with curriculum assessments what type of questions were difficult for a student or what areas the student would need to improve upon. Using SBG on curriculum assessments was difficult due to the lack of various standard levels within the assessment given. The SBG was skewed due to the need for various levels of rigor within the questions. If the curriculum assessment did not include questions or tasks at the level of expectation the specific standard or benchmark implied, the SBG score would be jeopardized. For example, if the curriculum assessment only assessed foundational level skills, the student would not earn above a 2 using SBG. However, the score of a 2 should not be interpreted to mean the student only has foundational skill comprehension, rather, the student was not accurately assessed.

Looking at Student C in Appendix E, he or she scored a perfect score of 100% on the curriculum assessment #1, earning an A for the Place-value Unit assessment. This means the student answered all questions correctly, however it does not show or prove comprehension in relation to his or her skills within the Place-value benchmarks. When SBG was applied to the same curriculum assessment, Student C scored a 2, which means he or she demonstrated only foundational knowledge of the Place-value benchmarks.

Since the student did not make any errors, it can be assumed the curriculum assessment did not include any more rigorous questions beyond foundational skills needed to comprehend the benchmarks being taught and assessed in the Place-value unit. Using SBG with the curriculum test #1 shows Student C did not comprehend the skills he or she needs to be at grade-level (level 3) in his or her understanding of the Place-value skills.

The standards-based assessments used in this research were aligned with the corresponding Learning Progression, as they were both written directly based on the state standards and expectations of learning for students. When scored with the traditional percentage-based grading, students were unable to determine what their score reflected in terms of their level of comprehension. If a student had only a few errors, it was scored out of the total possible questions.

In contrast, the same standards-based assessment scored using SBG was scored based on the total comprehension within each level of skill. Using over-all grading data from Student P in Appendix E, the SBG score on the standards-based assessment shows the student has basic foundational skills mastered, but he or she was not able to demonstrate comprehension and understanding at grade-level. If that student were to be given a traditional grade with a standards-based assessment, he or she would have received a B-, which would inaccurately depict his or her knowledge of the skills needed in that grade-level content. Comparing Student P's data to the curriculum assessments he or she completed, it is very evident this particular student had a strong understanding of basic knowledge from the units taught. However, he or she was not able to meet grade-level criteria when assessed on specific standard or benchmark related skills.

Student Communication Results

Students completed an anonymous survey in which they were asked several questions regarding grading systems they have been exposed to in school. Students reported a strong understanding of the SBG system with many students describing the method as one where "grades match what we know, if we know the skills for the benchmark then we get a 3." They articulated concern about SBG scores being translated to high school grade-point averages (GPAs), but over-all they described a in favor of the system over the traditional percentage-based method.

When students received standards-based grades, they had been taught what their score meant in terms of comprehension related to the standard or benchmark being assessed. Students recalled feeling confident when getting a SBG score. "I like that when I get a 3 on a test, that means I know what I'm talking about and I'm not missing any information that I will need later." On the contrary, students reflected on the traditional grading system with frustration. "I used to think getting a B was good. But then I realized that it was just a B. I don't really know what that means. What if I don't understand something really important, but I knew enough of the other questions to get a B?" With the SBG scores, the students also understood what areas they needed to improve upon in relation to the learning goals and scales, which are directly correlated to the state standards.

Parent Communication Results

Parents also completed an anonymous survey in which they were asked several questions regarding grading systems their children have experienced in school. The

majority of parents who returned the survey discussed the value in "understanding the expectations for (their) child." With the SBG system, parents also reported "it makes the most sense to know where (their) child is academically." Parents knew which areas in math to focus on when they were helping their child, and which areas their child demonstrated strengths in math.

Like several students, the use of SBG when it comes to high school grades was concerning. Parents wanted to be sure their child was not going to be at a disadvantage when applying for colleges if SBG was used for their child and not all students applying. Another concern some parents shared was the fact that SBG is not what they grew up with, and therefore appreciated the explanation of the system from the teachers who were implementing the method. At the beginning of this research parents of students, whose data would potentially be collected, parents received a letter with a full explanation of the SBG method, and examples of grades and their meaning. Several positive notes and emails were received in response to the letter.

Teacher Communication Results

Teachers (not current teachers of the students were used in the data collected) completed an anonymous survey in which they were asked several questions regarding the two different grading systems. A highlight of SBG for many teachers was that they were able to look at the standard based grades and identify a particular student and the specific skills and benchmarks that needed additional supports and where they needed to be challenged. "Personally, I would feel more confident in my assessments because I would understand exactly what I was assessing and what the results of the assessments

meant," noted one survey from a teacher in the district. "I would feel more capable of communicating what each child was learning, how they were learning it, and how the scores they earned directly correlated to the content and state standards," another teacher commented on their survey. Feelings of confidence in their grading practice were common among teachers, though some were leery to deviate from what they have used their entire career, and likely in their own schooling.

Possibly more so than the students and parents, teachers were concerned with the validity of GPAs for students as they move forward in their education. They were wary to commit to an answer when asked on the survey "If your school district were to unify their grading practices and choose one system for all teachers to use when grading, which system should you choose?" The main, and one of the few, arguments against the SBG method involved the transferring of grades to a GPA in order to meet the criteria for college applications.

Summary: Study Conclusion

The results of the mixed method research have shown SBG is the most effective way to communicate a student's progress and growth through the course of a school year to students, parents, and future teachers. This research has also shown the relevance of SBG to determine what skills the student demonstrates strength and which areas were in need of more practice and reteaching opportunities. However, SBG is only accurate and informative when used with an assessment that is written with the levels of rigor and the specific standard or benchmark skills in mind. Using a curriculum assessment with SBG,

or vice versa, will not result in effective communication between the student's abilities and the score the student earns.

This chapter documented how the results of the research method corresponded to the research question. The information collected in this study was described systematically and identified critical and specific themes and patterns that emerged. The interrelationships of the results was explained and discussed in depth. The results described in this chapter were consistent with the methods and procedures stated in the methods chapter.

Preview

In the next chapter I will reflect on the major learnings that emerged throughout the research process. I will revisit the literature review chapter and make connections between my findings and other research documentation. Possible implications will be discussed and considered. I will acknowledge and describe any limitations of this research study. In the next chapter I will also make recommendations for future research pertaining to the implementation or improvement of SBG. I will also share my plan for professional growth as a result of the findings in this study, as well as how I will communicate my results and evidence to other educators.

CHAPTER 5

Conclusion

Introduction

When I first asked: which method of grading is the most effective to communicate a student's progress and growth through the course of a school year to students, parents, and future teachers, I hoped to academically and professionally prove what I personally have believed since I began teaching. I witnessed my students being misinformed and misguided by scores and grades that held no meaning. I watched my brother be derailed from what could have been because his grades did not accurately reflect his learning and academic potential. I wanted to be using a research-based grading practice that allowed my students the greatest opportunity to grow and learn from their mistakes.

Throughout this research, I have confirmed that standards-based grading is the most effective method of grading is the most effective way to communicate a student's progress and growth through the course of a school year to students, parents, and future teachers. However, I have learned that SBG is only the most effective method of grading when paired with a standards-based assessment.

When students received standards-based grades, they had been taught what their score meant and what they needed to improve upon in relation to the learning goals and scales, which are directly correlated to the state standards. Families knew which areas in math to focus on when they were helping their child, and which areas their child demonstrated strengths in math. Teachers were able to look at the standard based grades

and identify a particular student and the specific skills and benchmarks that needed additional supports and where they needed to be challenged. Personally, I felt more confident in my assessments because I understood exactly what I was assessing and what the results of the assessments meant. I also felt more capable of communicating what each child was learning, how they were learning it, and how the scores they earned directly correlated to the content and state standards.

In this chapter I will reflect on the major learnings that emerged throughout the research process. I will revisit the literature review chapter and make connections between my findings and other research documentation. Possible implications will be discussed and considered. I will acknowledge and describe any limitations of this research study. In the next chapter I will also make recommendations for future research pertaining to the implementation or improvement of SBG. I will also share my plan for professional growth as a result of the findings in this study, as well as how I will communicate my results and evidence to other educators.

Summary of Literature Review

In my review if literature surrounding the topic of SBG, I took comfort knowing I was not the only educator feeling that my grading practices were flawed. Marzano et all (2011) states “Most educators recognize the inadequacies of their current grading and reporting methods.” While knowing I was one of many who felt I was doing a disservice or injustice within my grading system, I found it interesting that so many educators or school districts feel they need to make a change in their grading philosophies, yet they are not immediately gravitating toward SBG. I feel empowered by

the research I read, for and against SBG, and I refuse to continue to be content with inadequacies I have found.

While reading completed research, I discovered several professionals who believed in SBG, as well as several who made points against the system. This discovery was no surprise, as any controversial discussion will have two view points, but I found it interesting to read the professionals and educators who were concerned about SBG, seemed to be more concerned with the change as a whole, or the amount of work it would take the change. "Some teachers who have made the switch argue the SBG system actually involves more work for them (Guskey, 2001)." The concern is legitimate as teachers rarely have spare time and are already juggling so many parts in their day. However, also mentioned by Guskey (2001), "Whether implemented in a second-grade classroom or a renowned-university, SBG is only fair if it is done correctly." To be implanted correctly, a district will have to commit to the time and the funding it would take to support their entire staff, their students, and the families within their school.

Possible Implications of Implementing Standards Based Methods

Making the switch from traditional percentage-based grading to SBG is not as easy as using a rubric and Learning Progression. First, training in SBG must occur, so staff can then move forward with creation of critical documents. Learning Goals, Learning Progressions, standards-based assessments and curriculum alignment all need to be written and reviewed. It takes a great deal of time to develop those pieces, and training to implement them effectively. Besides finding the time with contract days to allow for

such work, many school districts many have a difficult time funding training and work time for staff members.

For high school teachers, it would take extra time and research to adapt a SBG model due to the nature of transcript reporting. Students grades need to reflect their learning, but they also need to be compatible with colleges around the world. School districts will need to research and communicate with higher-education staff to ensure the validity of the SBG from both parties.

Additionally, parents will need to be educated on what SBG is, how it works, the value, and possible misconceptions. Commonly, parents will see a 4-point scale and assume a 4 is the highest and therefore the expectation. It could also be confused that a 4 is equivalent to an A or a 4.0 in terms of grade point average. Training, which will also take time and funding, for parents would be critical for SBG to have the fullest effect in communicating student success.

Limitations of the Research

This research was meant with some limitations that should be considered when challenging a grading system. The sample size I used in this project was within one classroom, at one school, in one district. Though the sample was blind and unbiased, the students providing the scores came from the same physical region. They have all been filtered through the same institution, and by fifth grade they have developed academic patterns and habits that students in other school systems may have not.

I used random selection from a pool of students to collect my data, however, only students who had parent and guardian permission to participate were included in the

selection pool. Needing parental consent to use student data is a legal matter, though it limits the data collected from being completely inclusive of all students. There were several students who did not obtain permission to share data who would have been interesting outliers due to their extreme strengths or deficiencies in math.

Math assessments were the focus of my research in order to collect and interrupt data in a timelier fashion. Standards based grading is something my school is using in math, but other content area teams are having a more difficult time adapting with the patterns of their curriculum. To say SBG is the more effective way to communicate student success may be true from this research in math, however, there is no evidence to make that statement true when it is reading or writing in question.

Future Projects for the Researcher

As an educator who would like to continue to grow and improve her practices, I would like to investigate the ideas of future projects related to effective grading systems. The next step for me would be to look beyond math and research how to implement SBG into my science assessments. Though I do not currently teach English-language Arts, I believe SBG can provide a platform for teachers in this content area, with some research, guidance, and time. I would like to facilitate some discussion on the concerns teachers are having with making SBG work for their classroom.

Summary

Moving forward, I plan to use this research to support my grading practices in my own math classroom. My considerations will include not only solidifying my grading practices with SBG methods, but also the effectiveness of my feedback and use of

rubrics. I will spend time reflecting on the type of feedback I am giving, being mindful of the words I'm using to describe the students' work in relation to the benchmark being assessed. I am going to work on making my rubrics student-friendly while still staying true to the standard being assessed. The work with rubrics will include continuing to work with my grade-level math team to improve our standards-based assessments, to ensure the rigor and therefore the validity of the rubric for grading on the SBG scale.

My current principal is excited about this research and is looking forward to a discussion regarding using SBG across the intermediate grade levels. I have already begun preparing a professional development in-service for my colleagues to share my findings and help begin the transition to SBG across grades three, four, and five in our building. I am pleased with the findings, but I will continue to reflect and challenge to ensure I am the most effective educator possible.

APPENDICES

APPENDIX A

Learning Progression for 5th Math Benchmarks

Geometry: Volume/Surface Area

5.3.2.2: Use various tools and strategies to measure the volume and surface area of objects that are shaped like rectangular prisms.

5.3.2.3: Understand that the volume of a 3D figure can be found by counting the total number of same-sized cubic units that fill a shape without gaps or overlaps. Use cubic units to label volume measurements.

5.3.2.4: Develop and use the formulas V=lwh and V=Bh to determine the volume of rectangular prisms. Justify why base area B and height h are multiplied to find the volume of a rectangular prism by breaking the prism into layers of unit cubes.

I am a 4 **if I can…**	____ Solve a real world problem by determining surface area and or volume.
I am a 3 **if I can…**	____ Use various strategies to measure the volume of objects shaped like a rectangular prism. a) Count the cubic units to determine the volume of a shape. b) V=lwh and V=Bh are equal c) Break a rectangular prism into layers to show why B (area of the base) times height is equal to the volume ____ Use various strategies to measure the surface area of objects shaped like a rectangular prism.
I am a 2 **if I can…**	____ Define: surface area, volume ____ Know the formulas for volume ____ Find the area of a rectangle
I am a 1 **if I can…**	____ With help, have some understanding of surface area and volume

APPENDIX B

Marzano's Taxonomy used to create Learning Progression

Marzano's Taxonomy – Useful Verbs	
Recognize • recognize (from a list) • select (from a list) • identify (from a list) • determine (true / false)	Retrieval
Recall • name • list • describe • state • identify who, where, or when • describe what	
Executing • use • demonstrate • show • make • draft • complete	
Integrating • summarize • paraphrase •describe the key parts of • describe the relationship between • Explain the ways in which • describe how or why • describe the effects	Comprehension
Symbolizing • use models • symbolize • depict • represent • draw • illustrate • show • diagram • chart	
Matching • compare and contrast • categorize • sort • differentiate • discriminate • distinguish • create an analogy or metaphor	Analysis
Classifying • classify • organize • sort • identify different types or categories • Identify a broader category	
Analyzing Errors • edit • revise • identify errors or problems • evaluate • identify issues or misunderstandings • assess • critique • diagnose	
Generalizing • form conclusions • Create a principle, generalization, or rule • trace the development of • generalize • what conclusions can drawn • what inferences can be made	
Specifying • make & defend • predict • what would have to happen • develop an argument for • judge • under what conditions • deduce	
Decision-Making • select the best among the following alternatives • which of the following would best • what is the best way • decide • which of these is most suitable	Knowledge Utilization
Problem-Solving • solve • adapt • develop a strategy • figure out a way • how would you overcome • how will you reach your goal under these conditions	
Experimenting • experiment • generate & test • test the idea that • what would happen if • how would you test that • how can this be explained • how would you determine if • based on the experiment, what can be predicted	
Investigating •investigate • research • find out about • take a position on • how & why did this happen • what would happen if • what are differing features of	

APPENDIX C

Traditional Percentage-Based Grading Scale

93% - 100%	A	4.0
90% - 92%	A-	3.7
87% - 89%	B+	3.3
83% - 86%	B	3.0
80% - 82%	B-	2.7
77% - 79%	C+	2.3
73% - 76%	C	2.0
70% - 72%	C-	1.7
67% - 69%	D+	1.3
63% - 66%	D	1.0
60% - 62%	D-	0.7
0% - 59%	F	0.0

APPENDIX D

Standards-Based Grading Scale

Score 4.0	More complex content
Score 3.0	Target learning goal
Score 2.0	Simpler content
Score 1.0	With help, partial success at a score of 2.0 content or higher
Score 0.0	Even with help, no success

APPENDIX E

Results of Standards-based and Traditional Assessments

Results

T - Traditional Grade S – Standards-Based Grade

	Test 1: Placevalue		Test 2: Area of 2D Figures		Test 3: Landmarks		Test 4: Division		Test 5: Equivalent Fractions			
	Curriculum Assessments											
	Test 1		Test 2		Test 3		Test 4		Test 5		Overall Grade	
Student ID	S	T	S	T	S	T	S	T	S	T	S	T
Student A	**1**	**95**	**1**	**80**	**2**	**85**	**1**	**75**	**1**	**60**	**1**	**79/C+**
Student B	1	95	1	80	2	95	1	65	2	75	1	82/B-
Student C	**2**	**100**	**3**	**100**	**2**	**100**	**3**	**100**	**3**	**100**	**3**	**100/A**
Student D	1	95	2	60	2	95	2	75	3	85	2	82/B-
Student E	**1**	**95**	**1**	**70**	**1**	**80**	**2**	**75**	**3**	**80**	**1**	**80/B-**
Student F	1	75	1	70	2	100	1	55	2	75	1	75/C
Student G	1	95	1	60	1	75	2	75	3	80	1	77/C+
Student H	1	95	2	80	2	100	2	80	3	85	2	88/C+
Student J	1	75	1	80	1	80	1	65	2	65	1	73/C
Student K	1	80	1	60	1	70	1	75	2	70	1	71/C-
Student L	1	85	1	70	1	70	1	75	3	75	1	75/C
Student M	1	75	1	65	2	95	2	75	3	75	2	77/C+
Student N	1	90	1	75	2	85	1	80	2	60	1	78/C+
Student P	**2**	**100**	**2**	**100**	**2**	**100**	**2**	**75**	**2**	**75**	**2**	**90/A-**
Student Q	1	95	1	80	1	85	1	60	2	60	1	76/C
Student R	2	100	1	95	2	100	1	100	3	100	2	99/A
TOTAL	Percent of Students Passing/At Grade-level Expectations										6%	100%

	Standard Based Assessments											
	Test 1		Test 2		Test 3		Test 4		Test 5		Overall Grade	
Student ID	S	T	S	T	S	T	S	T	S	T	S	T
Student A	**2**	**91**	**2**	**69**	**3**	**64**	**3**	**85**	**2**	**91**	**2**	**80/B**
Student B	3	95	**2**	**88**	3	71	**2**	**92**	4	100	3	89/B+
Student C	**4**	**100**	**4**	**100**	**4**	**100**	**4**	**100**	**4**	**100**	**4**	**100/A**
Student D	3	95	3	81	3	79	4	100	4	100	3	91/A-
Student E	**2**	**91**	**3**	**94**	**3**	**79**	**2**	**77**	**4**	**100**	**3**	**88/B+**
Student F	2	77	2	63	3	79	1	15	3	97	2	66/D
Student G	3	95	2	63	3	87	3	92	**2**	**91**	**3**	**86/B**
Student H	4	100	4	100	3	86	4	100	4	100	4	97/A
Student J	**2**	**86**	2	75	3	71	2	77	**2**	**86**	**2**	**79/C+**
Student K	3	95	1	56	3	71	1	38	**1**	**66**	**2**	**65/D**
Student L	3	95	2	69	3	71	3	92	3	97	3	85/B
Student M	3	95	2	56	3	79	**2**	**85**	**2**	**91**	**2**	**81/B-**
Student N	**2**	**86**	2	44	3	79	2	69	**1**	**82**	**2**	**72/C-**
Student P	**2**	**85**	**2**	**75**	**1**	**65**	**3**	**92**	**2**	**70**	**2**	**81/B-**
Student Q	3	95	2	56	3	79	3	92	**2**	**89**	**3**	**82/B-**
Student R	3	95	3	88	4	100	3	92	4	100	3	95/A
TOTAL	Percent of Students Passing/At Grade-level Expectations										56%	100%

- Curriculum Test 1 – 20 questions, all level 2 questions, fairly fundamental, all but one question asked the same type of question with different numbers assessing the same skills repeatedly
- Curriculum Test 2 – 20 questions, approximately half level 2 questions, several beyond a 3 or unrelated to benchmark
- Curriculum Test 3 – 20 questions, all level 2 or unrelated to benchmark
- Curriculum Test 4 – 20 questions, challenging rigor, all at or above benchmark level 3
- Curriculum Test 5 – 20 questions, mix of level 2 and 3, closest of the 5 assessments to the standards-based assessment type of questions

APPENDIX F

Survey Given to Students

<table>
<tr><td colspan="2">Survey for STUDENTS:
"Communicating Your Progress and Growth Through the Course of a School Year"</td></tr>
<tr><td>1. Do you know what the traditional percentage-based grading system is? If you do, describe it in your own words.</td><td></td></tr>
<tr><td>2. Do you know what the standards-based grading system is? If you do, describe it in your own words.</td><td></td></tr>
<tr><td colspan="2">3. Describe what the two different grades below say about your progress on the skills assessed:</td></tr>
<tr><td>Traditional Percentage-Based Grading Scale:
A =
B =
C =
D =
F =</td><td>Standards-Based Grading Scale:
4 =
3 =
2 =
1 =</td></tr>
<tr><td>4. Which grading system do you like better? Why?</td><td></td></tr>
<tr><td>5. Thinking about the grading system you like best, what are some problems with it?</td><td></td></tr>
<tr><td>6. If teachers could only use one grading method, and they all have to use the same, which one should they choose? Why?</td><td></td></tr>
</table>

APPENDIX G

Survey Given to Parents

<table>
<tr><td colspan="2">Survey for PARENTS:
"Communicating Your Child's Progress and Growth Through the Course of a School Year"</td></tr>
<tr><td>1. Are you familiar with the traditional percentage-based grading system? If so, describe your understanding.</td><td></td></tr>
<tr><td>2. Are you familiar with the standards-based grading system? If so, describe your understanding.</td><td></td></tr>
<tr><td colspan="2">3. Describe what the different grades below reflect regarding your child's progress on the skills assessed:</td></tr>
<tr><td>Traditional Percentage-Based Grading Scale:
A =
B =
C =
D =
F =</td><td>Standards-Based Grading Scale:
4 =
3 =
2 =
1 =</td></tr>
<tr><td>4. Which grading system do you prefer for your child? Why?</td><td></td></tr>
<tr><td>5. Considering your preferred grading system, what may be some flaws anticipated with the method?</td><td></td></tr>
<tr><td>6. If your child's teachers were to unify their grading practices and choose one system for all grading, which system should they choose? Why?</td><td></td></tr>
</table>

APPENDIX H

Survey Given to Teachers

<table>
<tr><td colspan="2">Survey for TEACHERS:
"Communicating Student Progress and Growth Through the Course of a School Year"</td></tr>
<tr><td>1. Are you familiar with the traditional percentage-based grading system? If so, describe your understanding.</td><td></td></tr>
<tr><td>2. Are you familiar with the standards-based grading system? If so, describe your understanding.</td><td></td></tr>
<tr><td colspan="2">3. Describe what the different grades below reflect regarding a student's progress on the skills assessed:</td></tr>
<tr><td>Traditional Percentage-Based Grading Scale:
A =
B =
C =
D =
F =</td><td>Standards-Based Grading Scale:
4 =
3 =
2 =
1 =</td></tr>
<tr><td>4. Which grading system do you prefer for communicating a student's progress? Why?</td><td></td></tr>
<tr><td>5. Considering your preferred grading system, what may be some flaws anticipated with the method?</td><td></td></tr>
<tr><td>6. If your school district were to unify their grading practices and choose one system for all teachers to use when grading, which system should you choose? Why?</td><td></td></tr>
</table>

APPENDIX I

Consent Letter to Parents

October 4, 2017

Dear Parents/Guardians,

Over the past few years I have been working towards my Masters in Education at Hamline University. This fall I will completing my research and graduating in December. My thesis and research is focused on assessments and grading. As a teacher and a parent myself, I am curious about the correlation between my students' grades, what they think the grades mean, whether students are actually retaining information in relation to the grades they earned, the potential bias of grades, and the overall system of testing and assigning grades.

In order to conclude my research, I am asking for your permission to anonymously use your student's data to help determine the effectiveness of my classroom grading system in terms of communicating student achievement through standards-based assessments and grading.

I would like collect data from students' test scores and classroom assessments from Trimester 1, which ends November 30th. Using the test scores, along with anonymous surveys, I will compare grades and scores to student, parent and teacher's understanding and perception of what the grades mean and reflect. Surveys will be completely anonymous and no names or other personal information will be documented or used in the research or published thesis. The surveys will include questions regarding the student or your own understanding of what a particular grade means or represents. Surveys will be digital and shared via email, on a voluntary basis with parents, and with all students who receive permission to participate.

With any research or study, there can be questions of concern for potential participants. Parents/guardians may feel they need to participate to support their child, or that a student needs to participate to be a compliant member of the classroom. However, participation is completely optional, anonymous, and will not reflect or impact my personal opinion or subsequent grades or comments in a students' report cards or otherwise.

By participating in the study, however, you receive a summary of the research-based information and conclusions of the effectiveness of communicating student achievement through standards-based grading. The summary will be provided to all participants and their families.

All surveys will be used for research purposes and will not include any information of the person who completed the survey. The test scores and grades collected and documented will be anonymous by using copies with names removed prior to data collect.
If you have further questions regarding this study or thesis research project, please feel free to contact me or my supervising professor at Hamline University (contact information below).

Again, participation is voluntary and deciding not to participate or to discontinue participation will have no penalties or otherwise negative responses toward the student or family.

Regards,

Elizabeth M. Young
Classroom Teacher and Hamline University Graduate Student eyoung@c-ischools.org
Matthew H. Olson
Institutional Review Board Chair at Hamline University mholson@hamline.edu

(cut bottom portion off if giving permission and have student return it to Mrs. Young by Oct. 13th - - keep the top portion for your records)

****

By signing and returning the form below, you are giving consent for your child's test scores and/or classroom assessment scores to be used for research data collection purposes related to the thesis study conducted by Elizabeth Young during October and November 2017. All data will be and remain anonymous.

Student: _____ Date: _____

Parent/Guardian: _____

APPENDIX J

Permission Letter to and from Principal

RE: Masters work

DELETE REPLY REPLY ALL FORWARD ...

Mark as unread

Scott Peterson
Wed 5/31/2017 1:54 PM

To: Elizabeth Young;

You replied on 5/31/2017 2:04 PM.

Elizabeth,
This is absolutely fine, and like you mentioned, you will keep all student names' off the data. I would like to see what you end up with, as I think it would be very interesting!!
GREAT luck!

Scott Peterson
Principal - Cambridge Intermediate School
763-691-6605

From: Elizabeth Young
Sent: Wednesday, May 31, 2017 10:25 AM
To: Scott Peterson
Subject: Masters work

Scott,

I am finishing the final portion of my Masters thesis and would like your permission to use student data in my research. I would be using test scores and grades, however, they would be name-less/anonymous and completely unattached to a specific student. I am comparing test scores to grades given in a course, as well as anonymous surveys to some teaching staff, parents and students regarding grades and what they mean to them in their respective roles. Would this be ok? I will gladly share any further information you would like to have or hear.

Elizabeth Young

APPENDIX K

IRB Proposal Response

HAMLINE UNIVERSITY

TO: ELIZABETH HENNEN YOUNG

FROM: HAMLINE UNIVERSITY INSTITUTIONAL REVIEW BOARD (IRB)
(10/2/17)

RE: IRB APPROVAL

Your proposal entitled "Communicating Student Achievement Through Standards-Based Assessment and Grading" is exempt from review and therefore approved.

Thank you for registering with the IRB.

Good Luck with your project.

www.hamline.edu 1536 Hewitt Avenue, Saint Paul, MN 55104-1284 p: 651-523-2800

APPENDIX L

Standards-Based Assessment

Name: _____ **Date:** _____ **Class:** _____

Learning Goals:
- Use various tools and strategies to measure the volume and surface area of objects that are shaped like rectangular prisms.
- Understand that the volume of a 3D figure can be found by counting the total number of same-sized cubic units that fill a shape without gaps or overlaps. Use cubic units to label volume measurements.
- Develop and use the formulas V=lwh and V=Bh to determine the volume of rectangular prisms. Justify why base area B and height h are multiplied to find the volume of a rectangular prism by breaking the prism into layers of unit cubes.

Level 2 Questions…

1.) Find the area of the following rectangle.

Area= _____ sq. cm.

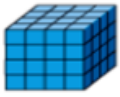
2.) If Terry is using gift wrap to wrap a present in a shoebox, which of the following does he need to know in order to have the right amount of wrapping paper?

Circle your choice…

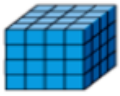
a.) surface area b.) volume

Level 3 Questions…

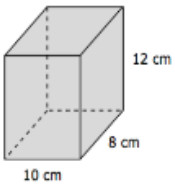
3.) Find the volume of the shape below. _____ cm^3



Find the surface area of the shape below. _____ cm^2



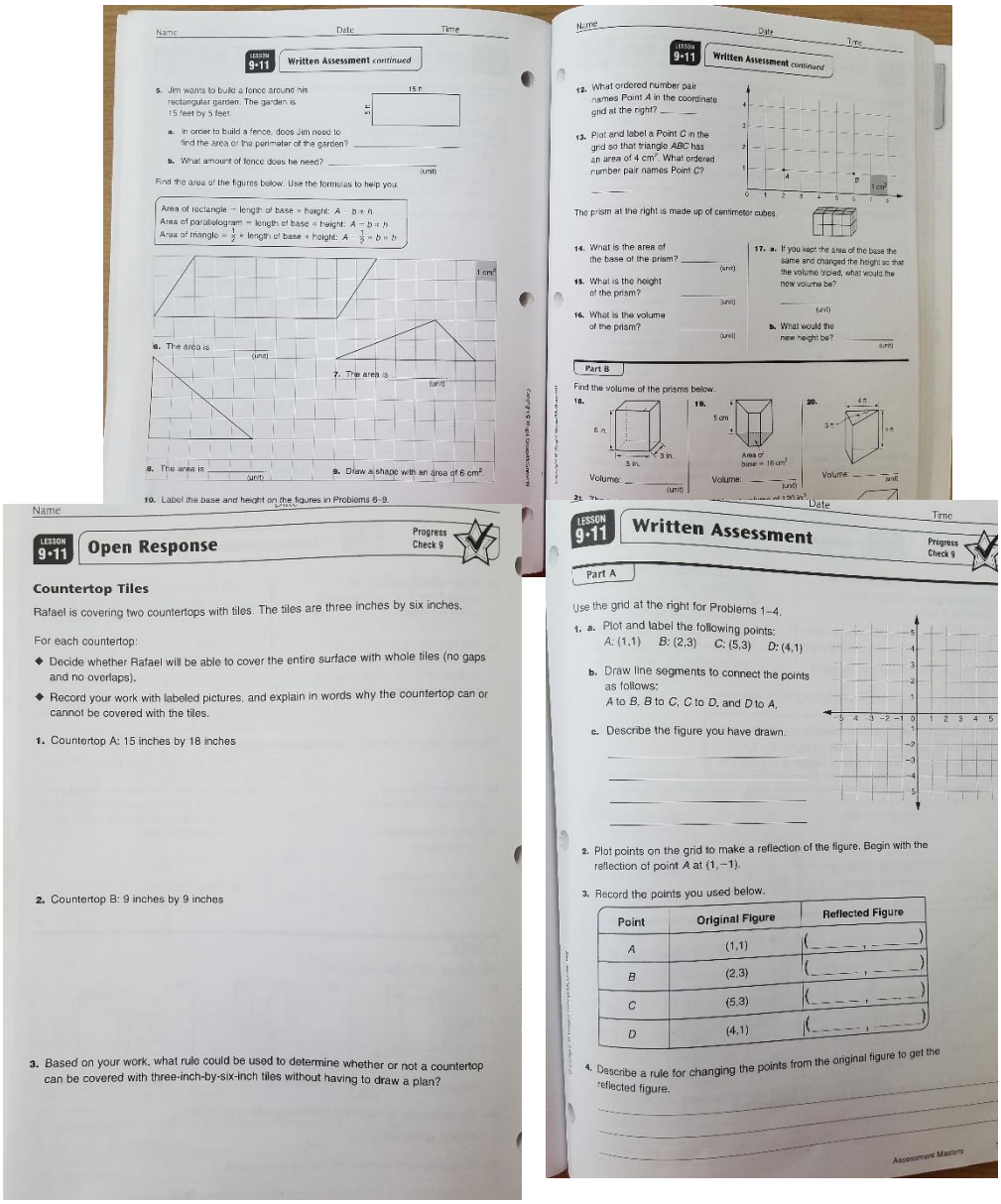
4.) If Mrs. Kelzer wraps the box below in paper, how much paper will she need?



_____ cm^2

APPENDIX M

Traditional Percentage-Based Assessment



Name Date Time

LESSON 9•11 Written Assessment continued

5. Jim wants to build a fence around his rectangular garden. The garden is 15 feet by 5 feet.

a. In order to build a fence, does Jim need to find the area or the perimeter of the garden? _____

b. What amount of fence does he need? _____ (unit)

Find the area of the figures below. Use the formulas to help you.

Area of rectangle = length of base × height: $A = b \times h$
Area of parallelogram = length of base × height: $A = b \times h$
Area of triangle = $\frac{1}{2}$ × length of base × height: $A = \frac{1}{2} \times b \times h$

6. The area is _____ (unit)

7. The area is _____ (unit)

8. The area is _____ (unit)

9. Draw a shape with an area of 6 cm².

10. Label the base and height on the figures in Problems 6–8.

Name Date Time

LESSON 9•11 Written Assessment continued

12. What ordered number pair names Point *A* in the coordinate grid at the right? (,)

13. Plot and label a Point *C* in the grid so that triangle *ABC* has an area of 4 cm². What ordered number pair names Point *C*?

The prism at the right is made up of centimeter cubes.

14. What is the area of the base of the prism? _____ (unit)

15. What is the height of the prism? _____ (unit)

16. What is the volume of the prism? _____ (unit)

17. a. If you kept the area of the base the same and changed the height so that the volume tripled, what would the new volume be? _____ (unit)

b. What would the new height be? _____ (unit)

Part B

Find the volume of the prisms below.

18. 6 in. 5 in. 3 in. Volume: _____ (unit)

19. 5 cm Area of base = 16 cm² Volume: _____ (unit)

20. 4 ft 3 ft 4 ft Volume: _____ (unit)

21.

Name Date Time

LESSON 9•11 Open Response Progress Check 9

Countertop Tiles

Rafael is covering two countertops with tiles. The tiles are three inches by six inches.

For each countertop:

- Decide whether Rafael will be able to cover the entire surface with whole tiles (no gaps and no overlaps).
- Record your work with labeled pictures, and explain in words why the countertop can or cannot be covered with the tiles.

1. Countertop A: 15 inches by 18 inches

2. Countertop B: 9 inches by 9 inches

3. Based on your work, what rule could be used to determine whether or not a countertop can be covered with three-inch-by-six-inch tiles without having to draw a plan?

Name Date Time

LESSON 9•11 Written Assessment Progress Check 9

Part A

Use the grid at the right for Problems 1–4.

1. a. Plot and label the following points:
A: (1,1) *B*: (2,3) *C*: (5,3) *D*: (4,1)

b. Draw line segments to connect the points as follows:
A to *B*, *B* to *C*, *C* to *D*, and *D* to *A*.

c. Describe the figure you have drawn.

2. Plot points on the grid to make a reflection of the figure. Begin with the reflection of point *A* at (1,−1).

3. Record the points you used below.

Point	Original Figure	Reflected Figure
A	(1,1)	(,)
B	(2,3)	(,)
C	(5,3)	(,)
D	(4,1)	(,)

4. Describe a rule for changing the points from the original figure to get the reflected figure.

Assessment Masters

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