HANLONMATH

BAM

Focusing Professional Development on

What Teachers Teach

How Teachers Teach It

Student Performance

Changes In Instructional Strategies Based Upon Student Performance

Backward Assessment Model

PREPARING FOR A UNIT

A. Identify what students should know, recognize, understand, communicate and be able to do on the selected unit (Specification Sheet) based on the common core standards, state standards, district curriculum and mathematical content.
B. Identify how long it should take to teach the selected unit (Benchmarks).
C. Determine how and what to assess on the selected unit to help ensure consistency (portability) and fairness between classes of the same grade level or same subject (Assessment Blueprint).
D. Create a parallel constructed practice test and use the STAR highlighting system.
E. Identify how to introduce concepts and skills to create interest and enthusiasm.
F. Identify linkages to previously learned math and outside experiences to review and reinforce concepts and skills and address student deficiencies.
G. Identify simple-straight forward examples that clarify concepts and skills being introduced without getting bogged down in arithmetic or variations.
H. Using data and experience to identify topics within that selected unit in which students traditionally experience difficulty.
I. Share with other teachers successful teaching strategies to overcome those difficulties and/or deficiencies.
J. Share content knowledge, resources, and expertise to address student success on the identified unit.
K. Using data, discuss way to involve special education or ELL facilitators if specific student populations are not experiencing the same success as the general population.
L. Examine the results of the last unit test or other testing data to further determine strengths and weaknesses of individual student's understanding of subject matter.
M. Identify students not meeting proficiency on standards and develop a plan and timetable to remediate those students.
N. Establish protocols so student learning is monitored continuously, have students read, write, speak, link, explain, and justify what they are learning as well as looking at their guided practice.
O. Be able to visualize how student notes should be set up so they can study more effectively and efficiently.
P. Create algorithms/procedures based on concept development/linkages/patterns. Place example (visual) beside the algorithm.
Q. Use choral recitation to embed algorithms, definitions, and formulas in short-term memory. Remember to connect those to examples. Read, Think & Talk out loud so students see how you are making decisions.
R. Create homework assignments that support instruction. More than just exercises - include vocabulary, formulas, algorithms, and modeling, and explanations
S. Know how to close the unit by ensuring students see the big ideas and can differentiate between problems in the unit.
T. Create a strategy to monitor student learning and prepare students to be successful on unit/chapter tests.
U. Identify instructional practices you will change for next year to correct deficiencies and improve student achievement.

BAM Plan

Table of Contents

BACKWARD ASSESSMENT MODEL

Professional Development Through Sharing

Educational research strongly suggests that professional interaction—at times informal and teacher driven—is often far more influential than formally organized professional development, and is more likely to result in changed behavior.

BAM changes the way professional development is delivered. Rather than having an outside expert tell teachers what needs to be done, the assessment model uses the expertise of the school's staff. Educational research strongly suggests professional development should primarily be on-site, ongoing, and regularly scheduled. Professional development should focus on the discipline teachers' teach, in content and pedagogy with classroom teachers as active participants. The *BAM* places the professional development emphasis on *academic standards* and *best practices*.

The *BAM* is a communication model. Its strongest attribute is that it provides teachers an opportunity to share their **knowledge, understanding, strategies, skills, experiences,** and **resources** with each other**.** Experienced teachers generally know where students traditionally experience difficulty and can communicate this to less experienced teachers. Likewise, all teachers can communicate knowledge, model successful strategies, and share accommodations that help students succeed. *BAM* also provides all teachers, experienced and new, opportunities to reexamine and reflect upon their own practices.

There are two basic premises of *BAM*. The first is testing drives instruction, and the second is that teachers make a difference, and teachers working together make a greater difference. The testing referred to are teacher made tests – not state or national tests. It is our belief that teachers can gain much more rich and in-depth information from their own unit tests than they could get from a state or national test with a limited number and types of questions. It is also our belief that if teachers' tests are balanced and their test questions are asked with the same formality that are used on high stakes tests, then their students should be successful on any test administered to them. The simple fact of the matter is that many states do not test the process standards, the very standards that increase student understanding, make connections, and enable students to reconstruct those concepts and skills after they have been forgotten over time.

Specification Sheet

Before instruction on a major unit of study, grade level or subject area teachers should develop a **SPECIFICATION SHEET**. That is, before they begin teaching a unit, teachers should meet by grade or subject level (3rd grade teachers, algebra teachers, 6th grade science, etc.) and identify what they expect students to know, recognize, understand, communicate and be able to do in that unit and the timelines to accomplish those goals. The specification sheet requires teachers to teach the new state academic standards, school district curriculum guides, and incorporate any benchmarks already established.

Assessment Blueprint

The second piece is the **ASSESSMENT BLUEPRINT.** To ensure students are receiving balanced instruction, teachers should determine how they are going to assess their students. The assessment should include the *Teacher Expectancies* for *balance* and some type of agreement on questions that promotes *consistency* and *fairness*. Balance has been defined as: Vocabulary & Notation, Conceptual Development & Linkage, Memorization of Important Facts and Procedures, Applications, and the Appropriate Use of Technology. The blueprint does not identify specific questions, but the approximate number and type of questions. In math, for instance, 6th grade math teachers might agree to have approximately 20 questions on a test, then determine how many might be computation, vocabulary/identification, word problems, modeling, etc.

It is important to note that while grade level or same subject teacher agree on the specifications and the assessment blueprint, it is preferable, but not necessary for all teachers to give the same assessment. One teacher might decide to have four computation problems, while another might choose to have six. That is okay. The goal is to assess students in similar ways and at approximately the same level of difficulty. This approach will help ensure that a grade of "B" earned in one class would transfer to a grade of "B" in the same class or subject, but taught by a different teacher. However, it should be noted, the more that tests are identical, the higher the correlation between the students grades.

On the following pages, examples of a Specification Sheet, Assessment Blueprint, and a sample test reflecting the items listed on the specification sheet and the number and types of questions on the assessment blueprint are provided.

TEST SPECIFICATION SHEET
Fractions

Definitions – fractions, proper, improper, mixed, reciprocal

Identification – numerator and denominator

Equivalent Fractions – converting and reducing

$+, -, \times$ and $\div$ fractions

Borrowing, whole and mixed numbers

Algorithms for $+, -, \times$ and $\div$

Rules of Divisibility: 2,3,4,5,6,8,9,10

GCF, LCM

Common denominator – 4 methods

Draw models for =, $+, -, \times$ and $\div$

Ordering / comparing

Applications (word problems)

Open-ended concept or linkage

TEST BLUEPRINT
Fractions

2 Definitions

1 Identification

2 algorithms / information

1 rule of divisibility

2 concept / linkage problems – open ended

1 draw model

1 ordering

1 reduce

4 computation, $+, -, \times$ and $\div$

1 GCF, LCM

3 word problems

Cumulative questions

MODEL TEST

Fractions

On questions 1-3, write the definition for each.

1. ***Fraction

2. *Proper fraction

3. ***Reciprocal

4. *In the numeral $\frac{3}{8}$, the 8 is called the _____.
5. ***List two methods for finding a common denominator.

6. *Write the steps, as discussed in class, for adding fractions.

Items 7-14 are 2 star problems
On question 7-10, evaluate each expression. Simplify your answers.

7. $\frac{5}{7}+\frac{1}{3}$

8. $\begin{array}{r} 12\frac{1}{2} \\ -7\frac{2}{3} \\ \hline \end{array}$

9. $5\frac{1}{2}\times\frac{2}{3}$

10. $\frac{3}{4}\div\frac{1}{8}$

11. Find the LCM and GCF of 108 and 72.

12. Reduce the following fractions to lowest terms (simplest form.)

a. $\frac{8}{12}$ b. $\frac{27}{63}$ c. $\frac{111}{207}$

13. Write a five-digit numeral divisible by 2, 3, 4, 5, 6, 8, and 10, but not 9.

14. Order the following fractions from least to greatest. Show your work or explain the strategies that you used.

$$\frac{3}{4}, \frac{7}{10}, \frac{5}{7}$$

15. If the numerator of a fraction remains constant and the denominator increases, what happens to the value of the fraction? (Assume the numerator and denominator are positive.)

16. A student added $\frac{1}{7}+\frac{4}{7}$ with a result of $\frac{5}{14}$. The answer is incorrect. What is his error and how would you explain to him the reason behind the correct answer?

17. Draw a model to show that $\frac{1}{2} = \frac{4}{8}$.

18. *Bob owns five-ninths of the stock in the family company. His sister Mary owns half as much stock as Bob. Jill owns the rest of the stock. What **part** of the stock does Jill own?

19. *Joel worked $9\frac{1}{2}$ hours one week and 11 hours and 40 minutes the next week. How many more hours did he work the second week than the first?

20. *A person has $29\frac{1}{2}$ yards of material available to make uniforms. Each uniform requires $\frac{3}{4}$ yard of material. How many uniforms can be made? How much material will be left over?

21. ***Write a home phone, cell number, email or home address to contact your parent or guardian. (CHP)

With experienced classroom teachers involved in this process, it might take 15 or 20 minutes to create a specification sheet that is based on the school district's curriculum documents and state standards. Experienced teachers can identify the approximate time need to cover the unit.

It generally takes longer to come to consensus on the assessment blueprint. Teachers need to keep in mind the assessment blueprint is a guide and teachers should work toward building a consensus; **it is not a binding agreement**. Please note the Fraction Test did not follow exactly the Assessment Blueprint. Classroom teachers continue to make up their own tests unless they want to create common tests by grade level or subject.

Creating an assessment blueprint can cause friction between teachers. Traditional teachers might emphasize memorization of rules. Constructivists might emphasize conceptual development. We emphasize balance as we have defined it; it's not an either/or situation. While we expect students to memorize important information, we also expect them to understand where that information (rules and procedures) came from. Because testing does drive instruction, by requiring procedures and concept development be tested, this forces teachers to change their instruction. That change does not come without resistance, it does not come easy in some cases.

One area where teachers should take special precautions is in the writing of test questions. Too often classroom teachers use less formal language on their teacher-made unit tests, sometimes resulting in students not recognizing information that is tested on state or national exams. Care should be taken in writing test items so students are exposed to the way those questions are phrased or tested on those exams. For example, in algebra, a direction on a teacher-made test might be to "solve" an equation. On college entrance exams, the direction would be "to find the solution set over the real numbers such that…." The way the question is asked might cause some students not to connect what they learned in the classroom to what is being tested.

To summarize, using the *BAM*, teachers determine the unit of study and how long it should take to teach. Next, teachers create the specification sheet and assessment blueprint based on district curriculum documents and state standards. Finally, using the *Teacher Expectancies* to ensure balance, teachers create their own unit tests.

Now on to the most important component of the *Backward Assessment Model*—the sharing of ideas, resources, materials, knowledge, skills and teaching strategies.

Educational research suggests that professional interaction—at times informal and teacher driven—is often far more influential than organized professional development, and is more likely to result in changed behavior.

Changes in Instructional Strategies

Experienced teachers should share their knowledge of where students traditionally experience difficulty on a particular unit. Rather than bemoaning the fact students historically have done poorly on those areas, teachers should exchange their knowledge, resources, experiences, and successful teaching strategies with each other. Modifying instructional strategies and/or resources can result in greater student understanding and increased student achievement.

Teachers could increase their content knowledge by using this time to share their understanding of conceptual knowledge and application of the knowledge and skills taught in class.

Teachers might also examine areas in which the district has not performed up to expectation on state and national tests and address those areas of concern. Teachers should also study their most recently administered test to determine strengths and weaknesses of their instruction. Once that has been accomplished, decisions might be made on how best to address those weaknesses during the current school year and how instructional strategies might be changed in future years.

Additionally, teachers should discuss how they will remediate students who are not reaching proficiency on their latest test.

If specific student populations can be identified as doing poorly, the grade or subject level teachers might want to bring into their meetings, ELL, special education, reading or instructional strategists to recommend possible changes in instructional techniques that would be beneficial to those students.

Site administrators should monitor these discussions to ensure teachers are following the Professional Development Day Agenda and determine what changes in instructional behavior are identified so they can then be evaluated. The paperwork of these discussions should include a Specification Sheet, Timeframe to cover the topic, Assessment Blueprint, Changes in instructional Strategies based upon student performance, and a Remediation Plan to address non-proficient students. These documents should be placed in the *Assessment Notebook*.

Additionally, individual teacher assessments should be placed in the Assessment Notebook. It is expected that site administrators would examine those notebooks to determine if teachers are assessing local and state standards, adhering to timelines, to determine if the tests are balanced, and to determine if the tests are fair and consistent within a grade level or subject. That fairness will result in greater portability of grades rather than students being rewarded or punished by inconsistencies within a school or department. While one teacher made decide to have 20 questions on a test, another might decide to have 25. That's okay. One teacher may decide to have four computations, another 6. That's okay. However, if one teacher decided they would not incorporate conceptual development questions – that's not okay. That test would not be balanced. That would also be true if another teacher did not include definitions or procedures. A principal would need to discus these issues with their teachers.

Thoughtfully reviewing an Assessment Notebook provides site administrators a valuable resource in determining the strengths and weaknesses of their program within a grade level or subject. It will also provide suggestions on recommendations and directions that would make their teachers more effective.

BAM
THE ALGORITHM

- **Testing drives instruction.**
- **Teachers make a difference; teachers working together make a greater difference.**

I. To create the *BAM* documents, the teachers will do the following:

1. Teachers meet together by grade or subject to work on selected topics/units.
2. Teachers determine what students are to know, recognize, understand and be able to do within each unit and record those on their SPECIFICATION SHEET.
3. Teachers determine the approximate time (days or weeks) it takes for teachers to teach and students to learn what has been identified on the SPECIFICATION SHEET.
4. Teachers develop an ASSESSMENT BLUEPRINT. A blueprint describes the number and types of questions that should appear on a balanced assessment—not the actual questions.
5. Teacher-made assessments based upon the ASSESSMENT BLUEPRINT will be developed later and placed in an ASSESSMENT NOTEBOOK.
6. The ASSESSMENT NOTEBOOK should contain the SPECIFICATION SHEET, ASSESSMENT BLUEPRINT, EXAMPLES, SAMPLE TEST and TIMEFRAMES.
7. Site administrators should examine the ASSESSMENT NOTEBOOK to determine if the curriculum is balanced and being taught, and if there is consistency, reliability and fairness. For example, would a grade of "B" in one class equate to a "B" in a different teacher's class?

II. The majority of the staff development time should be used to:

1. Discuss areas in which students traditionally experience difficulty.
2. Share knowledge in content, experiences, resources, and materials to help students learn.
3. Share successful teaching strategies that result in increased student achievement.
4. Consult with specialists—ELL, Special Education, etc.—to help special populations be more successful.
5. Create or identify strategies in areas in which students have difficulty on district, state, and national exams.
6. Review teacher-made assessments for balance, consistency, and fairness based on the ASSESSMENT BLUEPRINT.
7. Identify what changes in instruction must occur to increase student knowledge, understanding, and comfort levels in order to increase student achievement.

Site administrators should monitor these discussions to determine what changes in instructional behavior are identified so they can then be evaluated. The notes of these discussions should also be placed in the ASSESSMENT NOTEBOOK.

After each release day using *BAM,* the minimum acceptable work product is a SPECIFICATION SHEET, TIMEFRAME, ASSESSMENT BLUEPRINT, SAMPLE TEST, EXAMPLES, and notes on how to increase student achievement.

NOTE: It is assumed that teachers have read their district curriculum documents.

APPENDIX

Evaluation Form

Southern Nevada Regional Professional Development Program
515 West Cheyenne
Suite D
North Las Vegas, NV 89030

Please respond to the following statements regarding the professional development at your school.

1) What grade level(s) do you teach?
   a) K-2 b) 3-5 c) 6-8 d) 9-12

2) What subject(s) do you teach? (Elementary teacher please choose a,b,c, and d.)
   a) math b) science c) social studies d) English/reading e) other

3) Teachers meet on identified professional development days by grade level or subject to work on selected topic/units.
   a) always b) often c) sometimes d) never e) don't know

4) By grade level or subject, teachers created Specification Sheets to determine what students should know, recognize and be able to do within each unit based on the state standards.
   a) always b) often c) sometimes d) never e) don't know

5) By grade level or subject, teachers determined the approximate time (days or weeks) it takes to teach what has been identified on the Specification Sheet.
   a) always b) often c) sometimes d) never e) don't know

6) By grade level or subject, teachers developed Assessment Blueprints.
   a) always b) often c) sometimes d) never e) don't know

7) By grade level or subject, teachers discussed areas in which students traditionally experience difficulty.
   a) always b) often c) sometimes d) never e) don't know

Please turn over →

8) Teachers shared content knowledge and successful teaching strategies, experiences, resources, and materials related to each unit to increase student achievement.
   a) always b) often c) sometimes d) never e) don't know

9) Teachers consulted with specialists, ELL, and special education, to help special needs students be more successful.
   a) always b) often c) sometimes d) never e) don't know

10) Teachers identified strategies and/or interventions to address areas in which students have difficulties on district, state, or national exams.
   a) always b) often c) sometimes d) never e) don't know

11) Teachers identified changes in instruction that must occur to increase student knowledge, understanding, and comfort levels in order to increase student achievement.
   a) always b) often c) sometimes d) never e) don't know

12) Teacher-made assessments based upon the Assessment Blueprint have been placed in the Assessment Notebook along with the Specification Sheet, Assessment Blueprint, and notes or instructional changes.
   a) always b) often c) sometimes d) never e) don't know

13) Teachers identified students not meeting standards and a plan to remediate those students.
   a) always b) often c) sometimes d) never e) don't know

Comments: On the lines provided please write you school name and location number.

Thank you for you time. We appreciate all that you do to improve student achievement.

Guiding Questions

Addressing Instruction & Student Achievement

With HQSI Correlation

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Class _____HQSI_____Period_____Date_____

Teacher_____

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- How did the teacher prepare for the lesson? (Test Blueprint, Examples, Practice Test, Nat'l Tests, etc)

Preparation

- How did the teacher overtly plan for building success on success?

Preparation, Building Background Knowledge

- How did the teacher plan to and implement positive student-teacher relationships?

Interaction, Comprehensible Input, Strategies

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1. Did the teacher employ a quick, crisp, purposeful review to prepare the students for the day's instruction?

   Review & Assessment, Comprehensible input

2. Did the teacher provide an introduction that would lead to interest/enthusiasm in the day's instruction?

   Preparation, Lesson Delivery

3. How was the daily objective communicated to the students?

   Preparation, Lesson delivery, Building Background Knowledge

4. Were you able to follow/understand the instruction through the concept & pattern development, or linkage in & out of discipline?

   Comprehensible Input, Building Background, Strategies, Lesson Delivery

5. What types of opportunities were students provided to practice? (paced guided, group, independent)

   Interaction, Practice & Application

6. How did the homework support the instruction? (vocabulary, notation, identifications, procedures, reading & writing)

   Comprehensible Input, Strategies, Review & Assessment

7. How was the lesson closed and objective restated?

   Review & Assessment, Lesson Delivery

8. If time permitted, how did the teacher review & reinforce topics or address student deficiencies? (Long term memory review)

Preparation, Review & Assessment, Comprehensible Input, Lesson Delivery

9. What evidence did you observe that simple straight-forward examples provided students were chosen in advance to clarify instruction?

Comprehensible Input, Building Background, Lesson Delivery, Strategies

10. Did student notes support & reflect instruction and could be used to help them study more effectively and efficiently (pacing)?

Strategies, Practice & Application, Building Background

11. How was vocabulary & notation introduced and emphasized?

Practice & Application, Review & Assessment

12. How was reading/writing incorporated in the student learning?

Comprehensible Input, Strategies, Building Background

13. What methodologies did the teacher employ to assist students memorizing important information?

Strategies, Comprehensible Input, Building Background

14. What types of questioning strategies did the teacher employ to ensure student understanding?(directed, highlighting, echoing, cueing, conceptual)

Interaction, Lesson delivery, Comprehensible Input

15. Technology (Appropriate and use of board to develop concepts and patterns)

Practice & Application

16. How were students provided opportunities to apply their knowledge?

Practice & Application

17. How does the teacher prepare their students for a unit test to address student success?

Preparation, Review & Assessment, Interaction, Lesson Delivery

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* How were assessments designed to support increased student achievement? (blueprint, parallel constructed – grade distribution, timely feedback)

Post Observation Protocol

HANLONMATH

1. Go over time-coded notes taken during observation and fill in answers in the Guiding Questions template. I would strongly recommend an observation take place over a two-day period so follow-up of discussions, explanations, and homework can be observed.

2. Review grade distribution, performance on high-stakes tests (district or state), and benchmarks. Take into account student population before coming to any conclusions about teacher effectiveness.

3. Determine the evidence you observed to justify the responses in the Guiding Questions template.

4. Use the responses in the Guiding Question template to determine talking points for the post observation conference.

5. To begin the discussion with a teacher, ask the teacher to identify areas that, in their opinion, went well. If there is agreement, then positively reinforce those and cross them off the list to be discussed. Be sure to include in your remarks specifically why they are being "commended". For instance, *I liked the homework assignment because before you assigned reading, you explicitly taught the vocabulary, connected the reading to prior learning, previewed what they would read and the next day checked their understanding of what was read and corrected their understanding. That writing was assigned as part of the homework that included explanations, procedures or formulas students need to know as well as exercises.*

6. Ask the teachers to identify areas they think might be improved upon. If you are in agreement, especially with priority, then determine the best way to have these addressed. If teacher acknowledges and accepts the recommendation(s), you can provide an oral recommendations or write those as suggestions, recommendations or directions in their evaluations.

7. If the teacher does not identify any areas that can be improved upon, ask "Is this the best you can do?" If they conclude they can not grow any further by improving instruction or assessment, then you will need to be more directive.

8. Identify areas of concern that were not self identified by teacher, discuss your observation and possible remedies, then write these as recommendations or directions, based upon teacher acceptance and acknowledgement of the concern.

9. Close the conference by restating the expectations that were identified at the beginning of the school year and the suggestions, recommendations, and/or directions that are related to the latest observation.

10. After the conference, write the evaluation and have the teachers come back to read and sign.

11. Schedule follow-up observations to determine if suggestions, recommendations or directions are being addressed successfully. Be ready to provide further assistance based on the follow-up observation and conference.

*** In the Guiding Questions document, items 10 and 13, ask about notes and methodologies respectively. A weakness I have observed in many classes deals with procedural fluency. The students are learning to do exercises by repeated examples without the assistance of clear and concise step-by-step procedures. Procedures should be developed as part of conceptual development or linkage, written on the board, copied in the notes, orally recited with a visual link to the exercise, and used to do practice problems, complete homework, and prepare for unit tests. These are language acquisition strategies.