Student Assessment That Works

A PRACTICAL APPROACH

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CHAPTER ONE

Students, Teachers, and Parents as Assessment Partners

If one advances in the direction of his [her] dreams, one will meet with success unexpected in common hours.
—HENRY DAVID THOREAU

Jake Morrison, one of my favorite high school teachers, began every school year with an autobiography bulletin board assignment. Jake and his students displayed marvelous facts and photos of themselves for their first assignment of each year. Everybody got involved. Parents, grandparents, neighbors, and friends helped the students collect their most significant achievements and exhibit them within the bold splashes of color that marked each student's designated bulletin board space.

Jake's celebration of people's lives and talents grew into a tradition in which the entire community wanted to participate. You'd often run into parents, grandparents, and even community members without kids in school, standing around Jake's kaleidoscope of color and prose, bragging together about different entries. Photographs one year showed a boy with his dog during a rugged river raft adventure, three girls on a world hunger tour who won trophies for their state, and an enterprising student setting up his own photocopying business.

Students displayed their best efforts and achievements for the rest of us to admire and to take away for ourselves some personal encouragement. But the real purpose, Jake said, was "to inspire kids by showing them how much they already knew and emphasizing their terrific achievements." In reality, Jake's bulletin board not only highlighted for kids what they could do, but also helped them to identify what skills they still had to learn. You might expect only students' finest achievements to fill their personal display section. But their weaker abilities also found a spot. One student shared an essay relating her disappointment over failing a critical math test after three consecutive attempts. Another young teen wrote an essay describing his terrible shame over failing first grade, while he watched his best friend accept a prize for good grades. Students clustered their displays into categories around their photos. Project titles included: "Most Significant Achievements," "Most Important Efforts," "Interests and Hobbies," "Future Goals and Dreams," and "Questions Related to My Weaker Skills." Some students worked on their designs over the summer in anticipation of the value their displays would bring to the school community. They stitched frames, created collages, wrote stories, and designed posters to tell their stories and to express their gifts in many areas. All this work and quality, despite the fact that no marks were awarded for their fine displays!

In fact, every student who simply filled a bulletin board space with personal information received a perfect score of 10/10. Jake used assessment activities that appealed to his students' sense of worth and confidence as a key starting point for

their year's work together. Jake's students, on the other hand, by beginning their school year with a positive relationship among themselves and between themselves and Jake, found courage and motivation to achieve further. And they enjoyed coming to Jake's science classes, despite the hard work.

Instructions for the autobiography bulletin board assignment were straightforward. The task was to exhibit "personal information," creatively expressed so that others in science class could really get to know you. Students helped one another hang banners, weave ribbons, put up pictures, arrange essays, and complete questionnaires. They showed off families, highlighted birthplaces, illustrated parents' occupations, listed spoken languages, indicated best school subjects, shared job preferences, displayed unique talents, and shared future goals and dreams. Enthusiasm for this project demanded that students' achievements hang on display each year for several months. Not surprisingly, Jake also had a reputation for genuinely listening to his students. He'd include their ideas on science tests and negotiate with them over assignments given. So while kids in some classes dreaded science and feared the exams, Jake's students looked forward to their work together.

Jake's bulletin boards exemplify two facts: that students have a plethora of ideas and experiences to share and that they can contribute wisdom about which assessment activities work best. Unfortunately, though, as Michael Fullan (1993) pointed out, despite teens' excellent ideas, too often nobody's listening. Sadly I was one who had too often ignored students' rich input—simply because I had not thought to ask for their valuable contributions in class. But in recent years, I have made it a priority to ask my students: "What do you think about this test, or that essay assignment?" Their perceptive responses have altered the way I teach and the way I grade. In fact, it is partly because of more student insights and input that Peter Senge (1990) concluded: "What we have learned about teaching and learning in the last 15 years is among the most exciting discoveries of our 200-year history."

Educators take comfort in the fact that new discoveries that have improved the way we teach and learn have also opened new windows into enhanced evaluation practices. There may be fewer discontinuities today between the way students learn and the way schools rate that learning, but we have a long way to go if we are to establish what Gardner (1991) refers to as, "intelligence-fair assessment." The good news is that even our seemingly minuscule steps often create steppingstones toward dramatic results. Although making judgments about what is learned cannot easily be separated from learning itself, we hope to highlight a variety of assessment activities that enhance the quality of learning. Few would disagree that good assessment is tantamount to good teaching. As Peters (1987) reminds us, what gets measured gets learned. When we consider *specific* goals and purposes for grading any student's work, we ask: What should assessment include? How can assessment be made meaningful as a tool for increasing learning and motivation? An equally important question is: Who should be involved?

To address questions about evaluations and increased learning, we'll also need to consider the question: Who can really help, and how? In their keys for reform, Wilson and Daviss (1994), for instance, illustrate the need to recruit and train a new kind of educational measurement specialist:

- *First, such specialists must be experienced and competent teachers. The most effectively structured student assessments will be designed by people with a deep and intuitive understanding of how teachers, students, and materials interact. Evaluators who have a visceral grasp of the classroom's rhythms and*

dynamics also will be far better able to interpret and balance the subjective and objective judgments that make up a thorough program evaluation.

- *Second, those who design the tools of educational measurement must understand that education's effectiveness is swayed strongly by factors beyond the classroom. Students in an upper-middle-class suburb may well respond quite differently to a given innovation than might inner-city minority children. Just as it takes specialists in physics education to evaluate fully the value of an innovative physics curriculum, the best program evaluations will be developed by specialists with intimate understandings of the communities in which those evaluations are being made. In recruiting a new corps of evaluation specialists, education must reach into all sectors of the population.*
- *Third, measurement specialists must work alongside innovators throughout the process of invention. Instead of judging an innovation's efficacy only after teachers and researchers have invested their energy and time to create it, those specialists must weigh and question design choices continually as each innovation takes form. Close collaboration between impassioned designers and cool observers can skirt design problems before flawed concepts waste precious resources.*
- *Finally, educators not only will need to craft precise new ways to determine specific innovations' relative values; they also must devise accurate methods by which to monitor and guide education's approaches to the redesign process itself. School's new emphasis on improving educational processes also means continuing to improve the process of reform. (pp. 154, 155)*

As schools rethink their curriculum and testing practices, many have provided a proliferation of interdisciplinary task ideas, group coaching and many other non-traditional tools. The problem has been that for many busy teachers, there is precious little time to "cover the curriculum" and to ensure students complete their requirements. With budget cuts and larger class enrollments, very little opportunity is left for teachers to shape new, more useful ideas about what it means to express one's knowledge about a topic. And there are other impediments to assessment reform. On the one hand, some educators who remain active in their field make enormous strides toward reforming testing activities based on current information about learning. On the other hand, trying to make significant changes to grading systems over the past decade has felt a bit like riding on a bus while trying to push the bus at the same time. It's almost impossible to do both together, because you cannot dedicate your entire effort to accepting traditional marking systems, nor can you often get free enough to create the significant improvements required.

A few frustrated reformers ask whether assessment will ever work well. This book is, at best, one educator's attempt to show a few new alternatives to assessment, based on many excellent teachers' contributions, that may improve both learning and evaluation. The book represents just a few new pieces of a living mosaic, a few strands woven into a larger tapestry being shaped by many excellent educators. As readers you too will help to decide where colors should change and which patterns should emerge. The book is not meant as an unfair criticism of traditional assessment tools. But if I have learned one lesson, I have learned that to bring about the new, you sometimes have to part with some of the old.

"The Master said: He [she] who sets to work on a different strand destroys the whole fabric."
—CONFUCIUS, Analects, 11.16

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Through community science conferences, Jake's science classroom illustrates how students and parents can become an integral part of a difficult science program. The five-phase method Jake designed for student-led conferences as is follows:

Student-Led Conference Organization

1. After students have selected and begun work on their science projects, it is time to initiate communication with parents and community members about the conference details. A letter home can be created by students in groups of three. The class decides on a winning letter. This letter should: (a) describe the conference purpose to improve communication; (b) show the importance of parental participation in the reporting process; (c) indicate that students will guide parents through the projects completed; and (d) emphasize the purpose of the conference to help students evaluate, reflect, and set goals for their future work.

2. A week or so later, send a family sign-up sheet, restating exact times and location of the conference, and emphasizing the importance of family participation. It is a good idea to hold the conference on at least two or three occasions to accommodate busy families' schedules.

3. As the parents enter the gym or other conference location, provide them with a guide to respond to students' work. This guide sheet can be used later in a three-way student–teacher–parent conference. The form includes a line for the student's name and project title. There are five sections for parent observers to complete:

- Strengths and recent improvements observed:
- Behaviors, work habits, and attitudes observed:
- Areas that still need development observed:
- Goals you suggest for your daughter or son to focus on next term:
- Suggested areas in which the home and school can help obtain these goals:

4. After the student-led conference, invite parents to send letters anonymously concerning their reactions to the conference. Have students write letters to their parents (also anonymously). Publish letters between parents and students in a newsletter sent home. (Perhaps a computer science group would enjoy typing these letters and creating the newsletter.)

5. Send the parents a schedule to sign up for three-way conferences. Forms should include student's name, parents' names, teacher's name, and a choice of conference dates and times. Ask parents to bring observation responses to the three-way conference. Students should have also filled out a similar response following their conference presentation, and prior to three-way conference. You may wish to add these response forms to the student's files.

Before we progress any further, though, it may be useful to distinguish between assessment and testing. In traditional schooling, measurement of learning is typically viewed as an isolated event. But consider the term **assessment,** which comes from the Latin root *assidere,* meaning "to sit beside." Assessment, as opposed to

Dear Mom,

Thanks for coming to my conference. You were eager and interested to learn about the underwater camera I designed. It was good for me to be doing most of the talking this time. Thanks again Mom, I already look forward to next year's student-led conference.

Love, Your Son

Dear Mom & Dad

Speaking for the school & myself, I want to thank you for coming to our student-led conference. The conference was a great success & your presence made it possible. I thought we communicated very well and for me the conference was a personal achievement. Thanks,

Your Daughter

Dear Son,

It's good to be around you as you derive so much pleasure from your projects, accomplishments etc. Please don't go so fast that us ordinary folks can't keep up!
But do keep up the good work!
Most of all keep sharing with us!

love,
Dad

testing, requires collaboration among students, teachers, and parents. The term *assessment*, as it is used in this book, includes the collection of information gathered over time to meet a variety of educational requirements. Multiple indicators are used to assess students' progress from a variety of sources, among which are students, parents, and teachers.

The term **assessment tasks** refers to an illustrative performance opportunity that closely targets defined instructional aims, allowing students to demonstrate their progress and capabilities.

In the context of this book, **assessment** refers to the process of observing learning, collaborating to interpret data and create standards, describing progress, collecting results, recording reflections, scoring performances, and mirroring students' strengths to help them improve weaknesses. Though not always viewed so, assessment is a significant part of any learning process. Although its more traditional function is to measure in order to determine placement, promotion, or graduation, that function has expanded to include a gauge of "students' ability to think, analyze, adapt, and integrate their knowledge and skills" (Wilson & Daviss, 1994, p. 144).

This book is not too much concerned with "institutional accountability," which includes assessment intended to determine a principal's performance, effectiveness of schools, and the like. But the book addresses assessment reform practices like those being championed by Theodore Sizer's Coalition of Essential Schools, a network of 150 diverse and innovative schools. Simply put, this book provides ideas and activities for student performances and exhibitions or mastery demonstrations that are based more on what learners really learn than on what teachers teach.

Many teachers ask: "How can we be sure that students understand the content?" This book demonstrates grading tasks that are closely linked to multiple learning activities. These assessment tools include anecdotal reports, observational checklists, portfolios, written tests (e.g., multiple-choice, short-answer, essay), self-evaluation, oral presentations, interactive presentations, student projects, interviews, student-led conferences, journal, logs, diaries, videotapes, tape recordings, criterion-referenced evaluations, performances, peer evaluations, problem-solving projects, homework, take-home tests, joint goal setting, inventories (e.g., attitude, interest, learning styles), evaluation standards, and achievement tests. Most of the activities described here call for authentic or performance-based tools.

Authentic and Performance-Based Assessment

Parents, teachers, experts, and students who work closely together can introduce students to real-life adventures and help them to solve meaningful problems. The term **authentic assessment** refers to evaluations of student performances in a real-world context. Tasks used in authentic measurement are viewed as meaningful and valuable central experiences of the learning process. A student might reassemble a motor in order to illustrate working machine parts, or analyze real case studies to show the interaction of medical intervention with malaria patients. Traditional approaches, in contrast, would emphasize memory of motor parts, body parts, or malaria characteristics. Implications are that assessment is part of learning, that it is ongoing, and that success or failure is determined by using concrete evidence that demonstrates students' ability to apply knowledge and skills in new situations over time. In Part Two, authentic assessment practices are detailed further.

Like authentic assessment, **performance assessment** asks: How do we know what they know? In performance assessment, student performance of an educational objective is observed and rated, often over time. Students should be aware of the performance criteria or standards by which their performance is being evaluated. Clearly stated performance criteria provide students with critical information about expectations. This clarity also gives students a goal to strive for.

In both authentic and performance-based assessment, tasks are usually:

- Contextualized
- Integrative
- Metacognitive (require students to think about their thinking)
- Related to the curriculum taught
- Flexible (include multiple demonstrations of knowledge and skills)

Both authentic and performance-based assessment tasks usually require:

- A variety of applications
- Self-assessment
- Peer assessment
- Specified standards and criteria
- Outcomes at regular stages
- Self-reflection and intrapersonal introspection

Evaluation, which includes authentic assessment, requires a demonstration of behavior that can be measured against a model of excellent performance. In other words, it is usually accompanied by performance-based assessment, which also includes ongoing observation. The creation of products or solution of problems often is required in both. Both authentic assessment and performance-based assessment involve a real-world performance with relevance to the learner, to the learning community, and to the content taught.

In a math class, authentic assessment might require solving a real-world problem, using a given formula and set of integers. Students would be required to use the formula and the integers provided to determine the value of a variable in the formula. These problems might be placed on cards, and students would work in groups of three, with problem cards to compute for the unknown variable. The problems would deal with real-life situations—for example: "Students must travel 20 miles to camp and have only 10 minutes to get there. How fast must they drive, and would there be a speeding infraction?"

Each problem card contains a different problem, with a formula provided to compute for the unknown variable. When a group completes the solution correctly, they are given another problem card. Groups completing the most problems correctly in a given time win a prize. Students then read their problems and explain their solutions to the rest of the class. Students can participate actively in their own learning and assessment in this way. They can also help one another and confer with adults. This chapter will describe roles of each participant in any authentic or performance-based assessment process, beginning with the students themselves.

According to Herman, Aschbacher, and Winters (1992), there are ten key issues to consider in any quality assessment:

1. Assessment must be congruent with significant instructional goals.
2. Assessment must involve the examination of the processes as well as the products of learning.
3. Performance-based activities do not constitute assessment per se.
4. Cognitive learning theory and its constructivist approach to knowledge acquisition supports the need to integrate assessment methodologies with instructional outcomes and curriculum content.
5. An integrated and active view of student learning requires the assessment of holistic and complex performances.
6. Assessment design is dependent on assessment purpose; grading and monitoring student progress are distinct from diagnosis and improvement.
7. The key to effective assessment is the match between the task and the intended student outcome.
8. The criteria used to evaluate student performance are critical; in the absence of criteria, assessment remains an isolated and episodic activity.
9. Quality assessment provides substantive data for making informed decisions about student learning.
10. Assessment systems that provide the most comprehensive feedback on student growth include multiple measures taken over time. (p. 13)

Students as Active Participants

Renate Caine (Caine & Caine, 1997) tells Jeremy's story:

> *. . . Jeremy is sitting across the room from me. We begin to talk and he tells me he is there because he yelled out in math and bothered the other students. I asked him why he did this. He explains that the lesson was too simple for him—that he was bored and thinks that adults think they can just dish out any boring old thing and kids will just do it. (p. 82)*

Would Jeremy's behavior have improved if he had been consulted on the problems of math boredom? Would he have caused problems for others if he had found a challenge for his own academic abilities? He was obviously more than able to cover the material. But because he was not given responsibility, nor was he made an active participant, he settled for behavior problems to fill his time in class.

The teacher could have identified Jeremy's boredom problem with a simple Math Interest Survey designed to communicate students' interests, abilities, and problems. Here is an example of one such survey that might be used to flag a student's prior disposition and current expectations:

Name: _____.

Date: _____.

Class: _____.

Math Interest Survey

1. Three words that describe math are . . .
2. Math affects my life by . . .
3. My best experiences in math class are . . .
4. What I most enjoy about math is . . .
5. When working a math problem I . . .
6. One frustration with math is . . .
7. One thing I do not enjoy in math class is . . .
8. One contribution I would like to make in math class is . . .
9. If I could change one thing about math class, I would change . . .
10. In math class I would like to do more . . .

An interest inventory can be kept in student portfolios as an indicator of students' progress and enjoyment of the work. Inventories provide a vehicle for collaborating with students. Some teachers use interest inventories for each subject taught in order to determine a student's prior knowledge and experience, and to identify and flag problems. The interest inventory provides a meaningful instrument to begin a discussion with any student concerning her progress in class. It can also be used to set goals for improvement or to alter curriculum to accommodate a student's unique talents and interests.

Students I interviewed during my doctoral work provided amazing insights about how their schools either promoted or shut down learning and motivation. Out of many conferences with students in every discipline came my two books, *Creative Learning* and *Roundtable Learning* (Zephyr Press). And students continue to teach me! No longer can I ignore their critical views, because they have shown me how much wisdom they can contribute to our learning and teaching practices.

In the National Association of Secondary School Principals' (NASSP) June 1997 issue of *Schools in the Middle,* students were invited to share their insights in a dynamic collaboration between Episcopal Social Services and selected sites within the New York public schools, called Network in the Schools (NIS) (Tobias & Turner, 1997). The idea behind this group is that really listening to kids is the lead into their improved academic achievement. Robert Jackson, a thirteen-year-old, commented: ". . . my dream is to be an author. I like myself because I helped my friend find his jacket that he had lost in the lunchroom. I felt good about this, because I usually don't help anybody unless I get something for it, but this made me feel good and I like this feeling a lot." William Anderson described his personal progress: ". . . my dream is to become a scientist so I can find a cure for cancer. I feel good about myself today, because I am really learning how to solve my own problems. I know this because today, I came straight to school instead of hanging out with my friends and when I did this I really felt good about myself and I felt strong, and I like this feeling better than how I feel when I cut school" (p. 33).

When we listen to youth, we not only learn a great deal from them, but we grow in respect and appreciation for their interests and abilities. We find ourselves committed to helping them to learn successfully. The Network in the Schools program concluded that such collaboration with students helped them in a variety of ways:

> *Most young people agree that the NIS experience relieves pressure caused by fear of failure, unhealthy competition, and ridicule by their friends who are "gifted" and "talented." Most teachers agree that the affective improvement is caused by an accumulated effect of positive, cooperative relationships fostered by the structured activity provided by NIS. This experience empowers children with a sense of confidence and assurance that they can succeed. (p. 38)*

Turning Boredom into Challenges

What student who is actively involved in choices about her learning activities is bored? Similarly, when students become active participants in choosing their projects, setting criteria for their outcomes, and contracting for the terms of their work, they begin to link evaluation to their larger educational purposes. With students as active partners, assessment provides far more than mere numerical test scores. Students are challenged to think about processes and goals, and they are motivated to learn.

Vito Perrone (1991) found that "when students had sustained opportunities to be active participants, to review for example their own writing over time, they became increasingly more articulate about their progress, and what they needed to work on to improve their performance and enlarge their understandings" (p. 166). Another way to challenge and motivate students is to relate assessment activities to their real-life experiences.

For instance, students often enjoy sharing personal or interpersonal information if they are provided a structure within which to articulate ideas. To include students' ideas in the classroom, teachers and students must get better acquainted. Biopoems provide one such structure, which helps students to reflect on their unique characters and to articulate their proclivities within a learning community. A biopoem structure looks like this:

Biopoem Structure

Line 1: First name _____.

Line 2: List 4 traits that describe character: _____, _____, _____, _____.

Line 3: Relative (e.g., brother, sister, daughter) of _____.

Line 4: Lover of (list 3 things or people): _____, _____, _____.

Line 5: Who feels _____ (3 items).

Line 6: Who needs _____ (3 items).

Line 7: Who fears _____ (3 items).

Line 8: Who gives _____ (3 items).

Line 9: Who would like to see _____ (3 items).

Line 10: Resident of _____.

Line 11: Last name _____.

The biopoem structure also provides a good starting point for collaborating with students. These can be illustrated or clipped to personal photographs and displayed in class. Students may enjoy sharing with parents, or parents may wish to complete a biopoem for sons and daughters to be placed beside the student's version. The idea is to create structures for interaction, and sharing biopoems is a good place to start.

Too often in the past, boredom has been seen as a necessary evil in learning. Today, we know more about how students enjoy expressing their knowledge in various ways. How has this fact influenced the way we measure learning? Recent trends in assessment, according to Herman, Aschbacher, and Winters (1992), include changing the way we envision learning and assessment:

1. *Changes from behavioral to cognitive views of learning and assessment:*
   - *From sole emphasis on the products or outcomes of student learning to a concern for the learning process.*
   - *From passive response to active construction of meaning.*
   - *From assessment of discrete, isolated skills to integrated and cross-disciplinary assessment.*
   - *Attention to metacognition (self-monitoring and learning to learn skills) and cognitive skills (motivation and other areas of affect that influence learning and achievement).*

- *Changes to meaning of knowing and being skilled—from an accumulation of isolated facts and skills to an emphasis on the application and use of knowledge.*

2. *From paper and pencil to authentic assessment:*
   - *Relevance and meaningfulness to students.*
   - *Contextualized problems.*
   - *Emphasis on complex skills.*
   - *Not single correct answer.*
   - *Public standards, known in advance.*
   - *Individualized pacing and growth.*
3. *Portfolios: from single-occasion assessment to sample over time:*
   - *Basis for assessment by teacher.*
   - *Basis for self-assessment by students.*
   - *Basis for assessment by significant others (parents, etc. where appropriate).*
4. *From single attribute to multidimensional assessments:*
   - *Recognition of students' many abilities and talents.*
   - *Growing recognition of the malleability of student ability.*
   - *Opportunities for students to develop and exhibit diverse abilities.*
5. *From near exclusive emphasis on individual assessment to group assessment:*
   - *Group process skills.*
   - *Collaborative products. (p. 13)*

When actively involved in choices about assessment, students generate challenge and motivation that go beyond mere mechanics or numerical test scores. They are challenged to reach for individual processes and motivated to strive for personal goals.

Students as Autonomous Learners

Because students are the focus of most school reform efforts, it only makes sense to involve them in their own learning and assessment. Students I interviewed for the development of the MITA (Multiple Intelligence Teaching Approach) model (Weber, 1995) appeared to be very much aware of their personal strengths and weaknesses and articulated a genuine enthusiasm to assume responsibility for their learning. Whenever student autonomy is raised, a few teachers invariably ask what to do about the "lazy" student who sets low goals and completes as little work as possible. This is a good question, prompting more discussion about interactions with "lazy" students as well as an attempt to learn about students' strengths and anxieties. Personally, I have never met a lazy student in thirty years of teaching, but I have met frustrated, bored, and fearful kids. I have also met some kids who struggled against incredible odds that sometimes overwhelmed them in class.

The students I talked with, on the other hand, typically articulated that increased authority to choose what and how to learn also increased their learning opportunities. This fact should come as no surprise. According to Stumbo (1989), Taylor (1991), and Lieberman (1992), students who are given more authority in school usually become autonomous, independent learners. Stumbo calls for increased student voice in the classroom, with more flexibility to extend their curriculum activities beyond

the rigid setting in class, where traditionally students sit and listen while teachers talk. Taylor refers to the student benefits when mutual respect exists between teachers and students. And Lieberman describes the advantages to students within academic communities.

A variety of approaches to knowledge open new avenues for students to contribute their unique proclivities within community. The key, however, is to assess multiple-intelligence activities using a rubric (a scoring guide that defines the specific criteria used to assess) that extends beyond traditional paper-and-pencil tests.

Consider the following unit plan idea on the topic "solving algebraic equations." Students are expected to solve equations through a variety of modes, then to explain and apply their concepts to solve new equations, using similar processes.

Learning activities are closely associated with assessment strategies. Following are illustrated learning activities using a MITA model approach.

Linguistic

Read and discuss textbook information, making brief notes on key information describing the process of solving equations.

Visual-Spatial

Create a visual chart that graphically illustrates the process you used to solve equations.

Musical

Create song lyrics to the tune "Snowbird," illustrating distributive, commutative, and associative laws.

Mathematical-Logical

Solve equations for an unknown entity showing mathematical progressions and sequences.

Bodily-Kinesthetic

Demonstrate, using stones and balance scales to represent numerical values of each side, how the equation would balance on the scales.

Naturalistic

Illustrate your main points using artifacts or examples found in nature. Show its influence on the natural environment.

Intrapersonal

Write a brief report about how you discovered the best process to solve equations. What challenges did you face? What new information did you learn?

Interpersonal

Discuss textbook information and your solutions to solving equations with a partner. Did you differ in your methods and responses? What did you learn from one another?

Assessment for these activities should follow a rubric for grades assigned. For instance, the sequential flowcharts should include all major steps required to solve equations. Each step may be assigned a grade value. Similarly, the song lyrics should be assigned a grade for each of the laws illustrated correctly, and so on. Some of the activities could be electives, and others could be accumulated in math portfolios.

Teacher as Knowledge Broker

To teach well, teachers must know and practice strategies generated from current research about how we learn best. Teacher education and school practice are beginning to form partnerships in schools and universities. The idea of supporting and mentoring new teachers and of sharing the moral responsibility for school renewal is catching on in the most progressive schools. The challenge is to support teachers in this partnership and to encourage their initiatives.

A teacher who reflects on each lesson or unit is able to abandon less effective practices in exchange for those that precipitate knowledge. A group of teachers and myself created a reflective checklist for teachers who wish to improve their practice in order to increase student learning and enjoyment. You may find the "Reflective Guide for Teachers" useful for your own reflections. Some teachers file these at regular intervals, or with lessons they will teach or assess in the future.

Reflective Guide for Teachers: Questions That Will Prompt More Effective Learning

It is always a good idea to begin your reflection by jotting down what went well before you consider possible changes.

List three aspects of your lesson that went really well:

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-
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List three things you will change in future. How? What will you do differently?

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-
-

Reflective questions concerning ***content:***

1. What main goal did my lesson cover?
2. Which content did students learn well? Why?
3. Which content did students not learn? Why?
4. What would I do differently in future?
5. Was my content interesting and appropriate for this class?
6. Did students have the necessary background knowledge?
7. What will the future development of this lesson be?

Reflective questions concerning ***delivery:***

1. How much time did I spend talking?
2. How much time did the students talk?
3. Who talked most? Why?
4. Are there additional activities or questions that would have helped the students to discover more?
5. Am I *telling* students or *asking* them?
6. How did I motivate students for this particular lesson? Did my motivational strategy work? Why or why not?

General reflective questions:

1. How did (any) one advanced student feel sitting in my class?
2. How did (any) one weak student feel sitting in my class?
3. What did most of the students think of the lesson? Why?

You may also use this set of questions as a reflective guide for a peer observation, in order to gain a colleague's ideas and suggestions for your lesson or unit. The key is to begin with positives, so that additional suggestions for change will come into perspective.

As knowledge brokers, teachers have a responsibility to facilitate partnerships with others in the learning community. The future of our schools depends on the creativity, intellect and drive of teachers. Today's teachers need to be aware of changing knowledge about the brain's functions, the team of community members who can act as resources, and the vision required to develop an emerging agenda that focuses on effectiveness and productivity rather than on deficits and failure.

Teacher as Senior Scholar

Teachers are also senior scholars in their field, especially when compared to their students, who are novices. As content experts, teachers will play a growing role in reshaping and improving assessment practices. Few would argue that we need creative ideas to ensure that today's youth will succeed. But if we consider the congressional reports that offer predictions about significant increases in the growth of minority populations, teachers will look beyond the backdrop of any one societal or economic population and will embrace cultural differences. Not only do teachers need to have substantial subject matter knowledge and be equipped with state-of-the-art training to foster improved student learning, but they also must think about the nature and proclivities of learners, especially about their cultural differences, their critical need for community acceptance, their differing needs, and the multiple ways to engage students with substantive ideas.

For teachers to possess the skills, methods, and scholarly and philosophical principles necessary to teach a wide variety of learners, they must think strategically about intellectual differences. They need to design and implement curriculum that reflects all the knowledge about teaching and learning that is at our disposal today. But teachers are already overworked. They cannot proceed alone. To improve the quality of education, teachers also need to form dynamic learning relationships with students, parents, and the community.

Teachers are the key to addressing every student's special abilities, and this is not so difficult when you think of assessment strategies according to Gardner's (1983) multiple ways of knowing, which include verbal-linguistic, visual-spatial, logical-mathematical, bodily-kinesthetic, musical, interpersonal, intrapersonal, and naturalistic. Teachers as resource guides or senior scholars can offer a wide variety of assessment opportunities for their students, or younger scholars. Following are some assessment suggestions for Gardner's multiple intelligences:

*For **verbal-linguistic** assessment, students:*

Fill in missing words from key articles or texts.
Read prepared material to class.
Tape record an original speech.
Tape record a mock interview.
Orally interpret a passage.
Debate.
Storytell.
Write creatively.
Write a poem.
Read chorally.
Write essays.
Write journals.
Complete verbal exams.
Conduct conferences to exhibit work.
Design personal books.
Keep diaries.
Answer questions on a topic.
Lecture peers.
Complete oral or written reports.

*For **visual-spatial** assessment, students:*

Paint.
Draw.
Create maps.
Use globes.
Collect photos.
Develop photos.
Engage in or create related games.
Create sculptures.
Role-play on video.
Imagine and illustrate scenarios.
Make models.
Create 3-D objects.
Make dioramas.
Design mobiles.
Create posters to defend or refute topic.
Display bulletin boards.
Decorate windows.
Design a building.
Create a software program.

*For **logical-mathematical** assessment, students:*

Create symbolic solutions.
Work math formulas.
Outline text chapters.
Work with graphs.
Use tables.
Solve problems using a calculator.
Do worksheets with hidden messages.
Solve numerical problems.
Teach abstract material to peers.
Substitute abstracts for concretes.
Use values to find solutions.
Translate common patterns and themes.
Complete multiple-choice exams.
Create problem worksheets.
Keep schedules.
Solve word problems.
Experiment.
Show cause-and-effect relationships.
Use statistics and numbers creatively.

*For **musical** assessment, students:*

Show voice and tonal patterns.
Prepare classical background music.
Report on operas.
Describe jazz or swing background.
Present musicals.
Create a music video.
Design a music composition.
Sing in a group.
Perform solos, duets, or trios.
Incorporate environmental sounds.
Describe instrumental music.
Hum melodies.
Whistle.
Demonstrate music vibrations.
Create songs to aid memory work.
Perform original lyrics.
Write music to appeal for a worthy cause.
Integrate music and learning.
Use rhythm and rhyme creatively.

*For **intrapersonal** assessment, students:*

Write personal reflections on a given topic.
Keep a journal on class discussions and readings.
Demonstrate personal practice schedules.
Do individual projects.
Make a presentation of your ideas and proposals based on personal ethics.

*For **bodily-kinesthetic** assessment, students:*

Plan field trips to museums.
Design an outdoors lesson activity.
Visit libraries and historical sites.
Create drama.
Do martial arts.
Use body language.
Engage in sports.
Do related games and performances.
Hold a coffee house for the community.
Do mime.
Create and invent products.
Conduct labs.
Do folk or creative dance.
Complete take-home tests.
Design learning centers.
Create interactive bulletin boards.
Make presentations.
Use math manipulatives.
Do physical exercise.

*For **interpersonal** assessment, students:*

Pair-share ideas and solutions.
Give feedback to peers.
Participate in small groups.
Interact with larger groups.
Interview an expert.
Team-teach a concept.
Collaborate in classroom decisions.
Prepare student-led conferences.
Proofread a peer's essay and write an evaluation.
Collaborate with teacher on project.
Describe motives of others.
Show ethical choices of leaders.
Involve family and community in work.
Write group response logs.
Create a business proposal.
Design a listserv.
Join a discussion group.
Describe a special-interest group.
Illustrate conflict resolution ideas.

*For **naturalistic** assessment, students:*

Collect data from nature.
Label specimens from natural world.
Organize collections.
Sort natural data, categorize and classify information.
Visit museums.
Communicate with natural historic sites.

Write personal stories.
Create a timeline of your life—show achievements and failures.
Write an autobiography.
Publish a personal book.
Illustrate emotional processes.
Complete an interest inventory.
Illustrate goal-setting strategies.
Complete a self-evaluation on a topic.
Keep a personal response log during reading of text.
Design personal portfolios.
Compare motives and moods of another to one's own.
Create a personal scrapbook.
Demonstrate research about natural problems.
Complete experiments from nature.
List vocabulary used to describe natural data.
Compare naratives from expert naturalists.
Illustrate use of magnifiers, microscopes, and binoculars.
Photograph natural patterns and comparisons.

Using these assessment opportunities, teachers can guide students to express various ways of knowing any topic. When teachers step aside from delivering knowledge in one "package" or assessing what students know through rigid tests, they can broker their students' gifts and abilities to demonstrate unique ways of knowing. As senior scholars among a group of novice scholars, teachers welcome input from other teachers and from their students as learning partners.

Teacher as Partner in Learning

Teachers who offer encouragement and helpful suggestions often receive many benefits in return. Increasingly, the role of the teachers is defined as helping students activate their brains, rather than as "givers of knowledge." We have come a long way since Goodlad (1984) wrote:

> *We do not see in our descriptions of classroom activity . . . much opportunity for students to become engaged with knowledge so as to employ their full range of intellectual abilities. And one wonders about the meaninglessness of whatever is acquired by students who sit listening or performing relatively repetitive exercises, year after year. Part of the brain, known as Magoun's brain, is stimulated by novelty. It appears to me that students spending twelve years in the schools we studied would be unlikely to experience much novelty. Does part of the brain just sleep, then? (p. 231)*

Still, we have a long way to go, if learning is, as Goodlad implies, dependent on a student's ability ultimately to relate his or her own capacity to activate individual abilities and interests in the learning process. More teachers have listened to the educational gaps described by experts like the architect Jack Diamond, who recently designed the city hall civic center in Jerusalem. During an interview after the center's construction, Diamond lamented that schools have failed to teach spatial literacy. Unfortunately, unless we partner with experts in many fields, students will continue to lose out. We will continue to fail to teach and assess for learning that really matters to students and to society. Within our pool of experts, parents could become our closest partners. Think of the expertise and experience parents add to our work with their children. But, like other experts, parents, too, complain that they feel excluded from participation in their children's progress at school. Fortunately, however, more schools have begun to welcome parents.

Parental Participation

Rather than assume that parents don't care about their children's progress, teachers have begun to consider the barriers to parental involvement at school. For many parents, their own personal school experiences create obstacles to involvement. Parents who performed poorly or who dropped out of school may not feel confident in many school settings (Finders & Lewis, 1994). One father described his son's school progress this way:

> *They expect me to go to school so they can tell me that my kid is stupid or crazy. They've been telling me that for three years, so why should I go and hear it again? They don't do anything. They just tell me my kid is bad.*
>
> *See, I've been there. I know. And it scares me. They called me a boy in trouble, but I was a troubled boy. Nobody helped me because they liked it when I didn't show up. If I was gone for the semester, fine with them. I dropped out nine times. They wanted me gone. (Finders & Lewis, 1994, p. 51)*

This father's personal failure at school prevented him from helping and supporting his son. But must a parent's negative experience or limited schooling rob the confidence needed to help a son or daughter?

Several myths keep some parents from greater school involvement. Parents claim:

- I don't know enough about the curriculum.
- I can't make any difference.
- I don't see how my faith fits into the public schools.
- I wouldn't want to stir the waters.
- I wouldn't be made welcome.

According to Finders and Lewis (1994), we need to focus on creative ways to draw parents into our schools. They suggest: "If we make explicit the multiple ways we value the language, culture and knowledge of the parents in our communities, parents may more readily accept our invitations" (p. 54).

The more parents get involved in their children's education, the more success students enjoy. When parents work closely with faculty and school personnel, students begin to sense a more meaningful future for themselves. In fact, schools that report increased parental involvement also report this benefit to the entire school community. Surprisingly, even those students whose own parents do not get involved do better when there is more parental input. It follows that, if we neglect to involve parents, we also keep schools from performing as successfully as they should. On the parents' part, they enjoy a process that involves them in decisions shaped through the process of consensus building. When they are involved in conflict over various issues, parents benefit from working toward solutions that meet more students' needs.

The U.S. national educational goals require that every school promote parent–school partnerships in order to increase parental involvement in the social, emotional, and academic growth of their children. Research has indicated that increased parental involvement is associated with higher mathematics and reading scores. In contrast, lower levels of parental involvement increase the likelihood that a student will be suspended or expelled from school. In the past, parental involvement

often was limited to extracurricular activities. But in highly successful schools, that is changing, and parents form a significant part of the school's support system.

Kettering Middle School, located in Upper Marlboro, Maryland, constructed its entire governance system around the concept of parental involvement. Visitors are greeted in the entranceway with a bold banner proclaiming, "AT OUR SCHOOL . . . parents are important!" In an effort to maintain partnerships with parents, Kettering school created home–school communication systems. Parents are contacted regularly about school programs and student issues. A recent survey, one of a regular series, had an 80 percent return rate.

Kettering School maintains that parents' participation is essential for students' academic success. Parents visit at least one class each semester, meet with an academic team each semester, sign homework, create a solid learning environment at home, discuss school activities, and participate in course selection. Parents and the school have agreed to enforce a sustained homework time of 6:30 to 9:00 P.M. each night. As expected, parental involvement has helped raise student grade point averages and test scores.

In Kettering School, contracts are signed by students, parents, and teachers, who all agree to meet set expectations. Partnerships go beyond academic work to include collaborative work on such issues as alcoholism, single parenthood, children with disabilities, and latchkey children. In each of these programs, parents are an integral part of the learning community. Kettering is only one example of the many middle and high schools that increasingly recognize the vital role of parents as partners in the educational enterprise.

Parent Partnerships

Through partnership projects, schools are developing a positive attitude toward parental involvement. These partnerships demonstrate respectful attitudes, which include:

- Greater respect for people and their opinions
- Listening that is nonjudgmental
- Conflict resolution training
- Openness to diversity of culture and abilities
- Genuine partnerships that set a positive school atmosphere
- Practicing mutual trust and encouragement

In the past, schools were hesitant to invite parents into equal partnerships. Parents were rarely part of the school decision-making process, and family involvement tended to drop off drastically by the time students reached high school. But now more than a thousand schools across the United States have adopted the Transparent School Model, which uses electronic telecommunications technology to connect students, teachers, and parents. Teachers often record daily classroom agendas and list homework assignments and related activities that can be done at home. A voice-messaging system uses auto-dialing features that place calls in many languages to parents to enable them to prepare for upcoming events or to make regular announcements.

Schools using this model have reported up to an 80 percent increase in parent involvement as well as significant increases in student grades. Once in place, the system is very user-friendly and for many schools has extended yet another hand to parents for their active involvement in decision making and collaborative activities. Those schools that accommodate parents' ideas and contributions express enthusiasm and a sense of success. One teacher, talking about the partners' efforts to bring together diverse sets of students, added, "How could we have done this without the active involvement of their parents?"

Parents have been particularly helpful in working with students and teachers to help students organize their time. Many students lead busy lives before and after school. They need help keeping track of assignments, managing their time, and organizing their personal and academic responsibilities. Parents and teachers who work together can help students work more effectively.

For example, you might send a note home whenever students are given a major assignment. A typical note simply explains the assignment and lists appropriate expectations, which usually are agreed on between you and your students in advance. Make a time for questions from students and parents to ensure that all students understand and can establish a routine for completing the assignment. A ten-minute session can be provided for students and parents together to brainstorm their concerns and ideas before reconvening for the large-group discussion. Suggestions may be raised at this point. For example, if you decide to use a personal planning calendar, you might have one student or parent draft a copy that would help students to follow the study agenda for the coming term. Or you might provide ready-made agendas. You may wish to describe the specific events that will be occurring in their school agenda. This information will capture students' interest and encourage them to fill in their own private agendas as well. Students can begin their calendars with their parents present and then be given five minutes twice a week to update them. They can use color coding to mark holidays, assignments, and test dates, for instance. Over one term, many students will be well on their way toward a valuable time management scheme of their own, simply by using this one study management tool. Once established, it is crucial to use the planning calendar as an integral part of the program so that students can learn the value of planning on a regular basis, both in and outside of class.

Parents might initial calendars weekly to ensure that students are keeping up. When students fall behind on an assignment, they can check their calendars for missed work, take the steps to catch up, and make sure they hand in their work to be graded. Calendars also can be used for personal records of achievement, as well as records of daily activity. In fact, graphic organizers might be produced in order to expand calendar items, so that students and parents can chart their achievement in visual graphs like the one shown in Table 1-1.

This is an ideal way to help students and parents plot and follow progress in any subject. After every assignment, students can be given a brief time to plot their grades. For many students, this visual map of their achievements adds motivation and a sense of direction for successful future assignments. It helps teens to shape their vision and advance their abilities.

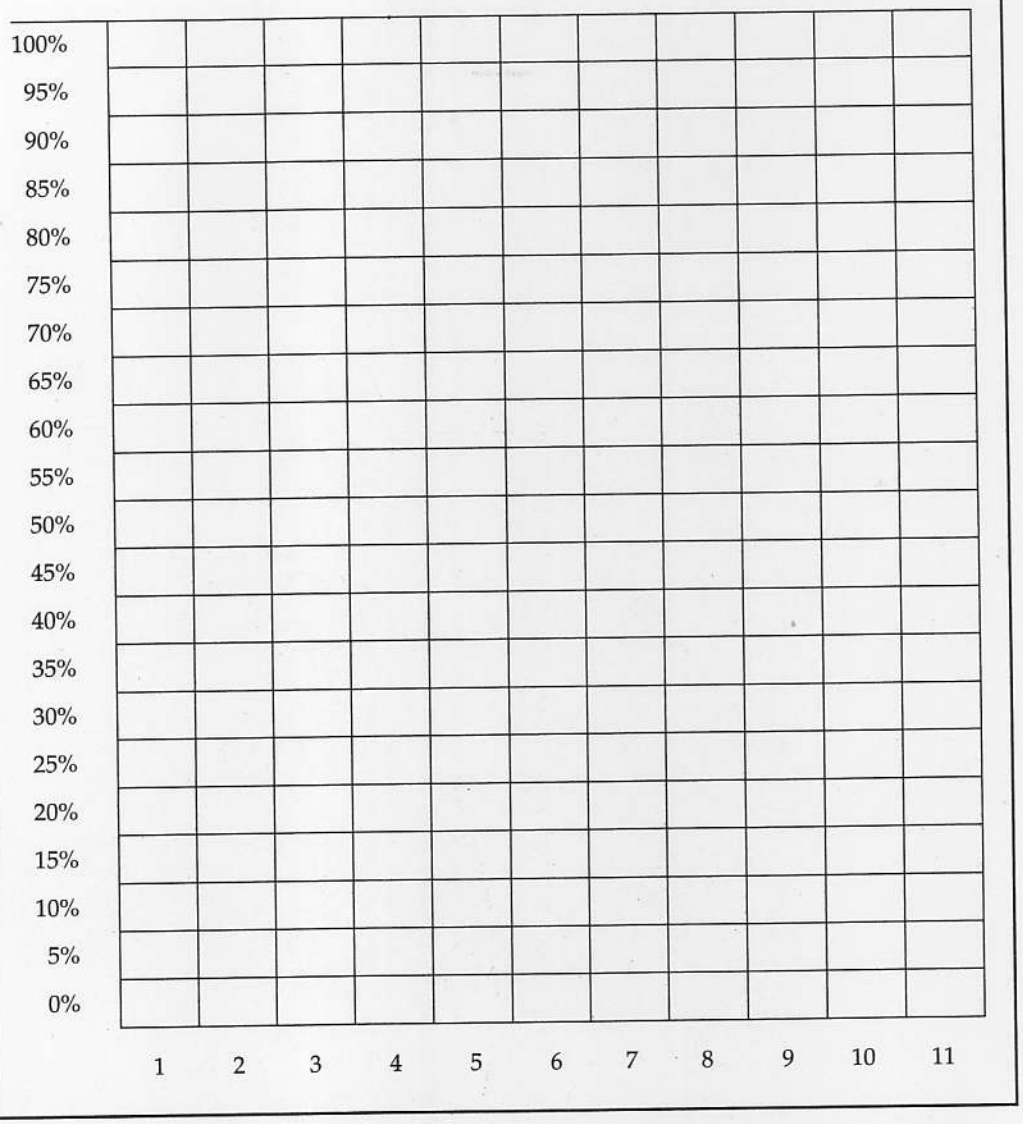
As Henry David Thoreau reminded us, people who move toward their dreams usually encounter success. Jake's bulletin board advanced students toward their highest dreams. By beginning the school year with an autobiography bulletin board, Jake replaced rigid science tests, which students traditionally worried about passing, with assignments celebrating each student's life and talents. He began his year by taking a look at what students have achieved, and involving their families in

TABLE 1-1
An Achievement Graph

Achievement Graph for _____ Class

Name: _____

Section: _____



that process. Jake's students, by inviting parents, grandparents, and community members to visit their kaleidoscope of color and prose, gained confidence and courage. They were motivated to work hard for continued good grades in their upcoming science assignments.

TABLE 1-1
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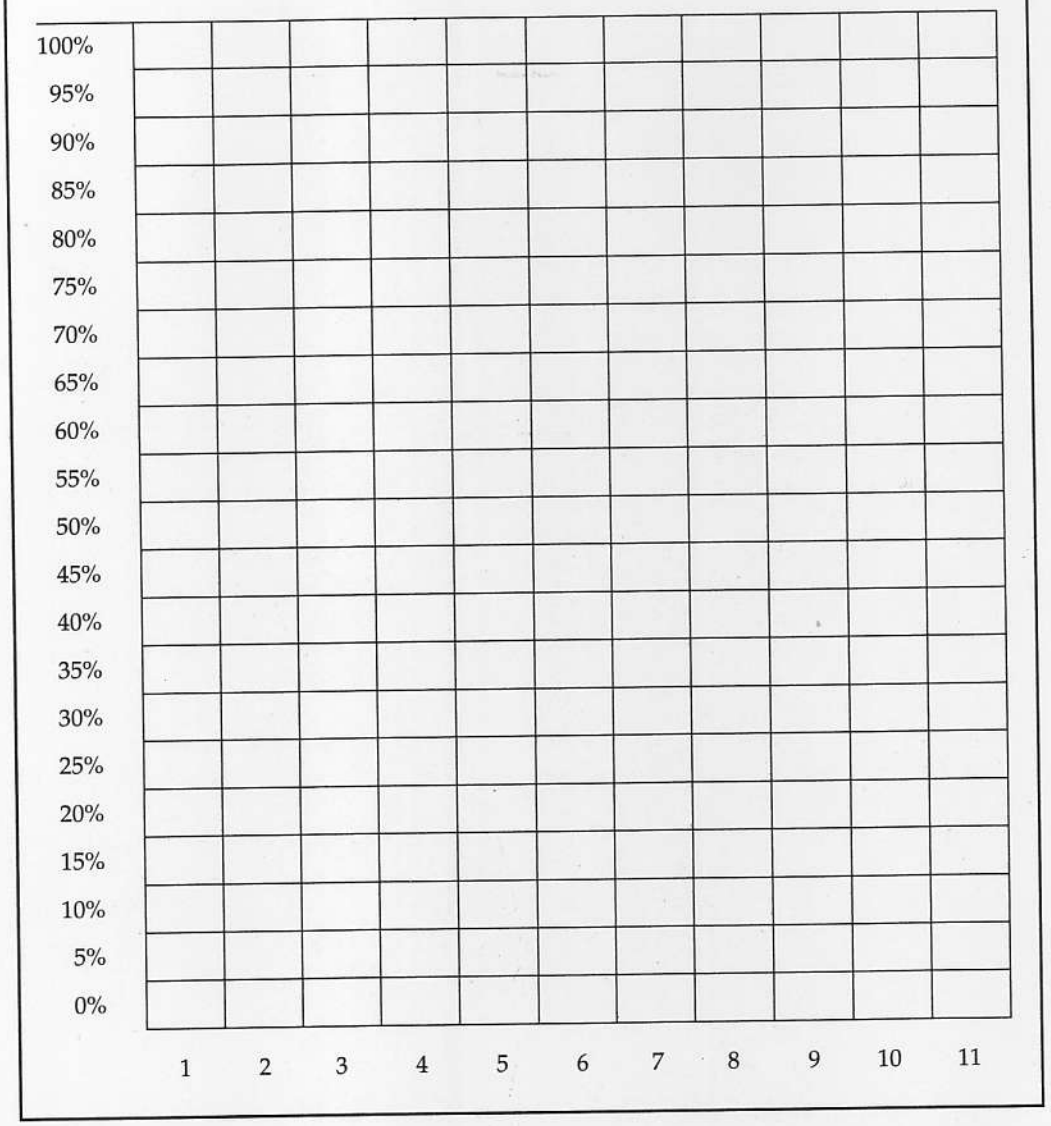

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