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Overview

The Current Assessment Climate

The current climate of high-stakes accountability in North Carolina and throughout the nation naturally focuses school administrators and teachers on assessments that measure student achievement for accountability purposes. While classroom assessment has always been an important element of instruction, it takes on a special urgency in today's high stakes environment. In this environment, many teachers are tempted to de-emphasize day-to-day assessment to focus on assessment tools more obviously linked to accountability measures - in this case North Carolina's End-of-Grade and End-of-Course Tests. When this shift occurs, classroom assessment becomes narrowed and looks more like multiple choice (or other selected choice) tests used at the state level. Instruction and classroom activities also become limited to only those parts of the curriculum that are tested. Writing instruction, for example, becomes narrowed in an attempt to mirror the writing prompts used on writing tests at grades 4, 7, and 10.

It is easy to understand why the high-stakes consequences of our ABCs Accountability Model lead many school staff to believe that it is essential to focus on assessments that resemble state assessments. The thinking goes, "If we do not teach and test in the classroom the way the state tests, we will not make expected growth on the ABCs." However, this thinking limits the learning opportunities for students, the likelihood of mastering the North Carolina *Standard Course of Study* goals and objectives, and the rich possibilities for using assessment as a teaching tool. While schools may well achieve expected or exemplary growth by narrowing the teaching and testing focus to resemble state assessments, this approach is short-sighted. In addition, there are many schools making exemplary growth that are *not* limiting teaching and learning in this way.

The North Carolina Department of Public Instruction is committed to continued development of quality teaching and on-going classroom assessment as essential preparation for students to master rigorous content and performance standards as defined by the *NC Standard Course of Study in Mathematics*. We believe the strategies that engage students in self-assessment, greater ownership of their learning, communicating, reasoning, problem posing and problem solving result in long-term growth and learning.

Thus, this resource is designed to clarify the bond that links quality assessment and effective teaching - and subsequently effective schools. Learning takes place one student at a time, and quality teaching, which includes assessment, is essential to reaching high stakes accountability goals.

"Evaluation"
comes from the Latin
meaning
"to value."

"Assessment"
comes from the Latin
meaning
"to sit beside."

Quality teaching, which includes quality classroom assessment, is essential to reaching the high-stakes accountability goals.

Policy Regarding Kindergarten, Grade 1 and Grade 2 Assessments

The State Board of Education requires that schools and school districts implement assessments at grades K, 1, and 2 that include **documented, on-going individualized assessments** throughout the year and a **summative evaluation** at the end of the year. These assessments monitor achievement goals and objectives in the North Carolina *Standard Course of Study*.

Assessments may take the form of these state-developed materials, adaptations of these materials, or unique assessments adopted by local school boards. Grades K, 1, and 2 assessments should be implemented by all schools by the 2000-2001 school year. The intended purposes of these assessments are:

- to provide information about the progress of each student for instructional adaptations and early interventions,
- to provide next-year teachers with information about the status of each of their incoming students,
- to inform parents about the status of their children relative to grade-level standards at the end of the year, and
- to provide the school and school district information about the achievement status and progress of groups of students (e.g. by school and grade level) in grades K, 1, and 2.

Currently the implementation of existing K-2 Assessments is inconsistent across the state. The majority of districts report using the state-developed K-2 Assessment materials in some way or at least in some schools. Not all districts are implementing K-2 Assessments nor are all schools within districts assessing students systematically at these grades.

As the state considers performance and promotion standards at grades 3, 5, 8, and 12, it is critical to ensure that systems are in place to monitor student performance along the way. Students who are not performing at expected standards need to be identified early and to have opportunities for early intervention and remediation to ensure successful learning. To that end, school and school districts need to monitor students' progress from their entry into school.

These state-developed assessment materials are aligned with the *North Carolina Standard Course of Study* and may be adopted or modified as appropriate for individual school districts. As you use them with students, add to and adapt the materials in order to make them useful for each school's unique situation. The North Carolina Department of Instruction appreciates any suggestions and feedback which will help improve upon this resource.

Classroom Assessment

No matter what the grade or the subject, teachers are responsible for finding out what their students know and understand and are able to do. Information about students' achievement, their thinking and understanding, and their skills and abilities to apply knowledge comes through assessment and is used to make numerous decisions related to students.

Assessment is both formative and summative. There are times when teachers want to evaluate their students' achievement because they are at the end of a unit or they are ready to mark student profiles or report cards. Other times they are preparing for conferences with the students or with parents. Sometimes they are making decisions about what to do next instructionally. Many times they are looking for evidence of understanding or misconceptions among individual students.

Assessment enables teachers to talk about the progress students make throughout the year. They are able to describe where students are performing in relation to content goals for the grade. Implemented well, classroom assessment supports quality instruction and improved student achievement. A lack of quality classroom assessment may result in instructional programs in which students do not reach their full potential.

What is classroom assessment?

Classroom assessment is an on-going process involving teachers and students in which

- learning targets (objectives) are clearly defined and students know what they are expected to learn,
- evidence of learning is gathered in a variety of ways over time,
- inferences and interpretations are made, and
- actions are taken based on conclusions drawn from the multiple sources of evidence.

Classroom assessment is not an add-on activity; many times it is indistinguishable from instruction. This is especially true if plans for lessons and plans for assessment are made together. Teachers know why they are assessing and modify the ways they will gather information according to their purposes.

Having a thorough, deep understanding of the content we are teaching is critical. Because the body of knowledge called mathematics is changing, we must be continuous learners to be good teachers of mathematics.

In North Carolina teachers are responsible for teaching the mathematics content specified by the *Standard Course of Study*. Organized into five strands, the

1. *Whom are we assessing?*

- *our students*

2. *What are we assessing?*

- *students' thinking and reasoning,*
- *their knowledge and the skills and processes they demonstrate,*
- *their dispositions, and*
- *their abilities to apply what they have learned*

3. *How are we assessing?*

- *in traditional and alternative ways such as observation and*
- *conversations along with samples of students' work*

4. *Why are we assessing?*

- *to plan our instruction better and*
- *to monitor students' progress*

5. *When do we assess?*

- *on-going, along with instruction as well as during specific, planned assessments (end of first, second, and third quarters as well as year-end)*

6. *Where do we assess?*

- *wherever we are interacting with and observing students*

content builds from one grade to the next. The content should be examined vertically as a continuum which follows strands from kindergarten through the eighth grade and horizontally by specific grade levels. Careful examination of the goals and objectives across grade levels shows the big ideas which constitute school mathematics.

While identifying the content, the *Standard Course of Study* does not specify how the goals and objectives are to be taught. Decisions related to specific activities, when objectives should be addressed, how objectives will be grouped for instruction, and the amount of time devoted to different objectives are the choice of the classroom teacher. Thus, teachers are able to factor in their knowledge of the students' interests and backgrounds as they make plans for instructional units throughout the year.

The overall goal is that **by the end of the year**, all students will have become proficient with the mathematics described for their grade level. Proficient means that they can model and explain the concepts, they can use the mathematics appropriately and accurately, and they are fluent and comfortable in applying mathematics.

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Some Tips for Classroom Assessment

- Are you assessing thinking and reasoning, not just memorizing?
- Review your learning targets with respect to the North Carolina Standard Course of Study. Decide what you need to assess. Is the information relevant to your instructional planning?
- Do you have this information about some students already? Will you need to assess everyone?
- Must this assessment result in a grade (evaluation) or is your purpose to make decisions about what to do next (or first)?
- What are the simplest and most straight forward ways to get and record the information you want? Do you need to make comments or will a checklist do?
- Are you planning to assess what is most important for students to know? Are you looking for evidence of learning in a variety of situations?

Methods for Gathering Information and Keeping Records

Because the classroom environment provides opportunities for teachers to interact with students in many different ways, multiple evidences of learning can be gathered related to what students know and can accomplish. Teachers are able to gain insight into their students' thinking and reasoning by asking good questions and listening as students explain why or how or what else. Insight into children's thinking helps teachers build on what students understand, not just what they can do by memorizing processes.

Observations and conversations are important assessment strategies at every grade. For primary students, however, observations and conversations (interviews) are likely to give the most helpful information for instructional planning. Young students frequently know more than they can record in traditional, symbolic formats. They arrive at answers, but find it difficult to write out the steps they used to arrive at a solution.

Since both correct answers and appropriate processes are valued in mathematics, teachers find that observing students and talking with them are ways to provide students with opportunities to demonstrate what they know and can apply in new situations. The emphasis on alternative assessments in the past few years has given support for using observation-based assessment, especially in more structured ways.

Because teaching styles and classroom organization vary from teacher to teacher, how observations are carried out will also vary. Some teachers choose to observe a few, specific students each day. By observing different students each day, they are able to focus in greater depth yet make notes on all members in the class within the week. Other teachers observe students in working groups, while some teachers observe the class as a whole. Noting what is typical as well as atypical in students' responses and actions is helpful in making good instructional decisions.

Supplementing information from observations with class discussions and conversations with individual students is one way to avoid bias or misinterpretations (i.e. what you expect versus what a child really thinks). Conversations with individuals or small groups, class discussions, or interviews with individuals all afford teachers opportunities to probe students' thinking. How students answer questions during instructional activities influences teachers' decisions during lessons. Students' responses give teachers immediate feedback as well as information for future use.

Ideas for making observations more useful include:

- *plan a systematic way to observe all students,*
- *identify specific behaviors and understandings to look for, and*
- *adopt an efficient way to record information.*

Effective questions are posed to give information about students' progress toward attaining the learning targets. More complex or difficult learning targets may require more time spent in asking questions.

- Tell me more about that.
- Can you show me?
- Why do you say that?
- Do you have a different idea or suggestion?
- What do you think about that student's answer?
- What else can you tell me?
- How do you know?
- Does that make sense to you?
- Is there another way?
- Why do you think that happened?
- Do you think this will happen every time?
- Can you retell that in your own words?
- Can you convince me?

Notice that these questions focus on students' thinking and reasoning, not just the right answer.

Notice that these questions focus on students' thinking and reasoning, not just the right answer. It helps to avoid questions that can be answered by a yes or no. It is also important to allow sufficient wait time for the students' responses. **Remember: When probing students' thinking, always ask the next question!**

Students' work provides a valuable source of information about what they understand. Drawings with captions, journals and learning logs, solutions to problems, and responses to open-ended questions are written records which help teachers decide what to do next. They also help teachers determine where students are in the process of moving toward the achievement of learning targets. These written records are helpful in conferencing with students and parents and with documenting progress over time. Parents, students, and teachers are able to see growth, the appropriate use of mathematical vocabulary, and the successful application of problem-solving strategies.

Importance of Documentation

An issue related to classroom assessment is record-keeping and documentation. As it becomes more popular to use multiple forms of assessment which do not always include written evidence, documentation becomes more of an issue. This is especially true for young students when observations and conversation are used for making important decisions such as giving grades or deciding placements.

While there are no quick and easy solutions to documenting evidence, there are many record-keeping strategies that teachers may use to record their observations, including involving older students in self-assessment and record-keeping. For example, the **Mathematics Observation Profiles** can be used by older students, parents, and teachers to monitor and record students' progress.

Teachers need to try several strategies and to develop their own system for recording, organizing, and summarizing the information they gather on their students. "Informed trial and error" may be the best description of the process.

Teachers who have been keeping anecdotal records for several years suggest ways to begin:

- Focus on a few students at a time.
- Focus on a few learning targets at a time.
- Keep comments clear, precise, and related to student's demonstrated understanding. Write down only what you see!
- Date your observations.
- Don't be too quick to give up on a method, but don't stick with it if you find it doesn't work!
- Make quick notes (such as marks on a checklist) during circle or calendar time. as students are sharing their problem-solving strategies, or when students review their work with you.
- Be quick to make notes of unexpected information, but be slow to decide that students are proficient with new content.

Look for evidence in a variety of situations.

- Find a method that fits you so that you do not have to recopy notes.
- Find a colleague with whom to collaborate.
- Gain the principal's support by sharing your assessment strategies and record-keeping approaches.



Interpreting Data and Making Inferences

Walk into many primary classrooms today and you will find students using a variety of materials and manipulatives that enable them to explore concepts and develop new understandings. Regardless of age, students need opportunities to explore and construct knowledge using things that can be touched, moved, and manipulated. These *hands-on* experiences help students make visual images that they can call upon at a later time to solve problems, make decisions, and connect with other information.

Students need to be challenged to come to the understanding of new skills and concepts through their own investigations and actions while at the same time be required to explain their thinking. Learning rules (algorithms) may enable students to be successful at a task in the short term but overall may prevent the students from the development of meaningful skill expertise and deep understandings that support the ability to transfer the learning into other applications.

Giving meaning to students' words and actions is not a simple task, but it is critical that the interpretations are as accurate as possible. Because decisions about students and teaching arise from the interpretations, teachers must think carefully about the mathematics they are teaching, the continuum of understandings and skills related to the learning targets, and the information they have learned from the assessment.

Assigning meaning to students words, actions, and products is perhaps the most difficult part of assessment. However, teachers must deal with students' misconceptions as well as their strengths if students are going to be successful. If decisions are made from too little evidence or misleading evidence, teachers may not plan the necessary classroom experiences for the students to refine their thinking.

Some mistakes that children make come from a lack of information. At other times mistakes reflect a lack of understanding. Knowing when to give information and when to allow students time to correct their own misconceptions is part of the art of reflective teaching.

Valid inferences require informed judgment on the part of teachers. Knowledge of mathematics, what is relevant to the learning target, the quality of the assessment data, and the individual students are components of valid inferences. Feedback for students and focused instruction can grow out of valid inferences.

How much evidence is needed? One way to answer this question is to consider the consequences of the inferences. Judgments made that influence the lesson for tomorrow need less evidence than judgments that go home on report cards or that influence whether or not a student goes into a special program. Breadth and depth of evidence should always be determined by what decisions are

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being made and the opportunities students will have, or will not have, to re-engage with the learning targets.

Using Assessment Data Wisely

Using assessment data wisely means that a variety of actions flow from the gathering of evidence related to students' learning and subsequently interpreting those data. The actions involve identifying where students are in relation to the achievement that is being targeted and making decisions about what to do next.

The actions that teachers take may be grouped into four categories:

- Informing instructional plans,
- Giving feedback to students,
- Communicating with parents, and
- Assigning value (grades and promotion) when appropriate.

Making Instructional Decisions

The nature of classroom assessment means that not all decisions are large ones. Each day teachers observe students, interpret what they see, and make decisions about instruction. One decision that is frequently made is to “wait and see.” Knowing when to intervene to give students more information and when to hold back is difficult. *The danger of too much intervention is that students will parrot teachers' actions without an understanding of the mathematical ideas (concepts) that underlie the action.* This creates “illusions of learning” that allow success in the short term but result in students' not having a foundation upon which to build.

Equally troubling, however, is inaction. There are times when teachers need to intervene. Repeated drill in which students “practice doing it wrong” can be avoided when teachers take seriously their role in making appropriate inferences from assessment data and then making informed decisions about what happens next.

Giving Feedback to Students

Feedback can be both formal and informal. It can be oral or written, given to the class as a whole or to individual students. Often it is in the form of questions that encourage students to think through what they are doing so that they recognize the inconsistencies or mistakes.

If a school goal is to create life-long learners, students from the earliest grades

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need to be given encouragement and confidence in themselves as learners. They need to have their ideas respected and be given opportunities to make sense of the mathematics they are learning. Feedback communicates interest and a respect that values students' thoughts even as teachers challenge students to explore further.

Giving Feedback Through Conferences

Teachers have a number of professional responsibilities which involve evaluating students' progress and sharing that information. They share through report cards, letters to parents, and forms in cumulative folders. Interactive conferences with students and with parents are among the most powerful ways that students' achievement is summarized and shared and new goals are set.

Conferencing with students occurs in a variety of ways. Many conferences are informal, spur-of-the-moment conversations with students that focus on a particular issue, task, or problem. These are important because the student is receiving important, immediate feedback as the teacher is gaining insight into the students' thinking.

More and more teachers are scheduling formal conferences with students to discuss mathematics. These conferences include evaluating current work, reviewing problem-solving activities, and setting goals.

Conferences with parents often occur through phone calls, notes, or informal meetings in the grocery store. Formal conferences, however, benefit families and teachers because they celebrate successes, clarify expectations, and form partnerships for future learning. Parents are able to ask questions as well as share their personal goals for their children. To inform families fully about a students' progress, teachers (and students) assemble and review collections of evidence. Teachers synthesize what they know about the strengths or gaps in students' conceptual knowledge and evaluate students' progress toward the learning targets.

The Grading Dilemma

There are issues surrounding grades that do not disappear when teachers expand their use of classroom assessment. They do find, however, that they have greater knowledge about the students upon which to base their judgments. Better evidence that comes from a variety of sources and has been gathered over time means that teachers are able to make explicit statements about students' progress toward the learning targets.

Many report cards do not use single numbers or letters but are narratives. Others combine all information about a student into a single number. In these situations, many issues remain. *Are the grades reflective of judgment against a standard or are they comparisons to other students? Are they "averages"*

Learning targets from the NC Standard Course of Study define what students should know and be able to do.

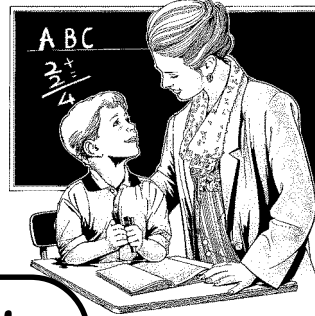
or do they reflect where the student is performing at this point in time? Are all grades weighed equally? Do the grades reflect achievement or progress? Is effort included in the content grade?

The list could go on and on. Grading practices reflect local policies and vary from school system to school system. What is consistent across school systems is that grades send powerful messages and influence how students feel about themselves as learners. For this reason (as well as others) summative evaluations of all types must be based on the best, broadest, most valid information possible.

Summative assessments, which include those that come at the end of grading periods or at the end of the year or in times of decision-making about students' placements, should be a synthesis of all that is known about the students' learning in relation to the long-term goals of a grading period or the school year. On-going classroom assessment informs these summations.

The remainder of this resource is devoted to providing specific performance tasks and items to help teachers assess their students. These materials are in no way intended to replace the on-going quality assessment which is part of quality teaching.

Teachers share some Record-Keeping Ideas



Notes written directly on work samples or worksheets

Checklists, Labels, and Electronic Records

- * class or group roster on the left and skills, information, concepts or processes to be assessed across the top
- * skills clustered as taught or listed for a grading period
- * labels -printed with student names added to individual folders or portfolios

Student Reflections

- * student journals
- * explanations of strategies
- * responses to open-ended questions
- * worksheets and drafts with student's annotations and corrections

Profiles

- * summaries and synthesis of work over time
- * use anecdotal notes, observations, interviews, student products to evaluate student work
- * highlight or mark objectives to summarize performance at the end of a grading period
- * summarize the results of on-going assessments

Note Cards and Plan Book

- * cards kept on a clipboard or in a file
- * cards kept on students working in a group or on a specific project
- * note cards completed on a rotating schedule
- * note cards completed as needed - usually for students having special difficulty
- * notes written during finish-up times
- * notations in plan book about lessons or specific students
- * notes in plan book about future groupings for help with specific skills

Skills/Topic		Date / /	
Bill	Sue	Mark	Juanita
Linda	Karl	Lee	
Dot	Jo	Will	
Van	Tate	Luis	

Calendar or Grid

- * one cell per objective or cluster of objectives
- * a grid for each week and every student listed - use to make notes or record observations for on-going assessments

Water Fountain Assessment

The school day is full of opportunities for learning more about students. In one sense, assessment is simply “gathering information in order to make decisions.” Any assessment method collects a *sample* of student performance. It is possible to accomplish this simply and quickly while carrying out regular classroom routines such as lining up for lunch, going to the water fountain, waiting in the lunch line or the second bus to arrive, and browsing in the school library.

Here are a few examples of the kinds of tasks that lend themselves well to this approach:

Kindergarten

Rote count to 30 or beyond
Rote count backward from 10
Use ordinals first through tenth
Estimate quantities less than 20
Model and use directional and positional words
Use non-standard measurement of length, weight, capacity, and time
Name the days of the week
Sort by given attribute
Identify, copy, continue, and describe patterns; create patterns with actions and words.

First Grade

Count using one-to-one correspondence to 99
Rote count by 1’s, 5’s, and 10’s to 100 and by 2’s to 20
Read numerals to 100
Read number words zero to ten
Identify one more/less, before/after/between
Memorize addition and subtraction facts to 10
Estimate quantities up to 30
Recognize, identify and describe plane geometric figures: circle, square, triangle, rectangle
Recognize plane geometric figures: hexagon, trapezoid, parallelogram
Recognize three-dimensional shapes: sphere, cube, cylinder, and cone
Use directional and positional words
Use non-standard units to estimate and measure length, weight, and capacity
Use calendar language appropriately, seasons, months, today, yesterday, tomorrow, next week, last month
Tell time to the nearest hour and half-hour
Copy and continue patterns, with actions and words and translate into other forms
Identify patterns in the environment.

Second Grade

Rote count to 1000

Read word names for numbers to 999

Use counting strategies such as skip-counting by 2's, 5's, and 10's

Make reasonable estimates up to 100

Memorize addition/subtraction facts up to 18

Identify and use 10 more and 10 less

Indicate the value of each digit in any 2- or 3-digit number

Sequence months

Tell time to the nearest five minutes

Determine the value of sets of coins

Identify classification and patterning in the environment

Use patterns to continue numerical sequences

Identify and correct errors in numerical and geometric patterns

Define and continue pattern units

Here are a few specific suggestions for how to go about conducting “Water Fountain Assessment.”

- While students are standing in line, hold some coins and ask a student how much money you have. Ask this student what other coins would make the same amount of money.

- While students are browsing in the school library, ask a student to count by 2's or some other number and tell you how many books are on a specific shelf or table. Then ask whether this is an odd or even number.

- Ask students to give you the “password” as they pass through the doorway of the classroom. The password is the answer to an addition or subtraction fact that you whisper to a student when he or she reaches the doorway. Or the password could be the answer to a question like “How many hundreds are there in 532?” or “What time is it?”

- Have a student ask the rest of the class to line up by attributes. For example, a student might say, “Everyone wearing red and shoes that tie, line up. Now, everyone not wearing red but have shoes that tie, line up. Last, everyone not wearing red and shoes that don't tie line up.”

- Ask a student to predict how many “baby steps” it will take to get from the classroom to the water fountain. Then have that student measure the distance in baby steps as he or she walks to the fountain.

- Ask a student to find as many rectangles as possible and point them out as the class walks from the classroom to the lunchroom.

- Ask a student to rote count or recite the days of the week.

- Ask a student, “Who is fifth in line?” If the student answers correctly, ask him or her to move to the tenth place in line or to stand between the third and fourth persons in line.

This assessment strategy is especially helpful for gathering more information about those students you are not sure about. Perhaps you have a student who you think might be ready for greater challenges. Use Water Fountain Assessment to help you gather the information you need in order to decide how to challenge this student. For example, you think Tiffany can easily determine the value of sets of coins less than \$1. You wonder whether she is ready to move to values greater than \$1. Show her different sets of coins from your pocket while standing in the lunch line. Gradually increase the value of the coins. If she confirms your inference that she's ready to move on, you can plan accordingly.

Perhaps you have a student who is still struggling with determining the value of sets of coins. The next day while standing in the lunch line, you pull out your coins for this student. You might discover that this student knows more than you expected and doesn't need any special help or reteaching. Or, you may discover that this student is really struggling with determining the value of sets of coins and needs special attention. This is a good time to find out how many coins or for which coins the student can determine the value in order to know what to build upon. You don't necessarily need to do this same assessment with everyone in class. Use this strategy with students for whom you want to verify your inferences or gather additional information.

Keep in mind that one purpose for assessing student understanding is for planning instruction. Take advantage of every opportunity to learn more about your students.

