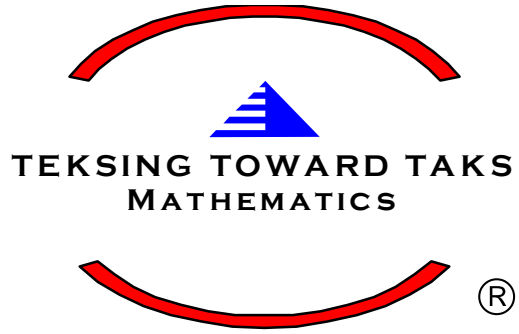
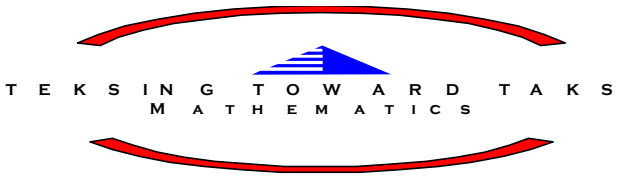


TEKS/TAKS BASED MATHEMATICS CURRICULUM

OVERVIEW

Grades 5-8

Brenda DeBorde **brenda_deborde@msn.com**
Juanita Thompson **JThom3250@sbcglobal.net**



Overview of TEKSING Toward TAKS
Grades 5-8 Curriculum Components

DATA GATHERING AND ANALYSIS

Recording and analysis of data is a critical component of the TEKSING Toward TAKS curriculum. Recording in a Class Profile book by the teacher should occur on an almost daily basis. Expectation is that all Mini-Assessments, Six Weeks Assessments, and Benchmark Assessments will be recorded in a profile booklet for each class. Teachers may choose to record any additional assessment data. Analysis of the data will guide and direct instructional decisions in Six Weeks #4 and Six Weeks #5 for lessons that will be designed by each teacher for each class.

Recording in a Student Profile book by each individual student should occur on a regular basis. Expectation is that Mini-Assessments, Six Weeks Assessments, and Benchmark Assessments will be recorded by each student. Analysis of this individual student data should be utilized to make decisions regarding reteach and tutorlals for each student. Students should only be given additional work on TEKS or major portions of TEKS that indicate a weakness. Students should not be expected to complete additional work on TEKS that indicate strength.

SCOPE AND SEQUENCE

Each six weeks curriculum begins with a Scope and Sequence. The Scope and Sequence provides information about each TEKSING Toward TAKS lesson, as well as other resources available to teachers as enhancement to lessons or as additional resources for teacher design of lessons in Six Weeks #4 and Six Weeks #5 as indicated by data in the Class Profile books.

Also included on the Scope and Sequence is a listing of the Spiraled Practice which should be completed by students at the beginning of 25 class periods each six weeks. The Spiraled Practice is a set of 3 spiraled questions to assess student understanding of TEKS assessed on TAKS. Every question in this document is correlated to a specific TEKS. Students may be presented with problems on TEKS that have not been a focus for an instructional lesson. This process will help students retain mastery of TEKS as well as introduce TEKS prior to instruction.

The process for completing a Spiraled Practice is:

- Provide each student with a copy of the Spiraled Practice when they enter class. Students may work with a partner pair to complete the questions from August through January. Each student must show work on an individual page(s). In February students are expected to complete each Spiraled Practice individually and without assistance.
- Hand 3 different partner pairs a blank transparency and transparency pen. One transparency is marked with #1, another with #2, and the last with #3. This indicates to the students which problem they are being assigned for debriefing. The partner pairs work the assigned problem on their transparency first, then the other problems on their Spiraled Practice sheet.
- Allow students to work on the Spiraled Practice for only 6 minutes after the bell has rung. Students should identify the “main idea” and “supporting details” for each problem, choose a strategy for solving the problem, then solve the problem. Call time. The partner pairs with transparencies #1, #2, and #3 immediately proceed to the overhead projector. Each partner pair has 1 minute to discuss “main idea”, “supporting details”, and the solution to the problem.
- Students who did not complete the Spiraled Practice in time allowed may add written information to their paper in a different color.

SCORESHEET

A scoresheet is provided for each six weeks and includes space to score each Student Activity, Open Ended activity, Homework activity and Mini-Assessment. The scoresheet is designed so that a teacher may combine scores to record in a gradebook when appropriate and keep a record of lesson components that are not completed as a class so they may be utilized at a later time when extra instructional time is available.

SIX WEEKS ASSESSMENT

The Six Weeks Assessment is designed to assess all TEKS in lessons from the entire six weeks. The assessment includes 20 questions. Each question should be given 5 points for a correct answer. Partial credit may be given if a student's work exhibits partial understanding, or if the student makes a minor mathematical mistake. Only two points credit should be given for a correct answer if student work is not shown on the assessment.

The teacher should record this assessment data in the Class Profile and students should record data in individual Student Profile books.

LESSON COMPONENTS

Math Background

The background information includes the lesson objective(s) and teacher preparations to be completed prior to beginning the lesson. Also included is mathematics background focused on the level of expectations for grade 6 students for the lesson.

Instructional Activity(ies)

Each Instructional Activity is specific to a TEKS or major piece of a TEKS. The Instructional Activities in each lesson provide a format for duplication as a transparency or for projection for whole class instruction. The teacher should place each transparency on the overhead projector and lead an informational session designed to provide students with mathematics skills and vocabulary necessary for students to complete the Student Activity(ies) and Open-Ended activity(ies).

Prior to placing the transparency on the overhead, students should be provided with a Grade level Math Notes page(s) so each student records the critical information from the Instructional Activity on their individual Math Notes page(s). Student record as much information as they choose. The information should be recorded in the student's own "words," "symbols," and pictures or diagrams.

Only minor discussion should occur during the Instructional Activity. This portion of the lesson is designed as an information-giving time. Students should be asked to hold most questions until the Student Activity portion of the lesson so that the teacher can meet needs on a partner-pair basis.

The teacher should leave the Instructional Activity transparencies in a place where students can view them later if they need to take additional notes.

Student Activity(ies)

The Student Activity(ies) follows the Instructional Activity. Students work in pairs to complete a Student Activity, however, each student completes their own activity page(s). Math Notes are utilized to enable students to successfully complete the activity. If students did not take notes on material they need to complete the activity, the teacher should invite them to view the Instructional Activity and to take more detailed notes.

Various partner pairs should be assigned portions of the Student Activity for whole-class discussion. Before students begin the activity, the teacher should inform the class of the time allotted for completion of the activity. Time should be called even if all partner pairs have not completed the activity. Whole class discussion should begin with the partner pairs that had assignments leading the discussion. Partner pairs who did not complete the activity may complete the activity at this time by recording in a different color pencil or pen.

The Student Activity is **not** designed to be recorded as a grade, but should be recorded as a holistic score. A scale of 1-4 is appropriate as follows:

- 1 = no understanding evident
- 2 = minimal understanding evident
- 3 = mostly understood or slight mathematical errors
- 4 = complete understanding evident and no mathematical errors

Instructional Activity/Student Activity

A variation of an Instructional Activity is included in most lessons. The Instructional Activity includes teacher information regarding preparation for the activity, as well as questions to pose before and during the activity, and student responses to look for and listen for during the activity. The Student Activity tied to this Instructional Activity is designed as an active, involved, hands-on activity for all students.

Open-Ended
The Open-Ended activities are the next component of each lesson. The teacher is provided with a transparency master of the problem and the students are provided with a student page to complete while working with a partner. Each student must complete an individual Open-Ended student page. Students may utilize Math Notes and Student Activity pages while completing the Open-Ended problem.

The teacher sets a time limit prior to students' beginning the Open-Ended. Partner pairs are given specific "share" portions of the Open-Ended. The process that should be followed by all partner pairs is to complete the questions at the bottom of the page first (except for the **Extension)**, then complete the solution(s) to the problem(s) at the top of the page, then complete the **Extension** at the bottom of the page. (NOTE: the **Extension** is designed to spiral into the same TEKS or to spiral into a closely related TEKS.)

The teacher calls time and the partner pairs guide class discussion on their "share" assignments. Students who did not complete the Open-Ended prior to the time limit may record on their individual papers during the discussion time but must record in a different color.

The Open-Ended is designed to be recorded as a portion of a grade. A holistic score should be recorded for each student. A scale of 1-4 is appropriate as follows:

- 1 = no understanding evident
- 2 = minimal understanding evident
- 3 = mostly understood or slight mathematical errors
- 4 = complete understanding evident and no mathematical errors

Scores should be recorded and periodically combined and recorded as a grade. A more detailed holistic scoring device is provided on a following page.

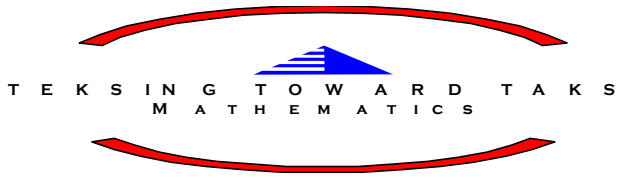
Mini-Assessment
The Mini-Assessment follows the Open-Ended activity. The mini-assessment should be completed and graded for each individual student. No assistance should be given during this time. Allow approximately 10 minutes for completion of the Mini-Assessment. The amount of time may vary for some assessments.

The teacher should score each Mini-Assessment and a score of 1-5 should be recorded for each student. Partial credit may be given for each question if the student shows evidence of understanding but did not choose the correct answer due to minor mathematical error. Only ½ credit should be given for a correct answer if student work is not shown on the assessment. Scores should be periodically combined and recorded as a grade.

The teacher should record class data for this assessment in the Class Profile book. Students should record individual data in their Student Profile book.

Homework
Homework is provided for each lesson. If a lesson is more than one instructional day in duration, more than one Homework is provided.

Each homework assignment includes 5 open-ended questions. Each teacher should choose two or three questions to be scored by the teacher. The teacher should make written feedback comments for each student and should return the homework assignments within two class periods. Partial credit should be given if a student's work exhibits partial understanding, or if the student makes a minor mathematical mistake. Only ½ credit should be given for a correct answer if student work is not shown on the assessment. The score on the two scored questions should be recorded for each student. Periodically these scores should be combined and recorded as a grade.



Implementation of TEKSING Toward TAKS Grades 5-8 Curriculums

Implementing these curriculums requires a new way of teaching. The traditional teacher roles of authority figure and information disseminator must change to learning facilitator and instructional decision maker.

Knowledge about students and how they learn mathematics can contribute to establishing a conducive learning environment for middle school students. The lessons in this curriculum are designed to meet the requirements of the Texas Essential Knowledge and Skills for grade 6 mathematics. The design of each lesson is consistent and includes a format for delivery of instruction, assessment, and homework. Where appropriate, the use of manipulatives and technology is included in the lesson. Cooperative learning as a learning setting is utilized in each lesson.

Appropriate use of manipulatives

Manipulatives are multisensory tools for learning that provide students with a means of communicating ideas by allowing them to model or represent their ideas concretely. Using manipulatives, however, does not guarantee that understanding of a mathematics concept (Baroody 1989). After allowing students to explore using manipulatives, teachers must formulate questions to elicit the important mathematical ideas that enable students to make connections between the mathematics and the manipulatives used to represent the concepts. The authors of the TEKSING Toward TAKS curriculum assume that teachers will choose to use manipulatives when appropriate for instruction in their classroom.

Appropriate use of technology

Developments in technology have made the traditional, computation-dominated mathematics curriculum obsolete. As a result, the authors of this curriculum assume that middle school students will have access to appropriate graphing calculators. Also assumed is the use of computers with dynamic geometry software should be available for instruction focusing on geometric concepts for demonstration purposes as well as cooperative group work or individual work.

Appropriate use of cooperative learning groups

Traditionally, mathematics has been taught as a “solo,” isolated activity, yet in business and industry mathematicians often work in teams to solve problems and attain common objectives (Steen, 1989). Allowing students to work in partner pairs of cooperative groups affords them the opportunity to develop social and communication skills while working with peers.

Cooperative learning environments, characterized by students working together and interacting with each other, contribute to internalizing concepts by forcing the students to defend their views against challenges brought by their peers. The value of this approach is supported by the work of Vygotsky [(1934)(1986)] who discussed the increasingly interrelated nature of language and cognition as children grow.

Cooperative learning groups are heterogeneous and everyone must work together for the common good of all. Students who understand the concept being discussed are responsible for explaining it to those who do not understand. When using learning pairs or cooperative groups, teachers must consider new ways of evaluating performance to ensure the success of instructional objectives.

The role of assessment

Making changes in the content and methods of mathematics instruction will also require making changes in why and how students' work is assessed. Evaluation should be an integral part of instruction and not be limited to grading and testing. There are at least four reasons for collecting evaluation information:

- to make decisions about the content and methods of mathematics instruction
- to make decisions about classroom climate
- to help in communicating what is important
- to assign grades.

In other words, assessment includes much more than marking right and wrong answers. It "must be more than testing; it must be a continuous, dynamic, and often informal process" (NCTM 1989, p. 203). The *Curriculum and Evaluation Standards* recommends that teachers use a variety of types of evaluation: (1) *observing and questioning students* (2) *using assessment data reported by students*; (3) *assessing students' written mathematics work*; and (4) *using multiple-choice or short-answer items.* Use of these multiple methods of collecting assessment data will contribute to a thorough evaluation of students' work.

Principles and Standards for School Mathematics (National Council of Teachers of Mathematics, 2000) states: "Assessment should support the learning of important mathematics and furnish useful information to both teachers and students." NCTM (1995) identified the following six standards to guide classroom assessment:

Standard 1: Assessment should reflect the mathematics that all students need to know and be able to do.
Standard 2: Assessment should enhance mathematics learning.
Standard 3: Assessment should promote equity.
Standard 4: Assessment should be an open process.
Standard 5: Assessment should promote valid inferences about mathematics learning.
Standard 6: Assessment should be a coherent process.

Implementing the assessment process in the TEKSING Toward TAKS Middle School Curriculum may require significant changes in how teachers view and use assessment in the mathematics classroom. Teachers will assess frequently to monitor individual performance and guide instruction.

The intent of the TEKSING Toward TAKS curriculum is to provide middle school teachers with a structure for instruction in the TEKS that incorporates characteristics of a good mathematics learning environment and the role of assessment as a starting point for student mastery of the TEKS as well as improvement on student achievement data as assessed on the TAKS.