



Guide to the Intermediate Assessment in Technology

THE STATE EDUCATION DEPARTMENT
THE UNIVERSITY OF THE STATE OF NEW YORK
ALBANY, NY 12234



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Assistant Commissioner for Curriculum, Instruction and Assessment

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Dear Colleagues:

This **Guide to the Intermediate Assessment in Technology** is the first step in helping school districts identify essential knowledge every student should know about technology through technology education classes. As an integrating discipline, technology education can help reinforce concepts in all subjects, ensuring student understanding in a real world context. The assessment in technology will help districts identify areas of strength and weakness in programs as it relates to the Learning Standards at the intermediate level. This first step will lead to providing students with a uniform level of instruction and a foundation for further study in technology. Additionally, a survey form is enclosed to identify professional development opportunities for teachers. We encourage you to submit the survey to aid in this process.

The sample questions contained in this guide can be used by classroom teachers to reflect on their instruction and provide students and teachers with examples of the format and question types that can be expected on the actual assessment when it is first administered in the Spring of 2001.

The State Education Department is interested in receiving feedback on these materials. A comment sheet is included so that you may forward your responses to us. The comment sheet and the professional development survey may be faxed to (518) 473-0858 or mailed to the address listed below:

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Thank you for your assistance with this significant endeavor.

Sincerely,

Roseanne DeFabio

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Introduction

Rationale

School districts need to have a way to determine student levels of performance in mathematics, science, and technology education as outlined by the intermediate level Math, Science, Technology Learning Standards. Since the development of the syllabus, **Introduction to Technology Grade 7 & 8**, accountability for programs in this mandated one unit of study has been lacking. Technology education at this level provides a foundation of knowledge for further study in technology and develops transferable skills valued in other subject areas. Determining effectiveness of instruction and programming will help to identify student achievement of the standard and support success at the commencement level. The middle school program begins to define aspects of technology where students need to make decisions about technology that affect their lives and learn to solve problems related to technology. The Regents have recognized the importance of technological literacy and reaffirmed the middle school mandate that every student should have one unit of technology education by the end of the eighth grade.

Introduction to Technology Grades 7 & 8 is a course of study that was ahead of its time when it was introduced in 1986. Still relevant, the course aims to guide students through a progression of modules that will help them define technology in their lives, develop problem solving abilities and make connections with other disciplines in support of knowledge acquisition. Schools that have been using **Introduction to Technology Grades 7 & 8**, as it was intended will have kept current by updating their activities to mirror current technological advancements and be able to make connections to the standards and the performance being expected of students in this area at the intermediate level.

A comprehensive middle school technology assessment as envisioned would consist of two components: a section assessing technological content and a section assessing integrated MST capability. This paper and pencil assessment in the initial years of its administration will look at assessing the technological content of a program. As a program evaluation, student's responses to questions posed will reflect the aspects of the syllabus and standard that are present.

The MST capability component is still under development and is **not** included in this assessment. It is intended to assess process and performance aspects of the MST learning standards. When this component is validated it will be incorporated into the assessment.

Purpose

This assessment will help districts identify specific areas of the middle school technology education program that may need updating or modification to help students achieve the intermediate level of the standards. With program modification comes changes in instructional approach. When specific areas of a program are in need of modification, professional development opportunities can be identified. As programs show consistency around the state focus can be shifted towards identifying strategies for improving individual student achievement. In this way a uniform foundation of basic knowledge is provided to students and teachers are provided with the instructional tools needed to do their job.

Notes to Persons Responsible for Implementing the Assessment

Superintendents, Principals, Coordinators of Programs

Understanding technology has become an imperative in today's society. Technology education can play an important role in providing every student with essential knowledge and skills needed to function as responsible citizens. The integrative nature of technology education provides a context for students making connections in the real world.

This assessment is intended to measure program effectiveness based on the content standard for technology (MST Learning Standard 5). The recommended delivery system for this standard are technology education classes. Districts that rely heavily on computers for content delivery or offer students less than the one unit of instruction in this course of study may see assessment results that are less than satisfactory. These factors should be taken into account when assessment data is reviewed. Professional development plans should provide opportunities for technology education teachers to gain experience in new forms of assessment and instructional approaches. The unique nature of technology education instruction lends itself to supporting many academic subjects by developing transferable skills such as critical thinking and problem solving.

"Technology education classes are often distinguished by their student-centeredness: students typically involved in design and research, working on their own but facilitated by able teachers."

NYS Landscape Study, Inverness Research Associates
April 1999 page 10

Teachers

This assessment's purpose is to improve student performance through exemplary programming. Assessment data should be viewed as a tool for program improvement in a constantly changing world. Currently teaching can be a facilitator role providing the best opportunities for all students equally in the class. The Board of Regents indicated in a policy statement that successful middle school teachers, "Use a variety of teaching strategies to match instruction to the varied learning styles of individual students."¹ This yearly assessment is but a snapshot of a program. Multiple year data will be needed to establish a clearer picture. It is hoped that by that time programs will have made needed adjustments resulting in higher levels of student achievement.

Students should understand that assessments will become not just a semester or term ending activity. Teachers should emphasize that this assessment be taken seriously by students. As more authentic assessment methods are used on a daily basis, students will see them as ways of demonstrating what they know and understand.

¹ Regents Policy Statement on Middle-Level Education, March, 1989 page 257

Assessment Strategies

Because the assessment is designed to help districts identify the strengths and weaknesses of their overall program, individual scores will reflect student understanding of what may or may not have been covered in this unit of study. Many concepts covered in math and science at the intermediate level are essential to student success with this assessment. Because of the flexibility districts have in delivery of the unit of study and the related math and science concepts, the assessment is designed to be given towards the end of grade eight so that students can demonstrate their understanding of this knowledge as well.

This assessment should not be considered a final assessment of students or programs. Assessment is a continuous process that provides feedback for improvement at all levels. As schools implement standards and focus on what students need to know, assessment also needs to reflect the needs of students, parents, teachers and administrators. In the event a teacher wishes to use the raw data from the assessment to evaluate student levels of achievement, a scoring matrix would be included to help translate the individual score. It is recommended that this score not be part of a student's final grade. In no circumstance should this score be a deciding factor in whether a student passes or fails the course.

The sample assessment questions contained in this document can be used by classroom teachers to gauge the level of their student's understanding of the technology concept instruction is providing. At the same time, teachers can use the test to reflect on their own instructional approaches to the subject matter. If weaknesses are shown in particular areas of the standard, activities can be modified or changed to better focus the content. Administrators can use the data to gauge how consistent their program may be across the district. This uniformity provides valuable assurances to high school programs that students are coming to them with a foundation of knowledge for further study in technology areas and other general education subjects. The sampler questions should also be viewed as an opportunity for students and teachers to try more authentic methods of assessment in their daily instruction. Extended response questions allow students a chance to more fully explain their answers to questions and reveal a more detailed understanding of the concepts being discussed. An excellent article on standards based assessment can be found at: www.mcrel.org/resources/noteworthy/assessment-system.asp

Using the Sample Assessment in the Classroom

Besides providing teachers with feedback about their program, one of the purposes of the sampler is to help the student become familiar with the assessment format so they will know what types of questions to expect and how much time may be needed to complete them. The sample questions are also designed to help each student understand where their knowledge level is in relation to the seven key ideas in the technology standard.

All teachers are encouraged to review the sample assessment questions with their students after it has been given and scored so the students can learn from the experience. Also a discussion with your students about rubrics and how they are designed to give partial credit will help them the next time they encounter extended response questions. It is further hoped that all teachers will provide additional instruction or activities for students in areas of weakness discovered through answering the sample questions.

Although the sample questions can be used as a one period assessment, it is suggested that teachers develop their own assessment items to supplement these questions. Because the sample questions represent approximately one half of an actual assessment, teachers should develop their own version to give students a feel for a more complete experience. The blueprint for the assessment should guide the development of teacher-generated questions. This exercise also provides teachers with a valuable staff development activity in the construction of relevant assessment items and rubrics that are standards focused. Assessment of performance indicators expected of students at this level is vital to determining student achievement and keeping courses relevant. Locally developed assessments should probe student understanding of technology and provide the teacher with information to aid instruction. Various assessment forms should be explored that are supported by current research. Performance assessment is essential for specific skills being developed and should be utilized locally when ever practical.

Instructions for Administering the Sample Assessment

The sample questions are positioned in this document to make it easy to duplicate. Feel free to duplicate and use as appropriate. Students should be instructed to provide the best answer or explanation for the questions as possible, based on their current knowledge of math, science and technology. The questions are not arranged in topical order and students should answer them based on information given for each individual question **unless** special instructions indicate otherwise. The extended response questions have sufficient space for students to show their work or provide a written response. Make it clear that written responses should be clearly written and readable. For ease of scoring, you may want the student to write their answers on a separate sheet of paper.

Scoring of the practice assessment by the students can be a powerful tool for learning and sharing ideas. As a teacher you will receive more immediate feedback as to what the students have learned and how to proceed with instruction. When the actual assessment is administered, teachers will be scoring the student work locally. Data collection sheets and scoring guides

provided with the actual assessment will use the most efficient method of collecting data to be submitted to the State.

About the Questions

The questions in the sampler are representative of the type and form to be assembled for the actual assessment. Classroom teachers have put each question in the sample and in the actual assessment through a rigorous development process that has resulted in valid and reliable measures of the topics they address. The questions are arranged in order of difficulty, easier to harder, based on statistics generated through pre-testing.

Various charts in this document illustrate the connections between content areas in math, science, technology and the syllabus. They are intended to help teachers identify parts of their program that may be missing or under emphasized. Because of the flexibility that is built in to the course, it is important for teachers to identify activities that support the content. The questions are tied to the key ideas in the standard and are supported through the module performance goals in the syllabus. The blueprint for the assessment reflects the perceived emphasis that currently exists in the field while the questions were developed by practicing technology education teachers. As programs move closer to alignment with the standards, the blueprint percentages will change on future assessments to reflect a more even distribution.

Sample Question Distribution by Technology Key Ideas and Assessment Blueprint

Engineering Design	1., 8., 12., 14.
Tools, Resources and Technological Processes	3., 5., 6., 17.
Computer Technology	7., 11., 15.
Technological Systems	9., 10., 16.
History, Evolution of Technology	2., 4.
Impacts of Technology	18.
Management of Technology	13.

The number of questions included in the sampler is approximately one-half of that which will be on the actual assessment. Because this is a newly developed assessment, the bank of available questions is small and is continuing to be built, necessitating an abbreviated set of questions for this guide. Teachers are encouraged to develop their own questions to fill out the practice assessment for a more complete experience for the student.

Local scoring of the Sample Questions

As was mentioned earlier, scoring of student work in class has added value for both the teacher and students. Teachers see clearly what students know, and students learn from seeing other viewpoints on the extended response questions. Much work has gone into the rubric development of the sample questions and the extended response questions developed for this assessment. Rubrics that are too subjective or do not allow for sufficient partial credit are not effective or valid measures of student knowledge. Rubrics that are specific to the elements of the

question asked and allow sufficient credit to be given in all situations are valid indicators of student knowledge and understanding.

If the teacher chooses to score the sample questions themselves, the answers for the multiple-choice questions are included. Careful review of the examples of student work and points given for the extended response questions should be reviewed prior to scoring to get a feel for an appropriate response. Do not be surprised at how your students respond to these types of questions. Although it may be tempting to stray from the rubric when scoring, efforts made to score according to the point structure and criteria will produce a more accurate picture of what your students know about the topic.

Scoring Guide for the Assessment Sample Questions

Note:

The questions that follow have been selected from the item bank of questions being developed for the actual assessment. These questions are based on the examination blueprint and are representative of the type that will be on the actual assessment. This sample represents approximately **one half of an actual assessment**. Teachers should construct an equal number of additional questions if they want their students to have a full assessment experience.

Answer Key

The answers to multiple choice questions 1- 14 are listed below. Extended response questions 15-18 have individual scoring rubrics. The rubrics are listed after questions 15-18.

1. 1
2. 3
3. 1
4. 2
5. 3
6. 3
7. 4
8. 1
9. 4
10. 3
11. 3
12. 4
13. 3
14. 2

The pages following the questions are the specific rubrics for the extended response questions included in this document (questions #15-18). A range of student responses to these extended response questions are included as examples of various points awarded according to the rubric. The examples show one way of answering the question. In most cases there are other acceptable responses.