



**NEW YORK STATE
PROGRAM EVALUATION
TEST**

**Intermediate-Level
Technology
Education Test**

**GUIDE
to Intermediate-Level
Program Evaluation
Forms A, B, C, and D**



The University of the State of New York
THE STATE EDUCATION DEPARTMENT
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FOREWORD

This guide provides information on conducting a program evaluation using the New York State Intermediate-Level Technology Education Test. The Final School Score (*see Appendix A*) can be considered an example of the simplest form of program evaluation. This score will indicate whether your school's program has met the minimum State standards for technology education. We strongly recommend that you conduct a program evaluation using data from the Intermediate-Level Technology Education Test.

The administration of the New York State Intermediate-Level Technology Education Test is optional for both public and nonpublic schools. For the 2002-03 school year, the Department provided schools with two editions of the test, Form A and Form B. Beginning with the 2003-04 school year, the Department is providing a larger set of test forms that includes two additional editions of the test, Form C and Form D, along with Form A and Form B. These four test forms are intended for use by schools during the 2003-04 school year and beyond. Appendices A, B, C, and D of this guide contain materials to use with Form A, Form B, Form C, and Form D of the test respectively.

The process of evaluating a program, as described in this guide, is not a process unique to technology education. The compiling and analyzing of data from objective tests and from other tests and surveys can be done for any program area. Item analysis can provide the link from test to program, suggesting those local program areas where student performance may be weak and, therefore, may need special attention.

CONDUCTING A PROGRAM EVALUATION

The purpose of a program evaluation is to assess the local instructional program by means of written tests and other measurement techniques. Conducting this detailed assessment requires going beyond just collecting student scores. To maximize information about the quality of the program, you should analyze data on individual test items from the Intermediate-Level Technology Education Test along with data from several optional components.

The underlying assumption of the optional components is that effective evaluation of your technology education program involves not only testing the achievement of students but also obtaining information about factors that contribute to your intermediate-level technology education program. These factors affect the program environment as perceived by students, administrators, teachers, and parents/guardians. Elements of the program environment include:

- your school's intermediate-level technology education program and its support for that program
- instructional planning and instructional techniques
- community and home support for the program

Although the program environment data are qualitative in nature, they can help to explain student performance on the Intermediate-Level Technology Education Test. A good program evaluation should include both quantitative and qualitative data. Schools are encouraged to develop their own surveys to collect and analyze this qualitative data.

A high-quality intermediate-level technology education program requires commitment and diligence to develop and implement it and also requires accurate feedback to refine and improve it. By administering, scoring, compiling data on, and analyzing data from the Intermediate-Level Technology Education Test, your school staff will have feedback to identify general areas of strength and weakness in your intermediate-level technology education program. You can then encourage and sustain areas of strength and address areas of weakness with an action plan for program improvement. Program evaluation is a worthwhile process that helps strengthen your intermediate-level technology education program and align the program to the New York State Learning Standards.

Do **not** consider this process of program evaluation a vehicle for teacher evaluation. The abilities of the individuals teaching the program, while important, are not the focus of this effort. To assure the cooperation of school staff in improving the program, administrators must maintain continual awareness and provide continual assurance that the intent is **only** to assess the various aspects of your intermediate-level technology education program. The primary purpose of program evaluation is to provide the best situation for students to achieve the learning standards.

To facilitate program evaluation, this guide provides a series of worksheets and step-by-step directions for analyzing the local data and for developing an action plan for program improvement, based on student performance on the written test.

FINAL SCHOOL SCORES AND STANDARD SETTING

Final School Score

A school's program can be considered to have achieved the NYS Learning Standards for technology education if the Final School Score is 65 or higher. Refer to the appropriate appendix to learn the details of how this score is calculated for each of the forms (A, B, C, and D). The cut point was arrived at through a standard-setting process.

The Standard-Setting Process

A representative group of New York State intermediate-level technology educators participated in a standard-setting process to determine the cut score to be used for program evaluation. They first defined the skills and knowledge that minimally competent intermediate-level technology education students should possess based on the intermediate level of the NYS Learning Standards for technology education. This served as the definition of a minimally competent student.

The standard-setting study used the bookmarking procedure that enables committee members to consider multiple-choice and extended-response items together. In the bookmarking procedure, multiple-choice items and extended-response items are ordered in terms of difficulty. Committee members are asked to apply their judgments to these ordered items. The committee meeting is conducted in rounds. The rounds and the activities employed in each round are given below.

Round	Activity
1	<ul style="list-style-type: none">• Committee members review the NYS Learning Standards for technology.• Committee members discuss how students who have <i>not</i> met the Learning Standards perform in class and on similar assessments.• Committee members discuss the meaning of minimum competence and how that is reflected in student performance.
2	<ul style="list-style-type: none">• Working individually, committee members set their bookmark for having met the Learning Standards. That is, committee members conceive of an individual who has the minimum level of skill and knowledge needed to meet the Learning Standards and indicate the point at which such a student is more likely to miss the item than to answer the item correctly.• Committee members record their responses both on data sheets and in the notebook of ordered items.
3	<ul style="list-style-type: none">• Committee members receive a report of the results of Round 2.• They divide into small groups and discuss the individual results.• Committee members revise their judgments in light of the discussion.• They record their responses both on data sheets and in the notebook of ordered items.

STEPS IN PROGRAM EVALUATION

We recommend that each building/district designate one person to administer the Intermediate-Level Technology Education Test as well as all other aspects of the program evaluation. We also recommend that each building/district establish an intermediate-level technology education committee to plan the administration of the program evaluation and to undertake the following tasks:

- planning the scoring procedures for the Intermediate-Level Technology Education Test, including a decision on whether to hand score or machine score
- planning the procedures to be used in compiling and analyzing additional qualitative data and in developing an action plan for program improvement

DIRECTIONS FOR COMPILING DATA

Using the Worksheets

Appendix A contains worksheets and other information you will need to conduct a program evaluation using data from Form A. Appendices B, C, and D contain the same materials for Forms B, C, and D, respectively. Use the appendix that corresponds to the test form you administer. The worksheets in these appendices will help you compile and display the data needed to conduct an evaluation of your intermediate-level technology education program.

Please note that no one individual is expected to complete all the worksheets. In many schools/districts, the data on individual items will be provided through machine scoring. You do not need to complete the full set of worksheets unless all of the test components administered must be hand scored. Even then, different staff members will probably complete different worksheets. (If your school district has item analysis calculated electronically, you can begin with Worksheet 5.)

The worksheets that tally item responses usually are completed by a building staff member after the students' tests are scored. The remaining worksheets usually are completed by the Intermediate-Level Technology Education Test administrator and/or the technology department chairperson. These worksheets aggregate data for a building and/or a district and summarize and display data in a form that facilitates program evaluation.

Each worksheet includes directions for completing it. When you have completed all worksheets, use Worksheet 7 to identify strengths and weaknesses.

The worksheets derive the following data for Forms A, B, C, and D of the Intermediate-Level Technology Education Test:

- individual local item difficulties
- local average scores for each of the seven key ideas tested

Explanation of Terms Used in Compiling Data

When compiling the data for local programs, the term "item difficulty" is used for the Intermediate-Level Technology Education Test. In general, higher item difficulty numbers indicate items that were "easier" for the group of students tested, while lower item difficulty numbers indicate items that the group found more challenging.

For multiple-choice items, "item difficulty" is defined as the percentage of students in a technology education program who answer each test item correctly. For example, an item difficulty of 75 means that 75% of the students tested answered the item correctly and 25% answered it incorrectly. The higher the item difficulty number, the larger the percentage of students who answered the item correctly.

For extended-response items, "item difficulty" indicates the extent to which a group of students achieved full credit on the item. It is based on the average score of the students tested. For example, if the average score for an item is 1 and the maximum credit possible for that item is 2, the item difficulty is 50. The higher the item difficulty number, the more credit the average student obtained.

A "school score for key idea" is used to examine how the group of students scored in each of the seven key ideas tested. This score is obtained by using the difficulties of all items in each key idea. By aggregating the individual item data in this way, the information provided becomes more reliable. Analyze your aggregated data first and rely on it the most. Individual item data can be of most help in zeroing in on possible reasons for any weaknesses identified in the aggregated data.

NOTE: Do *not* use subscores to evaluate individual student achievement. There are too few questions for each key idea to provide a reliable subscore for an individual student. For example, assume a student had been given a different set of similar questions testing that student's knowledge and understanding of various concepts in a key idea. That student would most likely have received different subscores on the two groups of questions.

Identifying Program Strengths and Weaknesses

After you complete the Summary Sheet (Worksheet 6), look at column 5 (Scores Below Cut Point) for each key idea. If there is a circle in this column, this is an area in which your students performed below the minimum State standard. You should then decide whether this area needs program improvement. Data on Worksheet 5 will identify individual items that your students had difficulty answering.

Now look at column 4 (Scores Above Cut Point) on Worksheet 6 for each key idea. If there is a circle in this column, this is an area in which your students performed above the minimum State standard. This area can be considered a program strength, particularly if the score is near the top of the range.

DIRECTIONS FOR ANALYZING TEST DATA FOR PROGRAM EVALUATION

Follow the directions that appear on each worksheet, being careful to calculate correctly and carry all information forward accurately.

1. Look at Worksheet 6. Do any of the key ideas have a circle in the column titled Score Below Cut Point for Key Idea? Each circle indicates a key idea area in which your students performed below the State standard. These areas may need program improvement. List the relevant key idea(s) in the Program Weaknesses column on Worksheet 7. Refer to the appropriate appendix for the cross-reference of the key idea to the syllabus and Learning Standards 3 and 4. You may want to list these areas in the Program Weaknesses column as well.
2. Look at Worksheet 6. Do any of the key ideas have a circle in the column titled Score Above Cut Point for Key Idea? Each circle indicates a key idea area in which your students performed above the State standard. These are areas for which your intermediate-level technology education program is successful. List the relevant key idea(s) in the Program Strengths column on Worksheet 7. Refer to the appropriate appendix for the cross-reference of the key idea to the syllabus and Learning Standards 3 and 4. You may want to list these areas in the Program Strengths column as well.
3. Look at the Local Difficulties column in Worksheet 5. Are any of the Local Difficulties extremely low (less than 40)? You might want to make a list of the more specific syllabus and Learning Standards references for those items. These may serve to identify specific content understandings and/or skills that are problematic for your students.
4. To provide feedback and recommendations to programs, the Office of Curriculum and Instruction is collecting school score information so that a statewide analysis can be completed. See Appendix E to participate in this data collection effort.

Information for Conducting a Program Evaluation Using Form A

APPENDIX A

***Note:* Use Worksheets 1-4 if you are hand scoring your students' tests. If your school is provided with item analysis data, begin with Worksheet 5.**

Conversion Table for Form A



Determining the Final School Score Intermediate-Level Technology Education Test — Form A

Determine each student’s total raw score by adding the student’s raw scores on Part I and Part II of the test. Find the average of all students’ raw scores to determine the School Raw Score. To determine the Final School Score, locate the School Raw Score in the table below. Circle this score. The Final School Score for that raw score is in the adjacent column. Circle this score.

A Final School Score of 65 or higher (shaded area) indicates that your school’s technology education program is meeting the New York State Learning Standards for technology education. A Final School Score of less than 65 indicates that your school’s technology education program is not meeting the New York State Learning Standards for technology education and may need improvement in some areas.

Note: Use this table for Form A *only* and for school scores *only*.

School Raw Score	Final School Score
60	100
59	99
58	97
57	94
56	93
55	91
54	89
53	87
52	85
51	83
50	82
49	80
48	78
47	76
46	74
45	72
44	71
43	69
42	67
41	65
40	63
39	61
38	59
37	58
36	56
35	54
34	52
33	50
32	48
31	47
30	45

School Raw Score	Final School Score
29	43
28	41
27	39
26	37
25	36
24	34
23	32
22	30
21	28
20	26
19	24
18	23
17	21
16	19
15	17
14	15
13	13
12	12
11	10
10	9
9	8
8	7
7	6
6	5
5	4
4	3
3	2
2	1
1	1
0	0

Intermediate-Level Technology Education Test — Form A



Reference of Individual Test Items to *New York State Learning Standards for Mathematics, Science, and Technology (Intermediate Level)* and the NYS Technology Education Syllabus

Item Number	Credit Per Item	Item Type*	Reference to Standard 5 Technology	Reference to Syllabus	Reference to Standard 3 Mathematics	Reference to Standard 4 Science	Reference to Standard 4 Science
			(Key Idea)	Module	(Key Idea)	Physical Setting	Living Environment
1-10	1	MC	1	T-3, 6, 10	1, 2, 4, 5, 7	2, 3, 4, 5	1, 2, 4, 7
11-20	1	MC	2	T-2, 6, 7	2, 4, 5, 7	3, 4, 5	1
21-30	1	MC	3	T-1, 8	2, 3, 4, 5	1, 3, 4, 5	5
31-34	1	MC	4	T-4, 8, 10	1, 2, 3, 4, 5, 7	1, 2, 3, 4, 5	1, 4, 5, 7
35-37	1	MC	5	T-1	2, 3, 4, 5	1, 3, 4, 5	—
38	1	MC	6	T-1, 5, 9	2, 3, 4, 5	1, 2, 3, 4, 5, 6	4, 5, 6, 7
39-40	1	MC	7	T-2, 9	2, 4, 5, 6	3, 4	4, 5, 6, 7
41	3	ER	1	T-3, 6, 10	1, 2, 4, 5, 7	2, 3, 4, 5	1, 2, 4, 7
42	2	ER	2	T-2, 6, 7	2, 4, 5, 7	3, 4, 5	1
43	3	ER	2	T-2, 6, 7	2, 4, 5, 7	3, 4, 5	1
44	2	ER	3	T-1, 8	2, 3, 4, 5	1, 3, 4, 5	5
45	2	ER	6	T-1, 5, 9	2, 3, 4, 5	1, 2, 3, 4, 5, 6	4, 5, 6, 7
46	2	ER	4	T-4, 8, 10	1, 2, 3, 4, 5, 7	1, 2, 3, 4, 5	1, 4, 5, 7
47	3	ER	5	T-1	2, 3, 4, 5	1, 3, 4, 5	—
48	3	ER	7	T-2, 9	2, 4, 5, 6	3, 4	4, 5, 6, 7

* MC = multiple choice

ER = extended-response question



**INDIVIDUAL CLASS WORKSHEET — Technology Education
Item Difficulty — Multiple-Choice Items (Part 1)**

Directions:

1. Make a copy of this worksheet for each class. Spaces are provided for 30 students.
2. Record the Class No. in the space at the top right.
3. Record in the box below the total number of students in the class who took the test.
4. Spread a convenient number of corrected answer sheets (6-10) side by side across a table so that for each answer sheet an entire response column is visible and each row is aligned.
Tally the number of incorrect or blank responses for each item.
5. Continue to spread out answer sheets and tally the number of incorrect or blank responses until all answer sheets have been tallied.
6. Determine and record the number of correct responses for each item.
Use this formula: No. of Students – Total No. of Incorrect or Blank Responses
7. Transfer the number of students and the number of correct responses for each item to Worksheet 2.

No. of Students

Item #	Total No. of Incorrect or Blank Responses	Total No. of Correct Responses
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		

Item #	Total No. of Incorrect or Blank Responses	Total No. of Correct Responses
21		
22		
23		
24		
25		
26		
27		
28		
29		
30		
31		
32		
33		
34		
35		
36		
37		
38		
39		
40		

**FORM A
WORKSHEET 2**

Building/District Name _____



**BUILDING/DISTRICT WORKSHEET – Technology Education
Item Difficulty – Multiple-Choice Items (Part I)**

Directions:

1. From Worksheet 1 for each class, record in the shaded area below the number of students who took the test. Complete the column for each class by recording the number of correct responses for each item.
2. Total the rows to determine the total number of students and the total number of correct responses to each item.
3. For each item, determine and record the item difficulty using the row totals.
Use this formula: $(\text{Total Number of Correct Responses} / \text{Total Number of Students}) \times 100$
4. Transfer the item difficulty for each item to the Local Difficulty column on Worksheet 5.

Item Number	Class and Number of Students										Row Totals	Item Difficulty	
	1	2	3	4	5	6	7	8	9	10			
1													
2													
3													
4													
5													
6													
7													
8													
9													
10													
11													
12													
13													
14													
15													
16													
17													
18													
19													
20													
21													
22													
23													
24													
25													
26													
27													
28													
29													
30													
31													
32													
33													
34													
35													
36													
37													
38													
39													
40													

**FORM A
WORKSHEET 3**

Class No. _____



**INDIVIDUAL CLASS WORKSHEET — Technology Education
Item Difficulty — Extended Response Items (Part II)**

Directions:

1. Make a copy of this worksheet for each class. Spaces are provided for 30 students.
2. Record the Class No. in the space at the top right.
3. Record in the box below the total number of students in the class who took the test.
4. From each student's test booklet, record in the appropriate column the student's score for each extended-response item.
5. Total each item column to determine the total class score for each item.
6. Transfer the number of students and the total class score for each item to Worksheet 4.

--

No. of Students

Student Scores for Open-ended Items (Part II)

Student	Item Number							
	41	42	43	44	45	46	47	48
1								
2								
3								
4								
5								
6								
7								
8								
9								
10								
11								
12								
13								
14								
15								
16								
17								
18								
19								
20								
21								
22								
23								
24								
25								
26								
27								
28								
29								
30								
Total Class Score								



**BUILDING/DISTRICT WORKSHEET — Technology Education
Item Difficulty — Extended-Response Items (Part II)**

Directions:

1. From Worksheet 3 for each class, record in the shaded area the number of students who took the test. Complete the column for each class by recording the total class score for each item.
2. Total the rows to determine the total number of students and the total score for each item.
3. Determine the mean score for each item using the row totals (round to the nearest .01).
Use this formula: $(\text{Row Total for Item} / \text{Total Number of Students})$
4. Record this mean score in the column indicated on this worksheet and on Worksheet 5.
5. Convert the mean item score for each item to an item difficulty (round to the nearest whole number).
Use this formula: $[(\text{Mean Item Score} / \text{Maximum Item Score}) \times 100]$
6. Transfer each item difficulty to the Local Difficulty column on Worksheet 5.

	Item Number	Class and Number of Students										Row Totals	Mean Item Score	Max Item Score	Item Difficulty
		1	2	3	4	5	6	7	8	9	10				
Total Class Score for Each Extended-Response Item in Part II	41													3	
	42													2	
	43													3	
	44													2	
	45													2	
	46													2	
	47													3	
	48													3	

**FORM A
WORKSHEET 5**

Building/District Name _____



**SUMMARY SHEET — Technology Education
Item Difficulty for Individual Test Items**

Directions:

1. Transfer local difficulties to this sheet from Worksheets 2 and 4.
2. Calculate and record the mean score for each block of multiple-choice (MC) items.
Use this formula: (Total of Item Difficulties / 100)
3. Transfer mean scores for the extended-response items (ER) to this sheet from Worksheet 4.

Item #	Item Type	Reference to Standard 5	Local Difficulty	Mean Score
		Technology (Key Ideas)		
1	MC	1		
2	MC	1		
3	MC	1		
4	MC	1		
5	MC	1		
6	MC	1		
7	MC	1		
8	MC	1		
9	MC	1		
10	MC	1		
11	MC	2		
12	MC	2		
13	MC	2		
14	MC	2		
15	MC	2		
16	MC	2		
17	MC	2		
18	MC	2		
19	MC	2		
20	MC	2		

Item #	Item Type	Reference to Standard 5	Local Difficulty	Mean Score
		Technology (Key Ideas)		
21	MC	3		
22	MC	3		
23	MC	3		
24	MC	3		
25	MC	3		
26	MC	3		
40	MC	3		
27	MC	3		
28	MC	3		
29	MC	3		
30	MC	3		
31	MC	4		
32	MC	4		
33	MC	4		
34	MC	4		
35	MC	5		
36	MC	5		
37	MC	5		
38	MC	6		
39	MC	7		
40	MC	7		
41	ER	1		
42	ER	2		
43	ER	2		
44	ER	3		
46	ER	4		
47	ER	5		
45	ER	6		
48	ER	7		

Note: If your school has item analysis done electronically, record the item difficulty for each item on this worksheet. Then follow step 2 above for the multiple-choice items 1–40.

For step 3, you may need to determine the mean score for items 41–47 if this value is not provided in your item analysis. This score can be calculated by multiplying the item difficulty by the maximum number of points for the item and dividing by 100.

Use this formula: (Item Difficulty x Max Points) / 100



**SUMMARY SHEET — Technology Education
School Scores for Key Ideas in Standard 5**

Directions:

1. *a.* From Worksheet 5, add the mean scores for the items listed in column 2 for each key idea.
b. Record the total in the column labeled School Score for Key Idea.
2. *a.* Look at the score range provided in the Scores Above Cut Point column.
b. If the School Score for Key Idea falls in the range given, circle the range.
c. List the key idea in the Program Strengths column in Worksheet 7.
3. *a.* Look at the score range provided in the Scores Below Cut Point column.
b. If the School Score for Key Idea falls in the range given, circle the range.
c. List the key idea in the Program Weaknesses column in Worksheet 7.

Items Grouped by Key Idea in Learning Standard 5

Key Idea	Item Numbers	School Score for Key Idea	Scores Above Cut Point for Key Idea	Scores Below Cut Point for Key Idea
1. Engineering Design	1–10, 41		8–13	0–7
2. Tools, Resources, and Technological Processes	11–20, 42, 43		11–15	0–10
3. Computer Technology	21–30, 44		8–12	0–7
4. Systems	31–34, 46		5–6	0–4
5. History and Evolution of Technology	35–37, 47		5–6	0–4
6. Impacts of Technology	38, 45		3	0–2
7. Management of Technology	39–40, 48		4–5	0–3



PROGRAM STRENGTHS AND WEAKNESSES — Technology Education

Program Strengths		Program Weaknesses	
Key Idea in Standard 5	Reference to Syllabus and/or Standards 3 and 4 (see page 9)	Key Idea in Standard 5	Reference to Syllabus and/or Standards 3 and 4 (see page 9)

Information for Conducting a Program Evaluation Using Form B

APPENDIX B

***Note:* Use Worksheets 1-4 if you are hand scoring your students' tests. If your school is provided with item analysis data, begin with Worksheet 5.**

Conversion Table for Form B

B

Determining the Final School Score Intermediate-Level Technology Education Test — Form B

Determine each student’s total raw score by adding the student’s raw scores on Part I and Part II of the test. Find the average of all students' raw scores to determine the School Raw Score. To determine the Final School Score, locate the School Raw Score in the table below. Circle this score. The Final School Score for that raw score is in the adjacent column. Circle this score.

A Final School Score of 65 or higher (shaded area) indicates that your school’s technology education program is meeting the New York State Learning Standards for technology education. A Final School Score of less than 65 indicates that your school’s technology education program is not meeting the New York State Learning Standards for technology education and may need improvement in some areas.

Note: Use this table for Form B *only* and for school scores *only*.

School Raw Score	Final School Score
62	100
61	98
60	96
59	93
58	92
57	90
56	88
55	86
54	84
53	83
52	81
51	79
50	78
49	76
48	74
47	72
46	71
45	70
44	68
43	67
42	65
41	63
40	61
39	60
38	58
37	56
36	54
35	52
34	50
33	49
32	47

School Raw Score	Final School Score
31	46
30	44
29	42
28	40
27	38
26	37
25	35
24	34
23	32
22	30
21	28
20	26
19	24
18	23
17	21
16	19
15	17
14	15
13	13
12	12
11	10
10	9
9	8
8	7
7	6
6	5
5	4
4	3
3	2
2	1
1	1
0	0

Intermediate-Level Technology Education Test — Form B

B

Reference of Individual Test Items to *New York State Learning Standards for Mathematics, Science, and Technology (Intermediate Level)* and the NYS Technology Education Syllabus

Item Number	Credit per Item	Item Type*	Reference to Standard 5 Technology	Reference to Syllabus	Reference to Standard 3 Mathematics	Reference to Standard 4 Science	Reference to Standard 4 Science
			(Key Idea)	Module	(Key Idea)	Physical Setting	Living Environment
1–10	1	MC	1	T–3, 6, 10	1, 2, 4, 5, 7	2, 3, 4, 5	1, 2, 4, 7
11–21	1	MC	2	T–2, 6, 7	2, 4, 5, 7	3, 4, 5	1
22–29	1	MC	3	T–1, 8	2, 3, 4, 5	1, 3, 4, 5	5
30–33	1	MC	4	T–4, 8, 10	1, 2, 3, 4, 5, 7	1, 2, 3, 4, 5	1, 4, 5, 7
34–36	1	MC	5	T–1	2, 3, 4, 5	1, 3, 4, 5	—
37	1	MC	6	T–1, 5, 9	2, 3, 4, 5	1, 2, 3, 4, 5, 6	4, 5, 6, 7
38–40	1	MC	7	T–2, 9	2, 4, 5, 6	3, 4	4, 5, 6, 7
41	3	ER	1	T–3, 6, 10	1, 2, 4, 5, 7	2, 3, 4, 5	1, 2, 4, 7
42	2	ER	2	T–2, 6, 7	2, 4, 5, 7	3, 4, 5	1
43	3	ER	2	T–2, 6, 7	2, 4, 5, 7	3, 4, 5	1
44	2	ER	3	T–1, 8	2, 3, 4, 5	1, 3, 4, 5	5
45	3	ER	3	T–1, 8	2, 3, 4, 5	1, 3, 4, 5	5
46	2	ER	4	T–4, 8, 10	1, 2, 3, 4, 5, 7	1, 2, 3, 4, 5	1, 4, 5, 7
47	2	ER	5	T–1	2, 3, 4, 5	1, 3, 4, 5	—
48	3	ER	7	T–2, 9	2, 4, 5, 6	3, 4	4, 5, 6, 7
49	2	ER	6	T–1, 5, 9	2, 3, 4, 5	1, 2, 3, 4, 5, 6	4, 5, 6, 7

* MC = multiple choice

ER = extended-response question

FORM B
WORKSHEET 1

Class No. _____

B

INDIVIDUAL CLASS WORKSHEET — Technology Education
Item Difficulty — Multiple-Choice Items (Part 1)

Directions:

1. Make a copy of this worksheet for each class. Spaces are provided for 30 students.
2. Record the Class No. in the space at the top right.
3. Record in the box below the total number of students in the class who took the test.
4. Spread a convenient number of corrected answer sheets (6-10) side by side across a table so that an entire response column is visible for each answer sheet and each row is aligned.
Tally the number of incorrect or blank responses for each item.
5. Continue to spread out answer sheets and tally the number of incorrect or blank responses until all answer sheets have been tallied.
6. Determine and record the number of correct responses for each item.
Use this formula: No. of Students – Total No. of Incorrect or Blank Responses
7. Transfer the number of students and the number of correct responses for each item to Worksheet 2.

No. of Students

Item #	Total No. of Incorrect or Blank Responses	Total No. of Correct Responses
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		

Item #	Total No. of Incorrect or Blank Responses	Total No. of Correct Responses
21		
22		
23		
24		
25		
26		
27		
28		
29		
30		
31		
32		
33		
34		
35		
36		
37		
38		
39		
40		

**FORM B
WORKSHEET 2**

Building/District Name _____

B

**BUILDING/DISTRICT WORKSHEET — Technology Education
Item Difficulty — Multiple-Choice Items (Part I)**

Directions:

1. From Worksheet 1 for each class, record in the shaded area the number of students who took the test. Complete the column for each class by recording the number of correct responses for each item.
2. Total the rows to determine the total number of students and the total number of correct responses to each item.
3. For each item, determine and record the item difficulty using the row totals. Use this formula: (Total Number of Correct Responses / Total Number of Students) x 100
4. Transfer the item difficulty for each item to the Local Difficulty column on Worksheet 5.

Item Number	Class and Number of Students										Row Totals	Item Difficulty	
	1	2	3	4	5	6	7	8	9	10			
1													
2													
3													
4													
5													
6													
7													
8													
9													
10													
11													
12													
13													
14													
15													
16													
17													
18													
19													
20													
21													
22													
23													
24													
25													
26													
27													
28													
29													
30													
31													
32													
33													
34													
35													
36													
37													
38													
39													
40													

Number of Correct Responses to Each Multiple-Choice Item for Each Class

**FORM B
WORKSHEET 3**

Class No. _____

B

**INDIVIDUAL CLASS WORKSHEET — Technology Education
Item Difficulty — Extended Response Items (Part II)**

Directions:

1. Make a copy of this worksheet for each class. Spaces are provided for 30 students.
2. Record the Class No. in the space at the top right.
3. Record in the box below the total number of students in the class who took the test.
4. From each student's test booklet, record in the appropriate column the student's score for the each extended-response item.
5. Total each item column to determine the total class score for each item.
6. Transfer the number of students and the total class score for each item to Worksheet 4.

--

No. of Students

Student Scores for Open-ended Items (Part II)

Student	Item Number								
	41	42	43	44	45	46	47	48	49
1									
2									
3									
4									
5									
6									
7									
8									
9									
10									
11									
12									
13									
14									
15									
16									
17									
18									
19									
20									
21									
22									
23									
24									
25									
26									
27									
28									
29									
30									
Total Class Score									

BUILDING/DISTRICT WORKSHEET — Technology Education
Item Difficulty — Extended-Response Items (Part II)

Directions:

1. From Worksheet 3 for each class, record in the shaded area the number of students who took the test. Complete the column for each class by recording the total class score for each item.
2. Total the rows to determine the total number of students and the total score for each item.
3. Determine the mean score for each item using the row totals (round to the nearest .01).
Use this formula: $(\text{Row Total for Item} / \text{Total Number of Students})$
4. Record this mean score in the column indicated on this worksheet *and* on Worksheet 5.
5. Convert the mean item score for each item to an item difficulty (round to the nearest whole number).
Use this formula: $[(\text{Mean Item Score} / \text{Maximum Item Score}) \times 100]$
6. Transfer each item difficulty to the Local Difficulty column on Worksheet 5.

	Item Number	Class and Number of Students										Row Totals	Mean Item Score	Max Item Score	Item Difficulty
		1	2	3	4	5	6	7	8	9	10				
Total Class Score for Each Extended-Response Item in Part II	41													3	
	42													2	
	43													3	
	44													2	
	45													3	
	46													2	
	47													2	
	48													3	
	49													2	

**FORM B
WORKSHEET 5**

Building/District Name _____

B

**SUMMARY SHEET — Technology Education
Item Difficulty for Individual Test Items**

Directions:

1. Transfer local difficulties to this sheet from Worksheets 2 and 4.
2. Calculate and record the mean score for each block of multiple-choice (MC) items.
Use this formula: (Total of Item Difficulties / 100)
3. Transfer mean scores for the extended-response items (ER) to this sheet from Worksheet 4.

Item #	Item Type	Reference to Standard 5	Local Difficulty	Mean Score
		Technology (Key Ideas)		
1	MC	1		
2	MC	1		
3	MC	1		
4	MC	1		
5	MC	1		
6	MC	1		
7	MC	1		
8	MC	1		
9	MC	1		
10	MC	1		
11	MC	2		
12	MC	2		
13	MC	2		
14	MC	2		
15	MC	2		
16	MC	2		
17	MC	2		
18	MC	2		
19	MC	2		
20	MC	2		
21	MC	2		

Item #	Item Type	Reference to Standard 5	Local Difficulty	Mean Score
		Technology (Key Ideas)		
22	MC	3		
23	MC	3		
24	MC	3		
25	MC	3		
26	MC	3		
40	MC	3		
27	MC	3		
28	MC	3		
29	MC	3		
30	MC	4		
31	MC	4		
32	MC	4		
33	MC	4		
34	MC	5		
35	MC	5		
36	MC	5		
37	MC	6		
38	MC	7		
39	MC	7		
40	MC	7		
41	ER	1		
42	ER	2		
43	ER	2		
44	ER	3		
45	ER	3		
46	ER	4		
47	ER	5		
49	ER	6		
48	ER	7		

Note: If your school has item analysis done electronically, record the item difficulty for each item on this worksheet. Then follow step 2 above for the multiple-choice items 1–40.

For step 3, you may need to determine the mean score for items 41–47 if this value is not provided in your item analysis. This score can be calculated by multiplying the item difficulty by the maximum number of points for the item and dividing by 100.

Use this formula: (Item Difficulty x Max Points) / 100

**FORM B
WORKSHEET 6**

Building/District Name _____

B

**SUMMARY SHEET — Technology Education
School Scores for Key Ideas in Standard 5**

Directions:

1. *a.* From Worksheet 5, add the mean scores for the items listed in column 2 for each key idea.
b. Record the total in the column labeled School Score for Key Idea.
2. *a.* Look at the score range provided in the Scores Above Cut Point column.
b. If the School Score for Key Idea falls in the range given, circle the range.
c. List the key idea in the Program Strengths column in Worksheet 7.
3. *a.* Look at the score range provided in the Scores Below Cut Point column.
b. If the School Score for Key Idea falls in the range given, circle the range.
c. List the key idea in the Program Weaknesses column in Worksheet 7.

Items Grouped by Key Idea in Learning Standard 5

Key Idea	Item Numbers	School Score for Key Idea	Scores Above Cut Point for Key Idea	Scores Below Cut Point for Key Idea
1. Engineering Design	1–10, 41		8–13	0–7
2. Tools, Resources, and Technological Processes	11–21, 42, 43		11–16	0–10
3. Computer Technology	22–29, 44, 45		11–13	0–10
4. Systems	30–33, 46		5–6	0–4
5. History and Evolution of Technology	34–36, 47		4–5	0–3
6. Impacts of Technology	37, 49		3	0–2
7. Management of Technology	38–40, 48		4–6	0–3

PROGRAM STRENGTHS AND WEAKNESSES — Technology Education

Program Strengths		Program Weaknesses	
Key Idea in Standard 5	Reference to Syllabus and/or Standards 3 and 4 (see page 19)	Key Idea in Standard 5	Reference to Syllabus and/or Standards 3 and 4 (see page 19)

Information for Conducting a Program Evaluation Using Form C

APPENDIX C

***Note:* Use Worksheets 1-4 if you are hand scoring your students' tests. If your school is provided with item analysis data, begin with Worksheet 5.**

Conversion Table for Form C



Determining the Final School Score Intermediate-Level Technology Education Test — Form C

Determine each student’s total raw score by adding the student’s raw scores on Part I and Part II of the test. Find the average of all students' raw scores to determine the School Raw Score. To determine the Final School Score, locate the School Raw Score in the table below. Circle this score. The Final School Score for that raw score is in the adjacent column. Circle this score.

A Final School Score of 65 or higher (shaded area) indicates that your school’s technology education program is meeting the New York State Learning Standards for technology education. A Final School Score of less than 65 indicates that your school’s technology education program is not meeting the New York State Learning Standards for technology education and may need improvement in some areas.

Note: Use this table for Form C *only* and for school scores *only*.

School Raw Score	Final School Score
60	100
59	97
58	94
57	90
56	86
55	82
54	78
53	74
52	72
51	70
50	67
49	65
48	62
47	60
46	58
45	56
44	54
43	52
42	50
41	48
40	47
39	44
38	42
37	41
36	39
35	37
34	36
33	34
32	32
31	30
30	29

School Raw Score	Final School Score
29	27
28	25
27	24
26	23
25	22
24	20
23	18
22	17
21	15
20	14
19	13
18	12
17	11
16	11
15	10
14	9
13	9
12	8
11	7
10	7
9	6
8	5
7	5
6	4
5	3
4	3
3	2
2	2
1	1
0	0

Intermediate-Level Technology Education Test — Form C

C

Reference of Individual Test Items to *New York State Learning Standards for Mathematics, Science, and Technology (Intermediate Level)* and the NYS Technology Education Syllabus

Item Number	Credit Per Item	Item Type*	Reference to Standard 5 Technology	Reference to Syllabus	Reference to Standard 3 Mathematics	Reference to Standard 4 Science	Reference to Standard 4 Science
			(Key Idea)	Module	(Key Idea)	Physical Setting	Living Environment
1-8	1	MC	1	T-3, 6, 10	1, 2, 4, 5, 7	2, 3, 4, 5	1, 2, 4, 7
9-19	1	MC	2	T-2, 6, 7	2, 4, 5, 7	3, 4, 5	1
20-26, 40	1	MC	3	T-1, 8	2, 3, 4, 5	1, 3, 4, 5	5
27-31	1	MC	4	T-4, 8, 10	1, 2, 3, 4, 5, 7	1, 2, 3, 4, 5	1, 4, 5, 7
32-33	1	MC	5	T-1	2, 3, 4, 5	1, 3, 4, 5	—
34-36	1	MC	6	T-1, 5, 9	2, 3, 4, 5	1, 2, 3, 4, 5, 6	4, 5, 6, 7
37-39	1	MC	7	T-2, 9	2, 4, 5, 6	3, 4	4, 5, 6, 7
41	2	ER	1	T-3, 6, 10	1, 2, 4, 5, 7	2, 3, 4, 5	1, 2, 4, 7
42	2	ER	2	T-2, 6, 7	2, 4, 5, 7	3, 4, 5	1
43	3	ER	3	T-1, 8	2, 3, 4, 5	1, 3, 4, 5	5
44	4	ER	4	T-4, 8, 10	1, 2, 3, 4, 5, 7	1, 2, 3, 4, 5	1, 4, 5, 7
45	3	ER	5	T-1	2, 3, 4, 5	1, 3, 4, 5	—
46	3	ER	6	T-1, 5, 9	2, 3, 4, 5	1, 2, 3, 4, 5, 6	4, 5, 6, 7
47	3	ER	7	T-2, 9	2, 4, 5, 6	3, 4	4, 5, 6, 7

* MC = multiple choice

ER = extended-response question

**INDIVIDUAL CLASS WORKSHEET — Technology Education
Item Difficulty — Multiple-Choice Items (Part 1)**

Directions:

1. Make a copy of this worksheet for each class. Spaces are provided for 30 students.
2. Record the Class No. in the space at the top right.
3. Record in the box below the total number of students in the class who took the test.
4. Spread a convenient number of corrected answer sheets (6-10) side by side across a table so that for each answer sheet an entire response column is visible and each row is aligned. Tally the number of incorrect or blank responses for each item.
5. Continue to spread out answer sheets and tally the number of incorrect or blank responses until all answer sheets have been tallied.
6. Determine and record the number of correct responses for each item.
Use this formula: No. of Students – Total No. of Incorrect or Blank Responses
7. Transfer the number of students and the number of correct responses for each item to Worksheet 2.

	No. of Students
--	------------------------

Item #	Total No. of Incorrect or Blank Responses	Total No. of Correct Responses
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		

Item #	Total No. of Incorrect or Blank Responses	Total No. of Correct Responses
21		
22		
23		
24		
25		
26		
27		
28		
29		
30		
31		
32		
33		
34		
35		
36		
37		
38		
39		
40		

**FORM C
WORKSHEET 2**

Building/District Name _____



**BUILDING/DISTRICT WORKSHEET — Technology Education
Item Difficulty — Multiple-Choice Items (Part I)**

Directions:

1. From Worksheet 1 for each class, record in the shaded area below the number of students who took the test. Complete the column for each class by recording the number of correct responses for each item.
2. Total the rows to determine the total number of students and the total number of correct responses to each item.
3. For each item, determine and record the item difficulty using the row totals.
Use this formula: $(\text{Total Number of Correct Responses} / \text{Total Number of Students}) \times 100$
4. Transfer the item difficulty for each item to the Local Difficulty column on Worksheet 5.

Item Number	Class and Number of Students										Row Totals	Item Difficulty	
	1	2	3	4	5	6	7	8	9	10			
1													
2													
3													
4													
5													
6													
7													
8													
9													
10													
11													
12													
13													
14													
15													
16													
17													
18													
19													
20													
21													
22													
23													
24													
25													
26													
27													
28													
29													
30													
31													
32													
33													
34													
35													
36													
37													
38													
39													
40													

**FORM C
WORKSHEET 3**

Class No. _____



**INDIVIDUAL CLASS WORKSHEET — Technology Education
Item Difficulty — Extended Response Items (Part II)**

Directions:

1. Make a copy of this worksheet for each class. Spaces are provided for 30 students.
2. Record the Class No. in the space at the top right.
3. Record in the box below the total number of students in the class who took the test.
4. From each student's test booklet, record in the appropriate column the student's score for the each extended-response item.
5. Total each item column to determine the total class score for each item.
6. Transfer the number of students and the total class score for each item to Worksheet 4.

No. of Students

Student Scores for Open-ended Items (Part II)

Student	Item Number						
	41	42	43	44	45	46	47
1							
2							
3							
4							
5							
6							
7							
8							
9							
10							
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							
21							
22							
23							
24							
25							
26							
27							
28							
29							
30							
Total Class Score							

**BUILDING/DISTRICT WORKSHEET — Technology Education
Item Difficulty — Extended-Response Items (Part II)**

Directions:

1. From Worksheet 3 for each class, record in the shaded area the number of students who took the test. Complete the column for each class by recording the total class score for each item.
2. Total the rows to determine the total number of students and the total score for each item.
3. Determine the mean score for each item using the row totals (round to the nearest .01).
Use this formula: $(\text{Row Total for Item} / \text{Total Number of Students})$
4. Record this mean score in the column indicated on this worksheet and on Worksheet 5.
5. Convert the mean item score for each item to an item difficulty (round to the nearest whole number).
Use this formula: $[(\text{Mean Item Score} / \text{Maximum Item Score}) \times 100]$
6. Transfer each item difficulty to the Local Difficulty column on Worksheet 5.

	Item Number	Class and Number of Students										Row Totals	Mean Item Score	Max Item Score	Item Difficulty
		1	2	3	4	5	6	7	8	9	10				
Total Class Score for Each Extended-Response Item in Part II	41													2	
	42													2	
	43													3	
	44													4	
	45													3	
	46													3	
	47													3	

**FORM C
WORKSHEET 5**

Building/District Name _____



**SUMMARY SHEET — Technology Education
Item Difficulty for Individual Test Items**

Directions:

1. Transfer local difficulties to this sheet from Worksheets 2 and 4.
2. Calculate and record the mean score for each block of multiple-choice (MC) items.
Use this formula: (Total of Item Difficulties / 100)
3. Transfer mean scores for the extended-response items (ER) to this sheet from Worksheet 4.

Item #	Item Type	Reference to Standard 5	Local Difficulty	Mean Score
		Technology (Key Ideas)		
1	MC	1		
2	MC	1		
3	MC	1		
4	MC	1		
5	MC	1		
6	MC	1		
7	MC	1		
8	MC	1		
9	MC	2		
10	MC	2		
11	MC	2		
12	MC	2		
13	MC	2		
14	MC	2		
15	MC	2		
16	MC	2		
17	MC	2		
18	MC	2		
19	MC	2		

Item #	Item Type	Reference to Standard 5	Local Difficulty	Mean Score
		Technology (Key Ideas)		
20	MC	3		
21	MC	3		
22	MC	3		
23	MC	3		
24	MC	3		
25	MC	3		
26	MC	3		
40	MC	3		
27	MC	4		
28	MC	4		
29	MC	4		
30	MC	4		
31	MC	4		
32	MC	5		
33	MC	5		
34	MC	6		
35	MC	6		
36	MC	6		
37	MC	7		
38	MC	7		
39	MC	7		
41	ER	1		
42	ER	2		
43	ER	3		
44	ER	4		
45	ER	5		
46	ER	6		
47	ER	7		

Note: If your school has item analysis done electronically, record the item difficulty for each item on this worksheet. Then follow step 2 above for the multiple-choice items 1–40.

For step 3, you may need to determine the mean score for items 41–47 if this value is not provided in your item analysis. This score can be calculated by multiplying the item difficulty by the maximum number of points for the item and dividing by 100.

Use this formula: (Item Difficulty x Max Points) / 100

**SUMMARY SHEET — Technology Education
School Scores for Key Ideas in Standard 5**

Directions:

1. *a.* From Worksheet 5, add the mean scores for the items listed in column 2 for each key idea.
b. Record the total in the column labeled School Score for Key Idea.
2. *a.* Look at the score range provided in the Scores Above Cut Point column.
b. If the School Score for Key Idea falls in the range given, circle the range.
c. List the key idea in the Program Strengths column in Worksheet 7.
3. *a.* Look at the score range provided in the Scores Below Cut Point column.
b. If the School Score for Key Idea falls in the range given, circle the range.
c. List the key idea in the Program Weaknesses column in Worksheet 7.

Items Grouped by Key Idea in Learning Standard 5

Key Idea	Item Numbers	School Score for Key Idea	Scores Above Cut Point for Key Idea	Scores Below Cut Point for Key Idea
1. Engineering Design	1–8, 41		9–10	0–8
2. Tools, Resources, and Technological Processes	9–19, 42		12–13	0–11
3. Computer Technology	20–26, 40, 43		10–11	0–9
4. Systems	27–31, 44		7–9	0–6
5. History and Evolution of Technology	32–33, 45		5	0–4
6. Impacts of Technology	34–36, 46		6	0–5
7. Management of Technology	37–39, 47		4–6	0–3

PROGRAM STRENGTHS AND WEAKNESSES — Technology Education

Program Strengths		Program Weaknesses	
Key Idea in Standard 5	Reference to Syllabus and/or Standards 3 and 4 (see page 29)	Key Idea in Standard 5	Reference to Syllabus and/or Standards 3 and 4 (see page 29)

Information for Conducting a Program Evaluation Using Form D

APPENDIX D

***Note:* Use Worksheets 1-4 if you are hand scoring your students' tests. If your school is provided with item analysis data, begin with Worksheet 5.**

Conversion Table for Form D

D

Determining the Final School Score Intermediate-Level Technology Education Test — Form D

Determine each student’s total raw score by adding the student’s raw scores on Part I and Part II of the test. Find the average of all students' raw scores to determine the School Raw Score. To determine the Final School Score, locate the School Raw Score in the table below. Circle this score. The Final School Score for that raw score is in the adjacent column. Circle this score.

A Final School Score of 65 or higher (shaded area) indicates that your school’s technology education program is meeting the New York State Learning Standards for technology education. A Final School Score of less than 65 indicates that your school’s technology education program is not meeting the New York State Learning Standards for technology education and may need improvement in some areas.

Note: Use this table for Form D *only* and for school scores *only*.

School Raw Score	Final School Score	School Raw Score	Final School Score
61	100	30	34
60	98	29	33
59	95	28	31
58	93	27	29
57	90	26	27
56	88	25	25
55	85	24	24
54	83	23	23
53	81	22	21
52	79	21	19
51	76	20	18
50	74	19	16
49	72	18	14
48	70	17	13
47	67	16	12
46	65	15	10
45	63	14	9
44	61	13	9
43	59	12	8
42	57	11	7
41	55	10	6
40	53	9	6
39	51	8	5
38	49	7	4
37	47	6	4
36	45	5	3
35	43	4	3
34	41	3	2
33	39	2	2
32	37	1	1
31	36	0	0

Intermediate-Level Technology Education Test — Form D

D

Reference of Individual Test Items to *New York State Learning Standards for Mathematics, Science, and Technology (Intermediate Level)* and the NYS Technology Education Syllabus

Item Number	Credit per Item	Item Type*	Reference to Standard 5 Technology	Reference to Syllabus	Reference to Standard 3 Mathematics	Reference to Standard 4 Science	Reference to Standard 4 Science
			(Key Idea)	Module	(Key Idea)	Physical Setting	Living Environment
1–9, 40	1	MC	1	T–3, 6, 10	1, 2, 4, 5, 7	2, 3, 4, 5	1, 2, 4, 7
10–20	1	MC	2	T–2, 6, 7	2, 4, 5, 7	3, 4, 5	1
21–26	1	MC	3	T–1, 8	2, 3, 4, 5	1, 3, 4, 5	5
27–29	1	MC	4	T–4, 8, 10	1, 2, 3, 4, 5, 7	1, 2, 3, 4, 5	1, 4, 5, 7
30–33	1	MC	5	T–1	2, 3, 4, 5	1, 3, 4, 5	—
34–36	1	MC	6	T–1, 5, 9	2, 3, 4, 5	1, 2, 3, 4, 5, 6	4, 5, 6, 7
37–39	1	MC	7	T–2, 9	2, 4, 5, 6	3, 4	4, 5, 6, 7
41	2	ER	1	T–3, 6, 10	1, 2, 4, 5, 7	2, 3, 4, 5	1, 2, 4, 7
42	3	ER	2	T–2, 6, 7	2, 4, 5, 7	3, 4, 5	1
43	4	ER	3	T–1, 8	2, 3, 4, 5	1, 3, 4, 5	5
44	2	ER	4	T–4, 8, 10	1, 2, 3, 4, 5, 7	1, 2, 3, 4, 5	1, 4, 5, 7
45	3	ER	5	T–1	2, 3, 4, 5	1, 3, 4, 5	—
46	3	ER	6	T–1, 5, 9	2, 3, 4, 5	1, 2, 3, 4, 5, 6	4, 5, 6, 7
47	4	ER	7	T–2, 9	2, 4, 5, 6	3, 4	4, 5, 6, 7

* MC = multiple choice

ER = extended-response question

**FORM D
WORKSHEET 1**

Class No. _____

D

**INDIVIDUAL CLASS WORKSHEET — Technology Education
Item Difficulty — Multiple-Choice Items (Part 1)**

Directions:

1. Make a copy of this worksheet for each class. Spaces are provided for 30 students.
2. Record the Class No. in the space at the top right.
3. Record in the box below the total number of students in the class who took the test.
4. Spread a convenient number of corrected answer sheets (6-10) side by side across a table so that an entire response column is visible for each answer sheet and each row is aligned. Tally the number of incorrect or blank responses for each item.
5. Continue to spread out answer sheets and tally the number of incorrect or blank responses until all answer sheets have been tallied.
6. Determine and record the number of correct responses for each item.
Use this formula: No. of Students – Total No. of Incorrect or Blank Responses
7. Transfer the number of students and the number of correct responses for each item to Worksheet 2.

--

No. of Students

Item #	Total No. of Incorrect or Blank Responses	Total No. of Correct Responses
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		

Item #	Total No. of Incorrect or Blank Responses	Total No. of Correct Responses
21		
22		
23		
24		
25		
26		
27		
28		
29		
30		
31		
32		
33		
34		
35		
36		
37		
38		
39		
40		

FORM D
WORKSHEET 2

Building/District Name _____

D

BUILDING/DISTRICT WORKSHEET — Technology Education
Item Difficulty — Multiple-Choice Items (Part I)

Directions:

1. From Worksheet 1 for each class, record in the shaded area the number of students who took the test. Complete the column for each class by recording the number of correct responses for each item.
2. Total the rows to determine the total number of students and the total number of correct responses to each item.
3. For each item, determine and record the item difficulty using the row totals.
Use this formula: $(\text{Total Number of Correct Responses} / \text{Total Number of Students}) \times 100$
4. Transfer the item difficulty for each item to the Local Difficulty column on Worksheet 5.

Item Number	Class and Number of Students										Row Totals	Item Difficulty	
	1	2	3	4	5	6	7	8	9	10			
1													
2													
3													
4													
5													
6													
7													
8													
9													
10													
11													
12													
13													
14													
15													
16													
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27													
28													
29													
30													
31													
32													
33													
34													
35													
36													
37													
38													
39													
40													

**FORM D
WORKSHEET 3**

Class No. _____

D

**INDIVIDUAL CLASS WORKSHEET — Technology Education
Item Difficulty — Extended Response Items (Part II)**

Directions:

1. Make a copy of this worksheet for each class. Spaces are provided for 30 students.
2. Record the Class No. in the space at the top right.
3. Record in the box below the total number of students in the class who took the test.
4. From each student's test booklet, record in the appropriate column the student's score for each extended-response item.
5. Total each item column to determine the total class score for each item.
6. Transfer the number of students and the total class score for each item to Worksheet 4.

--

No. of Students

Student Scores for Open-ended Items (Part II)

Student	Item Number						
	41	42	43	44	45	46	47
1							
2							
3							
4							
5							
6							
7							
8							
9							
10							
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							
21							
22							
23							
24							
25							
26							
27							
28							
29							
30							
Total Class Score							

**BUILDING/DISTRICT WORKSHEET — Technology Education
Item Difficulty — Extended-Response Items (Part II)**

Directions:

1. From Worksheet 3 for each class, record in the shaded area the number of students who took the test. Complete the column for each class by recording the total class score for each item.
2. Total the rows to determine the total number of students and the total score for each item.
3. Determine the mean score for each item using the row totals (round to the nearest .01).
Use this formula: $(\text{Row Total for Item} / \text{Total Number of Students})$
4. Record this mean score in the column indicated on this worksheet *and* on Worksheet 5.
5. Convert the mean item score for each item to an item difficulty (round to the nearest whole number).
Use this formula: $[(\text{Mean Item Score} / \text{Maximum Item Score}) \times 100]$
6. Transfer each item difficulty to the Local Difficulty column on Worksheet 5.

	Item Number	Class and Number of Students										Row Totals	Mean Item Score	Max Item Score	Item Difficulty
		1	2	3	4	5	6	7	8	9	10				
Total Class Score for Each Extended-Response Item in Part II	41													2	
	42													3	
	43													4	
	44													2	
	45													3	
	46													3	
	47													4	

**FORM D
WORKSHEET 5**

Building/District Name _____

D

**SUMMARY SHEET — Technology Education
Item Difficulty for Individual Test Items**

Directions:

1. Transfer local difficulties to this sheet from Worksheets 2 and 4.
2. Calculate and record the mean score for each block of multiple-choice (MC) items.
Use this formula: (Total of Item Difficulties / 100)
3. Transfer mean scores for the extended-response items (ER) to this sheet from Worksheet 4.

Item #	Item Type	Reference to Standard 5	Local Difficulty	Mean Score
		Technology (Key Ideas)		
1	MC	1		
2	MC	1		
3	MC	1		
4	MC	1		
5	MC	1		
6	MC	1		
7	MC	1		
8	MC	1		
9	MC	1		
40	MC	1		
10	MC	2		
11	MC	2		
12	MC	2		
13	MC	2		
14	MC	2		
15	MC	2		
16	MC	2		
17	MC	2		
18	MC	2		
19	MC	2		
20	MC	2		

Item #	Item Type	Reference to Standard 5	Local Difficulty	Mean Score
		Technology (Key Ideas)		
21	MC	3		
22	MC	3		
23	MC	3		
24	MC	3		
25	MC	3		
26	MC	3		
27	MC	4		
28	MC	4		
29	MC	4		
30	MC	5		
31	MC	5		
32	MC	5		
33	MC	5		
34	MC	6		
35	MC	6		
36	MC	6		
37	MC	7		
38	MC	7		
39	MC	7		
41	ER	1		
42	ER	2		
43	ER	3		
44	ER	4		
45	ER	5		
46	ER	6		
47	ER	7		

Note: If your school has item analysis done electronically, record the item difficulty for each item on this worksheet. Then follow step 2 above for the multiple-choice items 1–40.

For step 3, you may need to determine the mean score for items 41–47 if this value is not provided in your item analysis. This score can be calculated by multiplying the item difficulty by the maximum number of points for the item and dividing by 100.

Use this formula: (Item Difficulty x Max Points) / 100

**FORM D
WORKSHEET 6**

Building/District Name _____

D

**SUMMARY SHEET — Technology Education
School Scores for Key Ideas in Standard 5**

Directions:

1. *a.* From Worksheet 5, add the mean scores for the items listed in column 2 for each key idea.
b. Record the total in the column labeled School Score for Key Idea.
2. *a.* Look at the score range provided in the Scores Above Cut Point column.
b. If the School Score for Key Idea falls in the range given, circle the range.
c. List the key idea in the Program Strengths column in Worksheet 7.
3. *a.* Look at the score range provided in the Scores Below Cut Point column.
b. If the School Score for Key Idea falls in the range given, circle the range.
c. List the key idea in the Program Weaknesses column in Worksheet 7.

Items Grouped by Key Idea in Learning Standard 5

Key Idea	Item Numbers	School Score for Key Idea	Scores Above Cut Point for Key Idea	Scores Below Cut Point for Key Idea
1. Engineering Design	1–9, 40, 41		9–12	0–8
2. Tools, Resources, and Technological Processes	10–20, 42		12–14	0–11
3. Computer Technology	21–26, 43		8–10	0–7
4. Systems	27–29, 44		4–5	0–3
5. History and Evolution of Technology	30–33, 45		6–7	0–5
6. Impacts of Technology	34–36, 46		5–6	0–4
7. Management of Technology	37–39, 47		6–7	0–5

PROGRAM STRENGTHS AND WEAKNESSES — Technology Education

Program Strengths		Program Weaknesses	
Key Idea in Standard 5	Reference to Syllabus and/or Standards 3 and 4 (see page 39)	Key Idea in Standard 5	Reference to Syllabus and/or Standards 3 and 4 (see page 39)

APPENDIX E

Instructions for Submitting Program Evaluation Data Intermediate-Level Technology Education

In order to provide feedback and make recommendations to school districts, the Office of Curriculum and Instruction is collecting data from programs statewide. This data will represent aggregated student scores by key idea area as found on Worksheet 6. To contribute to this data collection effort, complete the form on the following page and fax it to Eric Suhr at 518-473-4884.

An alternative is to complete the data form provided on the State Education Department web site at <http://www.nysed.gov/ciai/mst/form.htm>. Your data will be added to other school scores to form a current picture of the intermediate-level technology education program in New York State. ***No individual school districts will be identified in this data.*** We hope you will take advantage of this opportunity to add to the data collected to provide a more accurate analysis of technology education at this level.

Steps for Submitting Data

Please read these instructions prior to entering data so that you will know which information or documents are needed.

1. Fill in the complete form for each middle school building in your district. Fill in all of the information requested. You can find the BEDS Code numbers on the packing slip sent with the assessment. This is a unique, 12-digit number that identifies each specific building in your district.
2. Enter the average score you arrived at for each compiled key idea from Worksheet 6.
3. Enter the Final School Score from the chart in Appendix A, B, C, or D. (You must first determine the School Raw Score by finding the average of all individual student scores.)
4. Choose the description that identifies the predominant delivery model for your school building from the choices provided. If you do not know, select "unknown."
5. Give the total number of students who actually took the assessment in your building, as well as the total number of males and of females.
6. Before you fax, make sure all your entries are correct to the best of your knowledge.
7. Fax completed forms to the attention of Eric Suhr at 518-473-4884.

If you have questions or comments related to the assessment or data collection, e-mail:
esuhr@mail.nysed.gov.



Intermediate Technology Education Assessment Data
Fax to 518-473-4884

1. Please enter the data separately for *each* of your school buildings on this form.

Person completing form	BEDS Code (12 Digits) _____
<input type="checkbox"/> Administrator	School District Building Name _____
<input type="checkbox"/> Teacher	Contact Name _____
<input type="checkbox"/> Other	Contact Phone _____

2. Circle the form for which you are submitting data **Form A** **Form B** **Form C** **Form D**

3. Enter your School Score for each of the seven key idea areas (from Worksheet 6)

<input type="text"/>	1. Engineering Design
<input type="text"/>	2. Tools, Resources, and Technological Processes
<input type="text"/>	3. Computer Technology
<input type="text"/>	4. Technological Systems
<input type="text"/>	5. History and Evolution of Technology
<input type="text"/>	6. Impacts of Technology
<input type="text"/>	7. Management of Technology

3. Enter your Final School Score

4. Check your school's predominant delivery model

- A — Whole unit of study in 8th grade
- B — Whole unit of study in 7th grade
- C — One half unit in 7th grade and one half unit in 8th grade, finishing in June of 8th grade
- D — One half unit in 7th grade and one half unit in 8th grade, finishing in January of 8th grade
- E — Split between 6th, 7th, and 8th grades in not less than 10-week blocks
- F — Other configuration
- Not Known

5. Enter date the test was administered

6. Enter total number of students who took the test

7. Enter breakout by gender Male Female